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**OVERSIGHT REVIEW OF  
INFRASTRUCTURE NEEDS AND  
PROJECTS READY FOR IMMEDIATE  
IMPLEMENTATION IN THE NUCLEAR  
SECURITY ENTERPRISE**

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HEARING

BEFORE THE

SUBCOMMITTEE ON OVERSIGHT  
AND INVESTIGATIONS

OF THE

COMMITTEE ON ARMED SERVICES  
HOUSE OF REPRESENTATIVES

ONE HUNDRED FIFTEENTH CONGRESS

FIRST SESSION

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HOUSE OF REPRESENTATIVES,  
COMMITTEE ON ARMED SERVICES,  
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS,  
*Washington, DC, Thursday, March 16, 2017.*

The subcommittee met, pursuant to call, at 2:21 p.m., in room 2212, Rayburn House Office Building, Hon. Vicky Hartzler (chairwoman of the subcommittee) presiding.

**OPENING STATEMENT OF HON. VICKY HARTZLER, A REPRESENTATIVE FROM MISSOURI, CHAIRWOMAN, SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS**

Mrs. HARTZLER. Good afternoon. This hearing will come to order. I appreciate everyone's patience during vote series. I know we are getting started a little late. But in connection with today's hearing, I welcome the members of the full committee who are not permanent members of the subcommittee who are or will be attending.

I also want to recognize and thank the distinguished gentleman from Alabama, Chairman Rogers of the Strategic Forces Subcommittee, for attending this hearing.

I ask unanimous consent that these committee members be permitted to participate in this hearing, with the understanding that all sitting subcommittee members will be recognized for questions prior to those not assigned to the subcommittee.

Without objection, so ordered.

Many of the buildings, facilities, and laboratories of the U.S. nuclear weapons enterprise were constructed over 65 years ago, in the 1940s and 1950s. These facilities currently have a backlog of deferred essential repairs, rehabilitation, and replacement construction totaling \$3.7 billion. Infrastructure needs at this magnitude, if not addressed, threaten both the mission of the National Nuclear Security Administration, or NNSA, its labs and facilities, as well as the safety of its workers.

The House Armed Services Committee has made NNSA infrastructure needs a high priority in recent years. The committee has previously authorized substantial increases in funding over Presidents' past budget requests. However, not until last year did the NNSA, under the direction of the last Secretary of Energy, halt growth in the deferred maintenance backlog. This is an important first step, because as the old saying goes, once you are in a hole, stop digging.

The funding challenges for the nuclear enterprise infrastructure are twofold. We need to keep the current infrastructure from dete-

riorating further. This is an expensive proposition, especially when we must also support day-to-day funding requirements. And we also need to provide additional funding to start chipping away at the massive infrastructure backlog.

We also need to look at policy, regulation, or statute changes that can be implemented. We can do this without sacrificing critical congressional oversight or for those that supervise projects within NNSA.

There is an above-threshold reprogramming limit of \$5 million and a general plant and projects, or GPP, limit of \$10 million. We need to consider if such limits are still relevant in today's fiscal environment. Perhaps they can be modified to more effectively and efficiently implement and oversee infrastructure projects.

Finally, we need to establish and maintain a transparent and open dialogue about which funding mechanisms are most appropriately utilized. It is possible to exercise the normal line item authorization and appropriations process or use third-party, public-private partnership financing arrangements.

Now, regardless of funding mechanisms, we need to ensure that construction and recapitalization initiatives are not plagued with major cost overruns and scope underruns that many of NNSA's large line item projects in the past have experienced.

An exemplary model project not on the bad list, and one that was well implemented using third-party, public-private partnership financing, is one that I don't mind sharing about from my home State of Missouri. The Kansas City National Security Campus project enabled rapid replacement of the previous dilapidated facility that was housed in a former World War II-era Navy aircraft engine manufacturing plant built in 1942.

In addressing the Kansas City infrastructure project, NNSA and the General Services Administration competitively selected Center-Point Zimmer, a private developer, to replace the 70-year-old Bannister Federal Complex. The 20-year lease on the new facilities not only provides a flexible, responsive infrastructure that helps attract top talent, but also saves the taxpayer over \$150 million annually in lower facility maintenance, energy, and other costs. Additionally, this project was completed ahead of schedule and under budget. Now the outstanding and professional workforce at the Kansas City campus today has a modern, clean, and safe environment in which to conduct their vital and unique work for our nuclear enterprise.

This is the standard that we should all hope to achieve for our skilled and dedicated professionals throughout the entire nuclear enterprise if we hope to recruit, train, and retain the best of the best our scientific and engineering community has to offer.

So I look forward to discussing the infrastructure needs of the enterprise with our distinguished panel of witnesses we have before us today. But before I introduce the witnesses, I turn to Representative O'Halleran, sitting in for the subcommittee ranking member, for any opening remarks that he would like to make.

[The prepared statement of Mrs. Hartzler can be found in the Appendix on page 31.]

**STATEMENT OF HON. TOM O'HALLERAN, A REPRESENTATIVE  
FROM ARIZONA, SUBCOMMITTEE ON OVERSIGHT AND IN-  
VESTIGATIONS**

Mr. O'HALLERAN. Thank you, Madam Chairwoman.

I would like to thank you, our witnesses, for appearing before this panel today.

Today, our nuclear weapons enterprise is at a crossroads as we begin to make the first major payouts on a nuclear recapitalization program that is expected to cost over \$1 trillion over 30 years.

As we do this, the Department of Energy, via the National Nuclear Security Administration, is focusing extensively on efforts to design and build new weapons systems and new nuclear facilities. Reasonable investments in our nuclear deterrent are essential, but I would caution that we should be wary of doing all of this at the expense of adequate maintenance for our existing nuclear labs and infrastructure.

When we discuss crumbling ceilings and flooded hallways at our nuclear facilities today, I encourage us to ask not just can we build a brand-new building to replace these facilities and how will we find the money, but also, how did we get to this point, and are there smart practices and proper incentives that we could have adopted so that this maintenance breakdown could have been avoided?

I am concerned that there may be ingrained patterns of safety and budget practice at the NNSA that do not adequately prioritize maintenance over our programmatic requests. These maintenance problems are quite alarming when you consider that proper maintenance in these facilities jeopardizes the morale and safety of our nuclear workforce and poses the risk of a dangerous nuclear accident.

Many of the facilities we are talking about here are old, but for a frame of reference, these facilities are comparable to many run by the Navy's Naval Reactors office, which are also the same age, yet the facilities run by the Naval Reactors are in excellent shape and their safety records are stellar, because the Naval Reactors applies different maintenance and safety procedures and tripwires.

Nearly 60 percent of Naval Reactors facilities are 50 to 70 years old, but they are in much better repair. That suggests that we could be doing prioritization, maintenance, and safety better.

In the current budget environment, we can't afford for our nuclear enterprise to be governed by inertia and the ways of the past.

Thank you, Madam Chair.

Mrs. HARTZLER. Thank you, Mr. O'Halleran.

So I am pleased to recognize our witnesses today, and I want to thank them for taking the time to be with us. We have the Honorable Frank Klotz, the administrator of the National Nuclear Security Administration and retired Air Force lieutenant general. We have Mr. James McConnell, associate administrator at the National Nuclear Security Administration for safety, infrastructure, and operations. We have Dr. Charlie McMillan, laboratory director at the Los Alamos National Laboratory. We have Ms. Michelle Reichert, deputy enterprise manager for Consolidated Nuclear Security, LLC, which oversees operations at the Pantex nuclear facility in Amarillo, Texas, and at the Y-12 nuclear complex in Oak

Ridge, Tennessee. And the Honorable Sean Sullivan, chairman of the Defense Nuclear Facilities Safety Board.

So thank you all for being with us today, and we will now hear your opening statements.

Administrator Klotz, my understanding is that you will be giving the opening statement for Mr. McConnell and yourself. So we will begin with you.

**STATEMENT OF LT GEN FRANK G. KLOTZ, USAF (RET.), ADMINISTRATOR, NATIONAL NUCLEAR SECURITY ADMINISTRATION, ACCOMPANIED BY JAMES J. McCONNELL, ASSOCIATE ADMINISTRATOR FOR SAFETY, INFRASTRUCTURE, AND OPERATIONS, NATIONAL NUCLEAR SECURITY ADMINISTRATION**

General KLOTZ. Thank you, Chairwoman Hartzler and Representative O'Halleran and other members of the committee and subcommittee. Thank you for the opportunity to discuss the challenges and progress made by the Department of Energy's National Nuclear Security Administration in improving the state of our infrastructure. We recognize the subcommittee and the committee's important oversight role and appreciate your willingness to highlight the importance of our critical national security missions.

As you said, I am pleased to be joined by Jim McConnell, who has the principal responsibility for safety, infrastructure, and operations within the NNSA headquarters. We have provided the subcommittee with a written statement and respectfully request that it be submitted for the record.

Let me emphasize at the outset that the success of the Nation's nuclear security enterprise and its workforce depends upon safe, reliable, and modern infrastructure at our laboratories, production plants, and other facilities. Unfortunately, as has already been pointed out, much of this infrastructure is antiquated, with many facilities dating back to the Eisenhower administration and in some cases even to the Manhattan Project era. As a result, our critical operations are subject to increasing risk, as is the physical safety of our people.

As we contend with this aging infrastructure, NNSA is presently busier than we have been in many, many years. We are currently conducting three warhead life extension programs and one major alteration to ensure the long-term health of our nuclear deterrent, in addition to our usual stockpile stewardship activities. This tempo of operations has put increased pressure on an already fragile infrastructure. This is also true for the Office of Naval Reactors, which over the past 10 years has had to increase resource allocation to support aging facilities.

Although the role of nuclear weapons in our national security strategy is widely understood and enjoys broad bipartisan support, the link between nuclear deterrence and the infrastructure that supports it is less appreciated. As I have stated before, before this committee and elsewhere, I can think of no greater threat to the national nuclear security enterprise than the state of NNSA's infrastructure. We are long overdue to build a modern, safe complex that will meet military requirements, keep the deterrent safe, secure, and effective, and enhance worker and public safety.

My written statement catalogues our many efforts to improve NNSA's infrastructure over the long-term by arresting the growth of deferred maintenance, gradually reducing it across the enterprise, disposing of excess facilities, and building new, modern facilities for our workforce where appropriate. It also describes our effort to ensure the long-term availability of the strategic materials associated with nuclear weapons—plutonium, uranium, tritium, lithium, and others—which are essential to the Nation's nuclear deterrent.

All of these activities are being more effectively and efficiently managed by employing new analytical and decision-making tools over the past few years. In particular, NNSA is making risk-informed management decisions using capabilities such as the Mission Dependency Index and BUILDER, which use hard data to evaluate assets and prioritize repair and investments.

Furthermore, improved contract and project management practices are providing clear lines of authority for managers, improving cost and schedule performance, and ensuring that the most qualified people are managing NNSA's work.

So, again, I appreciate this subcommittee's desire to draw attention to both our successes and to our challenges. With that, Jim and I look forward to answering any questions that you may have.

[The joint prepared statement of General Klotz and Mr. McConnell can be found in the Appendix on page 35.]

Mrs. HARTZLER. Thank you very much.

Dr. McMillan.

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

Dr. McMILLAN. Chairwoman Hartzler, Representative O'Halleran, members of the committee, members of the subcommittee, thank you for the invitation to come speak today.

Last fall in testimony, I said that the National Nuclear Security Administration's laboratory and plant infrastructure is the foundation that supports our Nation's nuclear weapons enterprise. I personally have devoted 34 years of my career to working in the weapons program, and based on that experience, I bring an understanding of the set of capabilities that are needed to ensure a safe, secure, and effective stockpile.

The current set of scientific tools that is used to manage the stockpile are available today because of decisions that Congress made over the last several decades. Those decisions were informed by a belief that scientific analysis was the best method to support the stockpile without additional nuclear testing. Your decisions today will help set the course for the future for us.

What are the essential features of our enterprise in 2030? 2030 is a date I think about a lot. I think they include modern facilities that will handle high explosives, hazardous materials, plutonium, tritium, uranium, lithium; and in addition, new scientific facilities, like the enhanced capability for subcritical experiments and others, that will be needed to qualify new materials and manufacturing processes before they are introduced into the stockpile.

Furthermore, we must not overlook the investments in the people who are the stewards of the stockpile when discussing infra-

structure. The ability to attract, educate, and retain the bright minds who make up our next generation of weapons scientists and engineers depends on your investments.

My written testimony focuses on three main areas: shovel-ready projects, plutonium infrastructure, and managing risk in order to eliminate hurdles.

The shovel-ready projects that I address are more tactical efforts that by themselves should not be expected to solve the longer-term strategic infrastructure issues that we face. A recent review that was led by Mr. McConnell detailed more than \$3 billion worth of needed investments across our enterprise, with about a third of those at Los Alamos. Many of these, though not all, are shovel-ready.

Our country currently has an extremely limited capability to manufacture plutonium pits. A government analysis of alternatives that is currently underway evaluates the construction of plutonium modules that would connect as extensions to the plutonium facility at Los Alamos. These modules are designed to provide two important capabilities: First, the ability to reach the military-required capacity of 50 to 80 pits made in a year; and second, to substantially reduce the risk that is associated with the operation of our plutonium facility.

In order to meet these goals that are currently set for toward the end of the 2020s, we have to take action and make decisions now.

As Chairwoman Hartzler mentioned in her opening comments, the laboratories and plants have used general plant projects, or GPP, as an efficient way to address modest-scale infrastructure needs. One way to reduce hurdles would be to raise the GPP limit, and based on my conversations with my fellow lab directors, we believe \$30 million would be a good target to aim for, and then to index that to inflation.

Finally, on the subject of risk. Risk is inherent to laboratory and plant operations. Past practice has led many government managers as well as laboratory managers to be extremely risk averse. Risks can only be managed; they cannot be eliminated. Well-managed risk enables mission.

Thank you for the opportunity to testify today, and I welcome your questions.

[The prepared statement of Dr. McMillan can be found in the Appendix on page 44.]

Mrs. HARTZLER. Thank you very much, Dr. McMillan.

Ms. Reichert.

**STATEMENT OF MICHELLE REICHERT, DEPUTY ENTERPRISE  
MANAGER, CONSOLIDATED NUCLEAR SECURITY, LLC**

Ms. REICHERT. Chairwoman Hartzler, Representative O'Halleran, Representative Rogers, and members of the subcommittee, thank you for the opportunity to speak with you today about the infrastructure and deferred maintenance challenges facing the production plants and the laboratories that make up our nuclear security enterprise; more close to home for me, the Pantex Plant in Amarillo, Texas, and the Y-12 National Security Complex in Oak Ridge, Tennessee.

First, I would like to thank the committee for its longstanding support. The patriotic men and women that work at Pantex and Y-12 are grateful for the committee's steadfast commitment to maintaining our nuclear deterrent. I would personally like to thank and express my appreciation to all of you for continuing to shine a light on this very important issue.

Our dedicated employees at both sites diligently plan and work to maintain our production facilities in a safe and secure working environment, but the effort necessary to sustain our capabilities continues to grow. What we do at Pantex and at Y-12 doesn't always get a lot of attention, but the work we do every day is vital to the ongoing security of our Nation and her allies.

Much of that work takes place in buildings that helped win World War II and the Cold War, but the march of time has certainly taken its toll on these facilities. Many of our employees continue to experience roofs that leak onto their workspaces, inadequate heating and air conditioning systems, routine encounters with rodents and even snakes in their work environment. They deserve so much more.

We have approximately \$800 million of deferred maintenance currently on our books between Pantex and Y-12. Given the current pace of funding, erasing that backlog will be impossible, and we experience issues that affect production every day as a result.

I do not, however, want you to think we are sitting idly by. Along with eliminating excess and deteriorating facilities, we are embarking on the largest set of capital construction projects at both sites seen in decades. Through third-party financing, a new administrative support complex is being built at Pantex. It will provide state-of-the-art workspace for 1,100 workers and improve recruiting and retention efforts. We also recently finished construction on a new High Explosive Pressing Facility at Pantex, and at Y-12 the Uranium Processing Facility project is well underway.

With an appropriate investment, we could accelerate efforts to reduce the deferred maintenance backlog at both sites by moving forward on a broad complement of near-term efforts, ranging from capital construction to new roofs, replacement of our HVAC [heating, ventilation, and air conditioning] equipment, installation of new electrical equipment. Each of those projects would help us reduce the risks to our workers and to our mission.

Near-term funding, combined with long-term recapitalization, aggressive disposition of our excess facilities, and increased utilization of additional funding approaches, as discussed already by my colleague, is necessary to preserve the mission work that occurs at our sites. Such an approach is essential to ensuring the safety of our workforce and essential to keeping Pantex and Y-12 on track to provide a safe, secure, and effective nuclear deterrent for our Nation.

Again, thank you for the opportunity to speak to you today.

[The prepared statement of Ms. Reichert can be found in the Appendix on page 52.]

Mrs. HARTZLER. Thank you, Ms. Reichert.

Mr. Sullivan.

**STATEMENT OF HON. SEAN SULLIVAN, CHAIRMAN, NUCLEAR  
DEFENSE FACILITIES SAFETY BOARD**

Mr. SULLIVAN. Chairwoman Hartzler and distinguished members of this committee and subcommittee, it is an honor to be before you today as chairman of the Defense Nuclear Facilities Safety Board to share my observations on the challenges and actions associated with the aging infrastructure within the Department of Energy's defense nuclear facilities complex.

I have submitted a written statement, and respectfully request that it be included in the record.

Mrs. HARTZLER. So ordered.

Mr. SULLIVAN. The Board is responsible by statute for the independent oversight of all programs and activities impacting the adequate protection of the public health and safety within DOE's [Department of Energy's] defense nuclear facilities. The Board is statutorily mandated to review the content and implementation of the DOE's standards, facilities and systems design, and events and practices at DOE defense nuclear facilities.

As my fellow panelists have shared, many NNSA facilities are very old. Aging defense nuclear facilities present several potential safety problems that must be simultaneously managed. Systems degrade with time. The risks associated with radiological holdup within a facility increase with time. Waste streams with no defined disposition path may accumulate with time. Replacement parts for critical systems become unavailable as manufacturers go out of business or the technology becomes obsolete. And new or evolving missions require existing facilities to be used in ways for which they were not initially designed.

To mitigate these issues, NNSA prioritizes maintenance at high-risk defense nuclear facilities, and within each facility NNSA prioritizes maintenance on safety class and safety-significant equipment and components. Nevertheless, many of these defense nuclear facilities are past or are approaching the end of their design life.

Additionally, nondefense nuclear facilities, that is, NNSA facilities that do not contain special nuclear material, generally do have significant maintenance backlogs, and an accident, such as a major fire in one of those facilities, could pose a risk to nearby defense nuclear facilities.

Many NNSA sites also have significant aging issues with critical site infrastructure, such as in-ground water pipes and overhead electrical transmission lines. Finally, aging infrastructure has a hard-to-quantify, but no less real, negative impact on human capital.

For the Board in its role as an independent executive branch agency advising the Secretary of Energy on nuclear safety, the sheer number of issues posed by aging infrastructure is cause for concern. To the extent that a specific failure at a specific place can be anticipated, NNSA has demonstrated that appropriate action will be taken, but the risk of a significant unanticipated failure continues to increase with time.

The written testimony I have submitted to this subcommittee contains several detailed examples of potential safety problems caused by aging infrastructure as well as some positive observations on existing NNSA programs to manage these safety risks.

I look forward to answering any questions you may have. Thank you.

[The prepared statement of Mr. Sullivan can be found in the Appendix on page 60.]

Mrs. HARTZLER. Thank you very much, Mr. Sullivan.

Dr. McMillan, I wanted to start with you with a few questions. You shared about reference to my opening remarks about the GPP and said that you thought, visiting with colleagues, it should be raised to \$30 million, would give you more flexibility. Can you clarify that? Because I understand it was \$5 million for the above-threshold reprogramming, and then general plant and projects, a limit of \$10 million. So which one are you saying should be \$30 million raised?

Dr. MCMILLAN. It is the general plant projects.

Mrs. HARTZLER. Okay.

Dr. MCMILLAN. And, Chairwoman, the logic there is as follows. Particularly in California, since the last time the GPP limit was raised, we have seen substantial increases in construction costs. It is true across the country, but both my colleagues at Lawrence Livermore and Sandia have facilities in California where that has been particularly steep.

In addition, as we look at issues like efficiency for the buildings, being able to build somewhat larger buildings allows us to have greater energy efficiency, better space efficiency in terms of how much is occupied by hallways rather than offices and labs.

So having a higher limit allows us to more efficiently use that money.

Mrs. HARTZLER. Great. And do you have any recommendation for the funding reallocation limits related to the interagency above-threshold reprograms, which is now \$5 million?

Dr. MCMILLAN. I don't have specifics, but I would like to defer to my NNSA colleagues on that, because they tend to be the ones who have to deal with those issues.

Mrs. HARTZLER. Sure.

Administrator Klotz.

General KLOTZ. Sure. Thank you very much for the question.

Let me say, I have made it a point, as I have gone out to visit our laboratories and other sites, to see some of the GPP projects that are out there. In fact, on one of my last visits to Los Alamos, Dr. McMillan took me over to view a facility that they had just recently completed. And I must say, I was very impressed, one, with the quality of the work that was done, and secondly, its impact on the morale of the employees that work in that particular facility.

We hire the absolute best and brightest to be our laboratory and plant directors and the key personnel in each of those facilities. I am certainly willing, as the Administrator, to give them more discretion and more leeway in terms of the decisions that they would make in terms of what they would do for general purpose projects.

We have a healthy discussion between us and all of our sites as they contemplate these kinds of projects to decide what is the best way to get at it. One shoe does not fit all. And I think what we really need are a lot of different shoes or tools, to mix a metaphor, in our toolkit to deal with some of the infrastructure issues that we have, ranging from line item capital construction projects of a

more traditional nature, to any number of different types of third-party financing schemes, to things like the GPP, as a way of getting at this issue.

So from the NNSA perspective, we are very supportive of what the laboratory directors and plant directors have told us repeatedly that would help them help us in terms of maintaining those sites.

Mrs. HARTZLER. Do you have a dollar amount that you would recommend, though, for the increase on the first, the interagency above-threshold reprogramming account?

Mr. MCCONNELL. I believe that the \$10 million threshold, exactly as Dr. McMillan said, has come to be a problem where projects of—

Mrs. HARTZLER. Okay. Well—

Mr. MCCONNELL [continuing]. Equal complexity this year—

Mrs. HARTZLER. Maybe there is a—

Mr. MCCONNELL. Is this the minor—

Dr. McMILLAN. This is the \$5 million—

Mr. MCCONNELL. Oh.

Mrs. HARTZLER. Yes. So there are two different funds, one has a \$5 million threshold, one has 10. I think we have fully explored that the \$10 million should be raised to \$30 million, but my question is about the \$5 million—

Mr. MCCONNELL. Oh, reprogramming.

Mrs. HARTZLER [continuing]. Should it be increased, and if so, how much?

Mr. MCCONNELL. Can I add one other element to that first, because one other issue is the structure of the budget, because if you have—if you raise the budget thresholds for, for example—I will get into a couple of details here—to combine previous control points, then there is the ability to move money within the account as necessary to address issues without requiring any reprogramming at all.

In the last couple of years, the Congress and your committee have helped us to restructure our budget such that we have three major infrastructure and operations control points that allow us to then do maintenance as a single entity across the enterprise, do recapitalization as a single budget line across the enterprise, and therefore inherent in that is the flexibility to move money between one lab that is having a problem and another lab that for some reason doesn't.

This year in particular, the Congress has looked at combining our operations at facilities control points, which are currently eight specific unique control points, one for each plant or site, into a single amount, that would allow the flexibility to move those operating dollars to wherever the needs are within our enterprise.

So without perhaps deferring to the Administrator on a level for reprogramming, I would recommend that that current idea to combine the ops at facilities control points into one more flexible element would be an element that could help us solve this problem.

Mrs. HARTZLER. Flexibility sounds good if you are able to combine.

Before we move on, anything you want to say, Administrator?

General KLOTZ. That is exactly what I was going to say, Congresswoman. Flexibility is good.

Mrs. HARTZLER. Yeah.

Dr. McMILLAN. If I could maybe add, based on the comments that my head of operations has provided since my earlier statement, he suggests that if we were to go to \$10 million, it would give us quite a bit more flexibility, as General Klotz—

Mrs. HARTZLER. Ten million on that first account, \$30 million on it.

Dr. McMILLAN. Correct.

Mrs. HARTZLER. Okay. Thank you.

And if we did raise those limits, how would you foster the relationship with oversight committees in Congress to ensure that we are still gaining the necessary insight into various projects so that we can conduct proper oversight of NNSA's spending of our taxpayer dollars?

Dr. McMILLAN. I am happy to start with that, Chairwoman.

One of the things that we do and I think we could certainly continue to do to ensure that oversight is provide reports both on the projects that we are doing as well as our progress on those projects. I am perfectly comfortable with the idea of transparency as a mechanism for oversight.

What gives us difficulty is if there is a very elaborate decision-making process that goes with these, I call them medium-scale projects. So transparency is something we can very easily provide that I think can help your committee with that kind of insight.

Mrs. HARTZLER. Okay. So this is a recommendation to change it. The policy—are there any other statutes, regulations, or policies that would impede immediate implementation of the projects that you would consider shovel ready for immediate implementation?

Dr. McMILLAN. Yes.

Mrs. HARTZLER. What are some of those things?

Dr. McMILLAN. An example of a practice or policy, I am not quite sure where it fits, is the requirement that we destroy and decommission a building in the same year that we build the new building. It makes perfect sense to me that we should take down old facilities and be held accountable for that. The logic is when we take down an old building, we get rid of the maintenance costs associated with that, and that can then go into a new building.

However, we would very much like to be able to bank that space when we—take it down as soon as we can, as soon as we can afford it. And then we may not be able to afford to put up new space in that year, but a year or two later draw from that bank of space so that we can then—so that would help us a lot.

Mrs. HARTZLER. Okay. Ms. Reichert, do you have—

Ms. REICHERT. I think from our plant's perspective, as well as allowing funding for us to take down the facilities, not process-related facilities that aren't contaminated, allowing some budget flexibility to do that, because we are investing a lot of money right now in facilities we no longer need. And the more efficient we become at the sites, the more we can invest in the critical infrastructure that we are maintaining for the long term.

We don't do much of that now, but we have in the past, and I think that would help all of us, both the labs and the plants, to have that flexibility within the budget to bring more of those

projects to fruition. And we do seek to do that in the out-years to make us more efficient.

Mrs. HARTZLER. Great.

Any other change in policies that you would recommend, Administrator Klotz or—

General KLOTZ. Well, one that we have talked to other members of the committee about in the past is clearly more flexibility in how we use third-party financing related to doing construction. You have already mentioned, and, of course, we have pictures, I think on page 6 is the Kansas City National Security Campus that you spoke about. That was built, as you mentioned, through a GSA [General Services Administration] lease with a third-party developer.

We are also—again, great support from the committee—we are also in the process of building a facility at Amarillo, in fact, that is on page 9 of the slides which we provided, an Administrative Support Complex which will allow roughly a third of the Pantex workforce to get out of 1950s-era buildings into a modern, efficient building to do their work. That also is third-party financed. GSA was not part of that. This was a straight contract between Michelle Reichert's people, who have responsibility for operating and managing Pantex and Y-12 for us, and a private developer.

[The slides referred to are retained in committee files and can be viewed upon request.]

General KLOTZ. I approved the mission need for this particular site in early 2015, and Michelle and her people are going to occupy it in early 2018. That is 3 years. That is a lot faster, much, much faster than we would have been able to do if it had been a line item construction project in which we would have had to come over probably a series of a couple legislative sessions in order to request the funding for it.

So I think that is another area where more flexibility for us is something that we have certainly advocated and would continue to advocate.

Mrs. HARTZLER. It sounds like you have already got that flexibility, though, because you have been able to complete these two projects.

General KLOTZ. There are two, but there are other projects we would have done. And I will probably get in a lot of trouble with my executive branch colleagues, but I will tell you, it was exceedingly challenging work over a period of about 16 months in order to secure the approval—to secure authority to give approval to the M&O [management and operating] contractor to go ahead and enter into this lease. So some streamlining there would be very, very helpful.

And there are other projects which we would like to do, which, quite frankly, don't meet the scoring requirements, not just for the Office of Management and Budget, but also for the Congressional Budget Office. So there is where I think we need more flexibility.

Ms. REICHERT. I think lease scoring changes is a big impediment to a lot of the projects that are being looked at right now, and a firmer policy on alternative financing as being a viable approach. As General Klotz mentioned, it wasn't worth—wasn't without con-

siderable effort over a long period of time to make the Administrative Support Complex a reality.

Dr. MCMILLAN. And if I could also support General Klotz in the statement about difficulty. My colleagues at Livermore and Sandia have projects that they have been working on for years in the third-party finance domain without success. It is a process that, while we have successes, and I applaud those successes, it is sort of beyond difficult right now.

The other addition, and Michelle mentioned it, is effective use of lease space, lease scoring. While we certainly don't want all of our facilities to be leased facilities, there are times when that can be a very cost-effective way to either buffer changes in facilities, deal with peak loads, those kinds of things. And, again, if we had policies that made that easier for us to use in a responsible way, it would be very valuable.

Mrs. HARTZLER. I want to make sure my colleagues have a chance to ask their questions, so I will come back with some others. But would it be possible for each of you to put in writing to us suggested changes in policy that would be helpful to expedite these projects?

Dr. MCMILLAN. These were included—

Mrs. HARTZLER. We have been taking notes here, but, you know, this would be something that we could actually move forward with legislation, and be helpful to have it in writing.

Dr. MCMILLAN. All of these are in my written testimony.

Mrs. HARTZLER. Okay.

Ms. REICHERT. Mine as well.

Mrs. HARTZLER. Okay. Very good. We will glean those out. Thank you very much.

Mr. Scott.

Sure. Mr. Suozzi. Sorry.

Mr. SUOZZI. Suozzi.

Mrs. HARTZLER. Suozzi.

Mr. SUOZZI. Good afternoon. My name is Tom Suozzi. I am a freshman Congressman. This is all brand-new to me, this topic. I want to first say that it is obvious that you do very, very important work, and probably don't get very much attention, considering how important it is, and I recognize what a challenge it has been for you.

My former public service career was as mayor of my home town and county executive of a large county. I had a \$2.8 billion budget, larger than 16 States. And my county grew rapidly from the 1940s through the 1960s to today. We went from 400,000 people in 1947 when Levittown was built to 1.2 million people in 1960, and it was the same type of growth that you probably saw in your operation during World War II and afterwards.

And when I look at these pictures, it is the exact same thing that I came into in my government, which is you had this sprawling enterprise that was pieced together over a period of time, and it kind of was just—you know, if you started from scratch, you would have never built all these different sprawling facilities. And nobody paid attention, and now all the buildings are falling apart. And you are scientists working on nuclear stuff, and you are not really probably as expert or as focused on maintenance and things like that.

So there are a couple different things that I would like to understand. And it is not going to happen today, but I would love to see some sort of report if it is done in some sort of comprehensive way.

There are four different ways that I think that you should be looking at, which it sounds like from your testimony that you are already doing this already. But number one is consolidation. What are you doing to take your eight major facilities, and I am sure there are lots of other facilities, what are you doing to reduce it? Are you reducing it to six? Are you reducing it to five? What are you doing to consolidate your operations? I don't expect you to answer this all now.

[The information referred to can be found in the Appendix on page 91.]

Mr. SUOZZI. But consolidation is probably one of the great things you can do, and maybe even sell your surplus property or give it away just to get rid of it or give it to some other government agency. And so that is number one, is consolidation and sale of surplus, elimination of surplus.

Number two is, you know, in the earlier statement from Congressman O'Halleran, which he is taking the place of the ranking member today, he talked about how the Navy does a good job with their maintenance, and you guys are—you know, they have old facilities, but you guys don't do as well. But they are big and you are, by comparison, small. You are not small, but by comparison you are small to them. And they have got, you know, a lot more depth and lot more funding and stuff like that.

Is there some way that you could collaborate with another Federal agency that maybe is good at doing these type of things, that they could help you to do some of this day-to-day stuff and figuring out some of this capital planning? Because you have got all your resources dedicated to the science and to nuclear issues, and maybe there is somebody else that has a much larger operations and maintenance and capital building background than you, that you could get the big guys to help the little guys and help you figure out how to do this stuff instead of you trying to recreate the wheel.

[The information referred to can be found in the Appendix on page 91.]

Mr. SUOZZI. It is like hospitals today. Hospitals can't survive by themselves because they have got too many areas of expertise, so they create these big networks, and instead of everybody trying to be expert at everything, you get one group is an expert at payroll, and this guy is an expert at cancer, this one is an expert at oncol—chiro—you know what I mean.

So one is consolidation, two is can you collaborate with other agencies.

Three is I am very interested in public-private partnerships [PPPs], and it seems like you are interested in that as well. And it would be great if, as part of a report, you would talk about your long-term vision for consolidation, collaboration, and public-private partnerships. What would be the projects you would want to focus on getting this private money in for, so that we could—I see these guys nod their head talking about how we should be doing more PPPs over here. You know, give us examples of it so we could help fight for you.

[The information referred to can be found in the Appendix on page 91.]

Mr. SUOZZI. And number four is, are there any other reforms, other than these numbers of \$10 million and \$30 million increases?

[The information referred to can be found in the Appendix on page 92.]

Mr. SUOZZI. But I think the best thing would be if your agency as a whole had a comprehensive plan, which maybe you have and I just haven't seen something like that, a comprehensive plan, this is our plan for the next 10 years as to how we are going to shrink our footprint, take care of it better in the future, collaborate with other people, save some money, and do things more efficiently.

So I know I went a little bit all over the place, but go ahead.

General KLOTZ. Can I dive just a little bit into that? And I really would welcome the opportunity to follow up over a series of visits and meetings to delve into this, because you raise extraordinarily important points.

On the point of consolidation, the overall nuclear security enterprise has contracted significantly since the end of the Cold War. We shut down Rocky Flats, where we made plutonium pits; we have closed Pinellas, where we made neutron generators; we used to do uranium enrichment at Paducah, Kentucky, and in Portsmouth, Ohio, and all that—

Mr. SUOZZI. Are these surplus, or the government still holds onto them and they are contaminated?

General KLOTZ. It depends on the specific site. Some, for instance, I believe Pinellas has been turned over to a local development authority, others are contaminated and we are still—we, I say we, the larger Department of Energy is involved in the decontamination process associated with that.

On the Naval Reactors, there is one point I think we should make, and that is Naval Reactors is a part of the NNSA wearing one hat; the other hat takes them back to the Navy. It is true that they have done an extraordinarily good job in terms of maintaining their facilities and building new facilities. I think they would also tell you that they are behind. You know, if you go back and poke around in the back of their facilities, there are a lot of issues there as well.

Mr. SUOZZI. Similar to yours?

General KLOTZ. Similar to us. And, in fact, we fund their recapitalization and their maintenance, so we are very aware of the issues they have and are very, very supportive of fixing the laboratories. In fact, the facilities where they operate are DOE-owned facilities.

Public-private partnership we have already talked about, but I am glad you raised working with other government agencies. We rely a lot on the U.S. Army Corps of Engineers in many of our projects, and they have been extraordinarily helpful in terms of design and in some cases actually being the build agent that would go out. They are very, very good on, you know, sort of general purposes, light laboratory, light industry types of work, and they even helped us out on some very specialized facilities associated with nuclear operations, which is not really their primary business.

So we are trying a lot of these as we are working to improve the way in which we do work. And as I said at the outset, I would be delighted to spend more time with you on that.

Mr. SUOZZI. Thank you so much.

Dr. McMILLAN. Congressman.

Mr. SUOZZI. Yes.

Dr. McMILLAN. If I could just add to what General Klotz said in a couple of regards. You ask are facilities being turned over. Rocky Flats Plant is an excellent example outside of Denver. It is now parkland. Okay.

So the consolidation for our enterprise really occurred during the 1990s at the end of the Cold War. So we have done that.

Something I would add is, you asked about whether we had plans. Something that Mr. McConnell has been leading is something that we call the Management Asset Plan, MAP. All of the sites are providing input into that. He has been doing reviews at all of the sites. And what we traditionally had as our 10-year site plans are now being rolled up to the whole NNSA level. So those plans are being built, they exist, and I think it is well worth taking a good look at that.

Ms. REICHERT. One other area I want to emphasize on consolidation as well, not just consolidation across the enterprise, but within each of our sites. At our Y-12 complex, for instance, we reduced about a million square feet in the last decade, a little over the last decade. At Pantex, our new Administrative Support Complex will eliminate 52 facilities on our sites.

So being able to use efficiencies as well as any additional funding to bring those buildings down, it not only brings our workforce together in a nice modern facility, but it makes them so much more efficient, because they are together, and they can collaborate and work together in facilities where they are collocated. So I think we are looking at a bigger complex issue of consolidation, but we are certainly looking at it within each of our sites as well.

Mr. SUOZZI. I am certainly taking up too much time, but how many square feet do you have in your total enterprise? Do you know?

Mr. McCONNELL. So real property-wise, we have a little over 2,000 square miles that NNSA is responsible for. As far as the actual gross square footage, I will get you the specific number, but it is equivalent to about six Pentagons.

Dr. McMILLAN. To give you a sense of scale, Los Alamos alone covers 35 to 40 square miles.

Mr. SUOZZI. Well, thanks very much.

Mrs. HARTZLER. Thank you. Good question.

Mr. Scott.

Mr. SCOTT. Thank you, Madam Chairman.

And just for the record, on page 5 of your testimony, Ms.—is it “Reichert” or “Rickert”?

Ms. REICHERT. It is Reichert.

Mr. SCOTT. Reichert.

Ms. REICHERT. It is Reichert.

Mr. SCOTT. I have a mayor back home that spells it the same way. It is “Rickert” for him. That is why I asked.

But I had circled your testimony on page 5 about the public-private partnership. And you mentioned two different ways of doing things. One of them was a GSA lease and one of them, I think the general said you went direct.

What are the primary differences in going through GSA and you going direct?

Ms. REICHERT. The direct approach that we took was certainly supportive of the NNSA, was a local area economic development agency took on the project. So we approached both Amarillo and the Panhandle communities. Panhandle stepped forward. They put out a bond offering, and we got a very good bond rating for that. They put out a bond offering that will finance the facility, and then they hire directly a developer and a contractor to build the facility for which we lease. And that has worked very well for us just going direct.

I don't have a lot of detailed knowledge, you guys may have more, on the Kansas City approach going through GSA, but it worked very efficiently going direct with the local agency.

Mr. SCOTT. Let me follow up on that, if I may, because that brings to mind one of the other questions that I had. So you said that you used a local development agency. So you did not use a private company, you used a local government entity?

Ms. REICHERT. Panhandle Area Economic Development Corporation that actually bond issued and then hired the developer and the contractor that built our facility.

Mr. SCOTT. And they own the facility, and your lease is then with that economic development authority?

Ms. REICHERT. Yes.

Mr. SCOTT. Okay. One of my concerns was with facilities of this magnitude, of this importance to our country, that we end up 30 years from now, whenever the lease ends, subject to whatever the person who owns the property.

Ms. REICHERT. We have got very specific lease agreements in place as far as what they provide for us. At the end of 30 years, if you saw our Amarillo complex, we are a bit out of the way, so I can't imagine that there is going to be a huge demand for the facilities. We are about 25 miles from town, and there is not much out there with us. But we have got very specific language in there that we can continue our leases in order to support the Nation and our plant.

Mr. SCOTT. I assume at a set rate?

Ms. REICHERT. Yes, sir.

Mr. SCOTT. Be careful of the change orders.

Ms. REICHERT. It is a firm fixed price turnkey project, so it is capped.

Mr. SCOTT. Fair enough. So the third-party financing in this case comes through a local development authority, which I think is probably the better way to do it.

General, going through GSA versus going direct, what are the advantages of each one and disadvantages?

General KLOTZ. Let me put it in—as I understand it. First of all, in working with the GSA, the GSA then has to make a business decision in terms of whether or not they want to acquire a particular—build a building or acquire a particular piece of real estate.

And in the case, as Ms. Reichert alluded to, in the case of Kansas City, that was an easy business decision for them to make, because it is a very active metropolitan area. If for some reason the government ever left that particular facility, there are other government agencies that could move in there or there is a market for it on the commercial side.

That is not quite the same case in the area outside of Amarillo, Texas, and I am from that part of the country. And Michelle is right, they are a long way away. So we approach—on all of these things, we do what is called—on all our major capital construction projects, we do a very rigorous analysis of alternatives. That is a new process we brought in about 3 years ago.

Mr. SCOTT. In that analysis, do you include the maintenance of the facility?

General KLOTZ. Yes, sir.

Mr. SCOTT. Is that included in the lease?

General KLOTZ. Yes.

Ms. REICHERT. Yes, sir.

General KLOTZ. And all of our analyses of alternatives, they will run the range from do nothing, in other words maintain the status quo, fix the status quo a little bit, build a new building, approach the GSA, do private development, or go for a line item construction project. So we generally consider the whole gamut. And we are not necessarily restricted to a particular location in terms of doing that.

Mr. SCOTT. My time has expired.

Mr. MCCONNELL. And one item is we do a full lifecycle analysis all the way through the D&D [design and development] of the facility to compare apples to apples.

Mr. SCOTT. And on average, is that 20 years, 30 years?

Mr. MCCONNELL. Forty years.

Mr. SCOTT. Forty years.

Thank you very much.

Mrs. HARTZLER. Thank you.

Mr. Rogers, Chairman Rogers.

Mr. ROGERS. I thank the chairman.

Ms. Reichert, as you know, I have been through Pantex and Y-12, and you are right, the great Americans that work at those two places are real patriots for doing that. They have options. These are not people that need that job. And they are patriots, and I appreciate their service to their country.

General Klotz, we have talked about this before. I know you and I share the same goal, and that is to ensure the nuclear enterprise and its people are ready to be able to meet the challenges in the future. A big part of that is a mutual understanding that we simply must recapitalize NNSA's facilities. You have said to this committee several times, quote, "I think of no greater threat to the nuclear enterprise, security enterprise, than the state of the NNSA's infrastructure," close quote. And you know I agree with that. That is why this hearing is so important. I thank Chairwoman Hartzler for calling it.

Chairwoman Hartzler and I sent a letter, which I will introduce for the record, without objection—

Mrs. HARTZLER. Without objection.

[The letter referred to can be found in the Appendix on page 69.]  
 Mr. ROGERS [continuing]. To Secretary Perry last week that asked the Secretary personally to engage to ensure you bring to this committee hearing a list of infrastructure projects that NNSA could be carried out in the intermediate range if funding was provided. This follows up on a request this committee made to DOE back in January.

I understand that you are not able to provide that today. Is that correct?

General KLOTZ. That is correct.

Mr. ROGERS. That is disappointing. Please ensure that Secretary Perry and the OMB [Office of Management and Budget] understand that we are asking for a simple data call here, not a peek at predecisional budget plans. For example, you sent a letter to us with a similar list last year in response to a QFR [question for the record] from a September hearing.

I would like to introduce that for the record, if I could.

Mrs. HARTZLER. So ordered.

[The information referred to can be found in the Appendix on page 84.]

Mr. ROGERS. It lists projects that you say are, quote, “currently underfunded recapitalization projects that NNSA could execute in the next several years should additional resources be available. The list provided is unconstrained and builds from the project list included in the fiscal year 2017 budget request,” close quote.

Chairwoman Hartzler and I are simply asking for a comprehensive update to that list with a bit more detail. You and I both know that there are plenty of projects that meet this criteria of, quote, “shovel ready,” and are not on the list that you gave us in September.

So I build to this: Can you get us that list in the next 30 days?

General KLOTZ. I can’t promise that, Chairman, because you know what time we are in. We are in budget preparation time. As everyone here well knows, the Office of Management and Budget released its blueprint for the President’s fiscal year 2018 budget today, and I am happy to say that blueprint demonstrates the administration’s strong support for the United States nuclear security enterprise and will help ensure that we have a nuclear force that is second to none.

The details of—well, I mean, the numbers are pretty—are laid out in there, a \$1.4 billion increase for NNSA over the fiscal year 2016 enacted level, which was \$12.5 billion, so that is about an 11 percent increase to that. And, of course, obviously much of that will be going towards all the line items within our budget, in addition to the life extension programs, recapitalization, and maintenance as well.

Mr. ROGERS. How much toward deferred maintenance?

General KLOTZ. I don’t have the—and I can’t release that until the President’s budget comes—

Mr. ROGERS. It was worth a try.

General KLOTZ. Yes, sir. So believe me, we are on the same sheet of music, we have the same goal at the end. And we continue to update this list. We were using our—since the last time we have discussed this with your subcommittee, you know, we continue to

refine our tools, Jim, and work with the labs and the plants to make sure we have the list prioritized in a way that we can.

But right now, as we are in the process of defining what the actual outlines of the President's budget are, we do not want to get ahead of the budget request that he will send up to the Congress in the May timeframe.

Mr. ROGERS. Okay. Well, I thank you again for your service. And you know this is something that is very important to me and to this committee, not only the subcommittee, but this full committee, and we want to stay after it and we want to be supportive. So I look forward to seeing that number.

With that, I yield back, Madam Chairman.

Mrs. HARTZLER. Yes. Thank you, Mr. Chairman.

Dr. DesJarlais.

Dr. DESJARLAIS. I thank the chair.

Representing the great State of Tennessee, I thought I would take the opportunity to share the photo of the fallen concrete incidents at Y-12 to let you help shed some light on the consequences and the magnitude of the problem that we are discussing today.

Ms. Reichert, the picture here of Y-12, what operations were being conducted in that building prior to this happening?

Ms. REICHERT. It is our lithium operations, which are essential to the mission that we support at Y-12.

Dr. DESJARLAIS. Okay. If we were to lose operating capacity there, which did happen for a period of time, would you deem that a single point failure?

Ms. REICHERT. It is one of the key areas of concern that we have for our capabilities, uranium being one, lithium being one as well, high explosives at Pantex being another. All of those are integral to the weapons program, so if we did lose the lithium capability, it would be significant to the weapons program and the deterrent overall. We are working with NNSA right now on a lithium strategy so we can ensure that we have those materials for the future for the weapons stockpile.

Dr. DESJARLAIS. So when an operation like this has to shut down, there is a direct impact to national security?

Ms. REICHERT. Yes, sir.

Dr. DESJARLAIS. All right.

You talked about rodents and snakes and now falling concrete. Does anybody want to just further stress the impact that this has on the mission of the NNSA and to our overall national security?

Dr. MCMILLAN. I would, Congressman.

Dr. DESJARLAIS. Thank you, Dr. McMillan.

Dr. MCMILLAN. I think in Chairwoman Hartzler's opening remarks she very accurately said that this affects the morale of the people that we hire. We work very hard to bring in some of the very best people in the world to our laboratories, and when they come from a university setting, let's leave aside the Googles and the Apples, when they come from a university setting and then come to a national laboratory or one of our plants and they say, "This isn't as good as what our university was," it really doesn't say, "What you are doing is critical for the Nation."

That is the case. I have trailers that were brought onto Los Alamos 30 years ago as temporary structures. They are still there 30

years later. We are working to get rid of them, but we have to be able to move people into real space. There are experiments that we are doing right now with things like manufactured buildings. This year we want to bring a manufactured building onto our site as a way to keep the costs down but take the quality up. We think there is opportunity in places like that.

But one of my biggest concerns after safety is the morale of the people and our ability to retain those people in the service of the Nation.

Ms. REICHERT. I would like to expound on that just a little bit. Representative Rogers, you got to see one of my highlighted facilities on what we call our ugly tour.

Mr. ROGERS. Yeah. There was a lot of ugly too.

Ms. REICHERT. There was a lot of ugly that day, yes, sir.

We bring in some of the best and brightest scientists from across the country, especially in our high explosive technology area, in World War II vintage facilities. Rodents certainly are in those facilities. We get rain intrusion into those facilities, such that we have got high-tech equipment that we have to cover with tarps, and the mold and mildew was starting to attack those facilities as well. We have literally had to move those scientists out to 30-year-old trailers, which were an improvement from their R&D [research and development] facility in which they live now, and then they just go back and forth to the facility to do their R&D work.

I have had young engineers look at me and say, "Ma'am, I could work at a high rise in Dallas and have a company car, you know, I don't need to be uncovering my equipment in order to work on it during the course of the day." So they deserve better than that.

General KLOTZ. Could I just add one thing? As I indicated, I think, in my verbal opening statement, we are doing an awful lot of very important work for the Air Force and the Navy now in terms of the life extension programs for the bombs and the warheads that will go on the new submarines, that will go on the new bomber, will go on the new fighter, will go on hopefully someday a new intercontinental ballistic missile. And it is a very, very tight schedule. The labs and the production facilities are ramping up people and have very tight deadlines to do their work.

If we have to shut down operations for a day, a week, a month because of a corroding sprinkler system or a collapsed ceiling, as you rightly point out, or a whole host of other kinds of age-related issues—and we will always put safety first, we will always put safety first for both our employees and the general public—if we have to shut down for that, the margin we have to deliver what this Nation needs for its nuclear deterrent gets stressed that much more.

So there really is, in addition to recruiting and retention and safety, there is a real, no kidding, potential operational impact to what we are doing.

Dr. DESJARLAIS. I would like to thank the panel.

Mr. SULLIVAN. Congressman, can I add something to that quickly?

Dr. DESJARLAIS. Yes, sir. Mr. Sullivan.

Mr. SULLIVAN. Your question about the impact, I want to just make the point that safety systems and design, building design has

come a long way in the last several decades. And so I would use the analogy, I had a friend who had a 1952 Packard, an old automobile, and he spent a lot of money on that automobile and he kept it running as well as it ran in 1952. But it was still a 1952 Packard, and it didn't have modern safety features like seatbelts and antilock brakes. And we see the same things in these facilities as well.

And really for the Nation, the question is, since we now have the technology that could significantly reduce risk, we should be considering trying to use that, because we still maintain a lot of risk even in well-maintained older facilities.

Dr. DESJARLAIS. Yeah. Great illustration. Thank you.

Mrs. HARTZLER. You bet. Thank you.

Mr. Suozzi.

Mr. SUOZZI. Madam Chairwoman, I would like unanimous consent to enter Ranking Member Moulton's statement in its entirety into the record.

Mrs. HARTZLER. So ordered.

[The prepared statement of Mr. Moulton can be found in the Appendix on page 33.]

Mr. SUOZZI. Thank you.

Mrs. HARTZLER. I have a couple more questions here.

Administrator Klotz, so in the fiscal year 2017 budget request, NNSA requested a one-time funding line of \$200 million to pay for final disposition of the Bannister Road Federal Complex in Kansas City. This funding allows NNSA and the U.S. Government to turn the facility over to a contractor for remediation and disposition and is a good deal for everyone.

Would you please tell us what happens if NNSA does not get this funding in fiscal year 2017? And when is the deadline that NNSA must have this funding appropriated by in order to proceed with the transfer and remediation project? And what happens if the energy and water appropriation gets a full-year continuing resolution and this one-time program does not get a \$200 million anomaly?

General KLOTZ. If you would permit me, Madam Chairwoman, let me start this, but actually Jim McConnell, who is sitting here to my left, is our lead senior executive who is working this for the NNSA as well as our team, Mark Holecek and team out in Kansas City.

This is an extraordinarily good deal for the American taxpayer. As you indicated, we were operating out of a 3 million—we were using 3 million square feet of an even larger facility that was built in World War II. We have now moved out of that. We have made a commitment to the people of Kansas City and the State of Missouri and the State of Kansas that we would not leave that as an eyesore for years or decades to come.

And as it turns out, there are commercial interests in that particular facility. And we can, for \$200 million, which seems like a lot, we can turn that over to a commercial entity to do the demolition and remediation of the property for a sum that is roughly—is less than 25 percent of what we would have to do if we, the U.S. Government, if we, the Department of Energy, were having to remediate it. So big cost savings.

But all committees involved, the two authorizing committees on both sides of the Hill, the two appropriations subcommittees on both sides of the Hill, agreed that this was a good deal and gave us the full mark to be able to pay the private developer the money that is necessary to do that this year, which is when the deadline is.

So without a fiscal year 2017 budget, or if capped at flat line in a continuing CR [continuing resolution] at the fiscal year 2016 levels, we will not have the money to consummate this deal, in a nutshell.

Do you want to add anything to that?

Mr. McCONNELL. Just one of your questions was about timing, ma'am. The three main entities, the State of Missouri, the private corporation that we are engaged with, and the Department of Energy, are on track to work through the issues that need to be resolved prior to transfer. They are mostly involved with the Resource Conservation and Recovery Act, the RCRA, that underpins the environmental cleanup. That is on track with public hearings in Missouri in the not-too-distant future that would result in a transfer in August.

In order to have an August transfer, there has to be the money available for this entity to certify that it has the ability to complete the environmental cleanup, and so that requires us to back up several months to have the money to reach an agreement with Center-Point, who is the corporation going to do the cleanup. That means that it is April or May, right at about the time that this continuing resolution ends, is when we would actually need that \$200 million.

General KLOTZ. If I could just add one thing, Congresswoman. The Congress actually was very helpful in the passing of the continuing resolution by giving us an anomaly, which allowed us to move moneys around in the weapons activity account to cover bills, and without having to go to Congress beforehand. We did have to notify you within 15 days after doing that.

We have exercised that authority, and we exercised that authority to provide some money for this particular effort in order to keep the deal alive, as it were, into the summer while the State of Missouri government and the contractor and our people continued to work through the issues that Mr. McConnell just talked about. But we were borrowing money from other accounts, other activities, that those bills are still going to come due, so they will have to be paid.

So flexibility to move money around is not enough, because there is not enough money in the bank account to cover all that and do all the other things that we need to do in terms of our life extension programs, in terms of the salaries we have to pay, and other activities in that account.

Mrs. HARTZLER. It is very, very important that we get this done. So I appreciate the summary of where you are at right now and then also emphasizing how important it is that we get this figured out in April and May, that we get a full budget.

Administrator Klotz, as it relates to some of the NNSA's large line item nuclear facility construction initiatives, how have the projects performed related to original planned costs scheduled and building specifications, and what mechanisms are in place within

NNSA to provide sufficient oversight of construction and adherence to budget and building requirements.

General KLOTZ. Thank you very much.

I think maybe one of the underlying premises of that question is that in recent times the DOE has had challenges in doing large-scale nuclear-related construction projects, and that is fair. But over the past several years, we have made some significant changes in the way in which we manage both programs and projects to ensure that we have the most highly qualified people leading those projects. We have done a good job, I think, of bringing in practices that were used by the Army Corps of Engineers and by Naval Construction, in fact hired many of their best people into the NNSA, and have begun to make some significant—see some significant progress.

The vast majority of our portfolio is delivered on time and on budget. We have a couple of—and, in fact, except for—you know, we are off the high risk category list the GAO [Government Accountability Office] has for all projects under \$750 million. That leaves three major projects, MOX [mixed oxide fuel], the Uranium Processing Facility at Y-12, and our project to move out of the chemical metallurgy building at Los Alamos is still on the high risk list.

As I think you know, and other members of the committee know, about 3 years ago we restructured our approach to how we are doing that, and I would be happy to go into details now or later, but since we have made those changes and changed our management structure for watching how we exercise oversight over that, both of those are on schedule and on budget. In fact, I have some pictures of the construction that is going on at the Uranium Processing Facility. We are still committed to delivering that facility for \$6.5 billion by 2025. And I was just down there a couple weeks ago, and it is very impressive, the work that is being done.

I don't know if you wanted to add anything to that.

Mrs. HARTZLER. Very good.

Well, I really appreciate your coming today and certainly the important work that you do.

Before we close the hearing, I will give each one of you a chance to make any closing remarks if you haven't perhaps had a chance to make those points before.

So, Administrator Klotz, do you have anything else you want to add?

General KLOTZ. I would. There is a lot of talk, and we will be sending a report to the Congress soon on what we call having a responsive stockpile. To me, that involves a number of different factors. It involves having the right facilities to do the work, the right equipment to do the work, the right people, the talent, the intellectual capital that we need to do that work, and it requires the resources to pay for all three of those things.

And I certainly appreciate the extraordinary support that we have received from this committee as well as other committees in the Congress for moving forward. As I indicated, there appears to be broad bipartisan support across the aisles and across both sides of Capitol Hill, and I would add, at both ends of Independence or Pennsylvania Avenue, on the importance of strategic deterrence for

the security of our Nation and that of our allies. So it is very, very important that we get this right, and we are going to need your support to do that.

Mrs. HARTZLER. Thank you. It is our number one priority. That is right.

Mr. McConnell.

Mr. MCCONNELL. First, the question I didn't answer before. NNSA operates about 36 million square feet of real property.

Mrs. HARTZLER. Okay.

Mr. MCCONNELL. The one point I would like to add, which the Administrator has already made, is we didn't get into this situation overnight. This is the result of a fairly long period of slow deterioration in some of these key facilities. We have now gotten ourselves to the point where we have a significant infrastructure challenge, and we won't be able to get out of it overnight.

So we appreciate your continued support. And this is going to require a collaborative, continuous effort for many, many years at a fairly substantial funding level in order to be able to address the several—\$2 billion—more than \$2 billion worth of current infrastructure needs.

Mrs. HARTZLER. Dr. McMillan.

Dr. MCMILLAN. Chairwoman, I would like to quantify what my colleagues have said. The National Research Council has looked at sort of ratios of how much should be spent as a function of overall replacement value. The number they have come up with is of order 4 percent of the replacement value.

Let me just give you an idea of what that means. At Los Alamos, our replacement value is something like \$14 billion, give or take a little bit. That would mean that we should be spending something on the order of \$550 million a year in maintenance. We spend about \$150 million.

So when we talk about not only the integrated issues of the past, when we haven't had the resources to do that, and how do we not get into this situation in the future, it is going to require substantial resources to do that. This is not a trivial amount of money.

Ms. REICHERT. One thing that I want to reemphasize, like Dr. McMillan, I have been in this enterprise for 30-plus years and have dedicated my life to it. And often my family would say, "Why do you stick with it, especially if you describe the infrastructure as we have it?" And I say, "Because we do very important work." And that is truly what our folks at both of our sites truly feel about their mission.

But as the leaders of our company especially, we have imperatives, which are safety and security. Only when we are safeguarding our folks and the materials to which we have been entrusted can we truly deliver on our mission.

We are very encouraged by the interest we are seeing from the committee, and many members have been to visit our sites and truly understand the issues that we face. We look forward to working with you on addressing these issues in our infrastructure. We have got plenty of very important work ahead of us. So we thank you for the opportunity.

Mrs. HARTZLER. Thank you.

Mr. Sullivan.

Mr. SULLIVAN. Thank you, Chairwoman.

I served many years on U.S. Navy submarines, and a submarine is designed with a hull that will take a certain number of cycles of sea pressure as it submerges and comes back up. And when that predetermined designed life is reached, the ship is taken out of service, and there is very little that can be done to make it extend any further, because the risk is too great.

We don't have that in most NNSA facilities. I mean, the facilities were built many years ago. They had a designed life, you reached the designed life, and then for various reasons most of them are extended beyond the designed life. And I just wanted to reiterate that that brings a safety risk that I would encourage all of us who are in positions of responsibility for the United States Government to think about as to whether or not that risk is something that deserves priority, as the dollars, which are always scarce, are put to various needs.

Thank you.

Mrs. HARTZLER. Thank you. Very, very important.

We appreciate everything that you do, and you really are patriots. We appreciate what that means to our country. So thank you for being here today.

This hearing is now adjourned.

[Whereupon, at 3:40 p.m., the subcommittee was adjourned.]

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**A P P E N D I X**

MARCH 16, 2017

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**PREPARED STATEMENTS SUBMITTED FOR THE RECORD**

MARCH 16, 2017

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**Opening Remarks of Chairwoman Vicky Hartzler  
Subcommittee on Oversight & Investigations Hearing  
“Oversight Review of Infrastructure Needs and Projects Ready for  
Immediate Implementation in the U.S. Nuclear Security Enterprise”  
March 16, 2017**

Many of the buildings, facilities, and laboratories of the U.S. nuclear weapons enterprise were constructed over 65 years ago in the 1940s and 1950s. These facilities currently have a backlog of deferred essential repairs, rehabilitation, and replacement construction totaling \$3.7 billion dollars. Infrastructure needs of this magnitude, if not addressed, threaten both the mission of the National Nuclear Security Administration, or NNSA, its labs, and facilities, as well as the safety of its workers.

The House Armed Services Committee has made NNSA infrastructure needs a high priority in recent years. The Committee has previously authorized substantial increases in funding over President’s past budget requests. However, not until last year did the NNSA, under the direction of the last Secretary of Energy, halt growth in the deferred maintenance backlog. This is an important first step, because as the old saying goes, once you’re in a hole, stop digging.

The funding challenges for the nuclear enterprise infrastructure is two-fold. We need to keep the current infrastructure from deteriorating further. This is an expensive proposition, especially when we must also support day-to-day funding requirements. And, we also need to provide additional funding to start chipping away at the massive infrastructure backlog.

We also need to look at policy, regulation, or statute changes that can be implemented. We can do this without sacrificing critical Congressional oversight or for those that supervise projects within NNSA. There is an Above Threshold Reprogramming limit of \$5 million dollars and a General Plant and Projects, or GPP, limit of \$10 million dollars. We need to consider if such limits are still relevant in today’s fiscal environment. Perhaps they can be modified to more effectively and efficiently implement and oversee infrastructure projects.

Finally, we need to establish and maintain a transparent and open-dialogue about which funding mechanisms are most appropriately utilized. It is possible to exercise the normal “line-item” authorization and appropriations process, or use third-party, public-private partnership financing arrangements. And regardless of funding mechanism, we need to ensure that construction or recapitalization initiatives are not plagued with major cost over-runs and scope under-runs that many of NNSA’s large line-item projects in the past have experienced.

An exemplary model project NOT on the “bad-list” and one that was well-implemented using third-party, public-private partnership financing is

one that I don't mind bragging about from my home state of Missouri. The Kansas City National Security Campus project enabled rapid replacement of the previous dilapidated facility that was housed in a former World War Two era Navy aircraft engine manufacturing plant built in 1942.

In addressing the Kansas City infrastructure project, NNSA and the General Services Administration competitively selected Centerpoint-Zimmer, a private developer to replace the 70 year old Bannister Federal Complex. The 20 year lease on the new facilities not only provides a flexible responsive infrastructure that helps attract top talent, but also saves the taxpayer over \$150 million dollars annually in lower facility maintenance, energy, and other costs. Additionally, this project was completed ahead of schedule and under budget.

Now the outstanding and professional workforce at the Kansas City campus today has a modern, clean, and safe environment in which to conduct their vital and unique work for our nuclear enterprise. This is the standard that we should all hope to achieve for our skilled and dedicated professionals throughout the entire nuclear enterprise if we hope to recruit, train, and retain the best of the best our scientific and engineering community has to offer.

I look forward to discussing the infrastructure needs of the enterprise with our distinguished panel of witnesses we have before us today.

**Opening Statement of Ranking Member Seth Moulton  
Subcommittee on Oversight & Investigations Hearing  
“Oversight Review of Infrastructure Needs and Projects Ready for  
Immediate Implementation in the U.S. Nuclear Security Enterprise”  
March 16, 2017**

Thank you, Madam Chairwoman, and I'd like to thank our witnesses for appearing before this panel today.

Today, our nuclear weapons enterprise is at a crossroads, as we begin to make the first major payouts on a nuclear recapitalization program that is expected to cost over \$1 trillion over thirty years.

As we do this, the Department of Energy, via the National Nuclear Security Administration (NNSA), is focusing extensively on efforts to design and build new weapons systems and new nuclear weapons facilities. Reasonable investments in our nuclear deterrent are essential, but I would caution that we should be wary of doing all of this at the expense of adequate maintenance for our existing nuclear labs and infrastructure.

When we discuss crumbling ceilings and flooded hallways at our nuclear facilities today, I encourage us to ask not just, “Can we build a brand-new building to replace these facilities and how will we find the money?” But also, “How did we get to this point? And are there smart practices and proper incentives that we could have adopted, so that this maintenance breakdown could have been avoided?”

I am concerned that there may be ingrained patterns of safety and budget practice at the NNSA that do not adequately prioritize maintenance over other programmatic requests. These maintenance problems are quite alarming when you consider that poor maintenance in these facilities jeopardizes the morale and safety of our nuclear workforce and poses the risk of a dangerous nuclear accident.

Many of the facilities we are talking about here are old. But for a frame of reference, these facilities are comparable to many run by the Navy's Naval Reactors office, which are also the same age. Yet the facilities run by Naval Reactors are in excellent shape and their safety records are stellar, because Naval Reactors applies different maintenance and safety procedures and tripwires. Nearly 60% of Naval Reactors facilities are 50-70 years old but they are in much better repair. That suggests that we could be doing prioritization, maintenance, and safety better. In the current budget environment, we can't afford for our nuclear enterprise to be governed by inertia and the ways of the past.

So today I'd like to hear from you about our nuclear infrastructure's recapitalization needs, but I'd also like to hear consideration of ways to implement cultural and policy shifts that will make our investments in nuclear infrastructure more sustainable at a lower cost to the taxpayers. I'd also like

us to do more to include a rigorous analysis of alternatives as a key part of how we decide to cost-effectively and efficiently replace aging facilities.

Thank you.

**Statement of Lt. Gen. Frank G. Klotz, USAF (Ret.)**  
**Administrator**  
**and**  
**James J. McConnell**  
**Associate Administrator for Safety, Infrastructure, and Operations**  
**National Nuclear Security Administration**  
**U.S. Department of Energy**  
**Before the**  
**Subcommittee on Oversight and Investigations**  
**House Committee on Armed Services**

**March 16, 2017**

Chairwoman Hartzler, Ranking Member Moulton, and Members of the Subcommittee, thank you for the opportunity to discuss the challenges and progress made by the Department of Energy's National Nuclear Security Administration (NNSA) in improving the state of NNSA's infrastructure. We recognize this Committee's leadership on this issue and appreciate its strong support for the mission and people of NNSA.

NNSA's diverse national security missions depend on its extensive, complex, and in many cases antiquated infrastructure, much of which dates to the Eisenhower Administration and, in some cases, the Manhattan Project era. As a result of the age of many facilities, operations are subject to increasing risk, as is the physical safety of our workforce. Moreover, current demands from NNSA's life extension programs (LEPs) and stockpile stewardship activities have increased pressure on this aging infrastructure. This is also true for the Office of Naval Reactors, which over the past 10 years has had to increase resource allocation to support aging facilities and infrastructure. This trend is expected to continue as it supports the upkeep and modernization of the Navy's nuclear fleet. As I've stated before this Committee and elsewhere, I can think of no greater threat to the nuclear security enterprise than the state of NNSA's infrastructure.

As of the end of FY 2015, NNSA's total deferred maintenance stood at \$3.7 billion. Consequently, arresting the growth of deferred maintenance, gradually reducing it across the enterprise, and building new, modern facilities for our workforce have been among my highest priorities as Administrator. Specifically, NNSA is:

- Working closely with our congressional stakeholders at all stages of recapitalization projects;
- Improving practices to document NNSA infrastructure's condition and suitability to guarantee enhanced accuracy and comparability across sites;
- Enhancing infrastructure strategic planning to ensure it aligns with NNSA program plans, including those described in the *Stockpile Stewardship Management Plan* and the *Prevent, Counter, and Respond* report;
- Deploying new decision-making tools for more effective use of resources;
- Increasing resources for recapitalization, maintenance efforts, and line-item construction;

- Disposing of unneeded facilities where possible and addressing the risks posed by our highest-risk excess facilities; and
- Implementing improved project management systems and all appropriate acquisition options to ensure cost effective delivery of new construction.

In FY 2016, NNSA introduced and Congress supported an improved infrastructure budget structure that separates infrastructure maintenance and recapitalization from daily operations. The use of this new structure improves infrastructure stewardship by helping to limit the growth of deferred maintenance and emphasizing recapitalization to replace obsolete facilities. The focus on recapitalization further improves minor construction project management, and more detailed planning prior to project approval and execution creates smaller, one-to-two-year projects, easing our ability to track financial and schedule performance. NNSA has created standard prioritization criteria to better assess each project's relative importance to achieving program results and improving safety. With these improvements, NNSA completed 79 recapitalization projects with increased transparency to congressional stakeholders in fiscal years 2015 and 2016.

NNSA is also making significant progress in the disposition of excess facilities. In FY 2014 and FY 2015, buildings 9744 and 9808 at the Y-12 National Security Complex (Y-12) in Oak Ridge, Tennessee were razed. In FY 2016, the Criticality Assembly and Storage Areas (CASA) 2 and 3 at the Los Alamos National Laboratory (LANL) in New Mexico were demolished. Provided funding is available, the Administration is preparing to deactivate and dispose of the Bannister Federal Complex in Kansas City, Missouri, in FY 2017. The plan for this project, which has been supported by all four of NNSA's authorizing and appropriating committees, will result in transfer of the property to a private developer for demolition, remediation, and redevelopment in August 2017. Assuming continued support and funding, this action alone will save as much as \$700 million compared to the cost if the government were to complete the decommissioning on its own.

#### **Broader Infrastructure Requirements**

Addressing the extensive needs of NNSA's aging infrastructure requires sustained and strategic investments, which historically have not kept pace with the growing need to replace Cold War-era facilities. NNSA's nuclear security enterprise consists of three types of infrastructure: general purpose, programmatic, and security, all of which support mission work at acceptable levels of risk. NNSA's infrastructure in turn comprises two types of property – real property, such as buildings and building systems (e.g., heating, ventilating, and air conditioning, utilities, and roads), and personal property, (e.g., programmatic equipment, scientific tools, gloveboxes, and manufacturing equipment).

#### **Strategic Materials Infrastructure**

NNSA's Strategic Materials, which include plutonium, uranium, tritium, and lithium, are essential to the nation's nuclear deterrent and also contribute to its missions to reduce the risks of nuclear proliferation and nuclear terrorism. These materials require a highly skilled workforce

and significant programmatic infrastructure to ensure their long-term availability. Accordingly, NNSA is recapitalizing the facilities that support these materials with projects such as the Chemistry and Metallurgy Research Replacement (CMRR) project at LANL and the Uranium Processing Facility (UPF) at Y-12.

LANL performs analysis of the chemical and material properties of plutonium in the CMR Research building, a 1950s-era facility that is now at the end of its useful life. The Chemistry and Metallurgy Research Replacement project will move existing functions into newer, safer, and more efficient workspace. While the CMRR project ensures continuity in plutonium chemistry capabilities, it is only one part of a portfolio of plutonium investments. Reaching congressionally-mandated, Nuclear Weapons Council-endorsed pit production levels requires continued investment in production equipment and critical workforce skills through the Plutonium Sustainment program. In the next five years and beyond, Plutonium Sustainment program investments in these areas support efforts to reach near-term pit production goals of 10 pits per year in 2024, 20 in 2025 and 30 in 2026. In addition, NNSA is conducting an Analysis of Alternatives (AoA) to build the additional capacity we need to ramp up pit production capability to 50-80 pits per year, as required by the National Defense Authorization Act. We expect to have the results of the AoA by early this coming summer.

NNSA's uranium infrastructure spans several sites: uranium storage and processing mostly occurs at Y-12, with some R&D capabilities located at LANL, Lawrence Livermore National Laboratory, and Oak Ridge National Laboratory. NNSA is also reducing mission and safety risks at these facilities to ensure that long-term enriched uranium (EU) operations continue safely.

Under NNSA's Uranium Strategy, key uranium capabilities are being revitalized throughout the nuclear security enterprise. The construction of UPF at Y-12 is vital to modernizing NNSA's uranium infrastructure, providing critical capabilities to the nation's nuclear weapons program, nonproliferation missions, and Naval Reactors. NNSA is committed to ceasing EU programmatic operations in Y-12's Building 9212, a 1940s-era building, and delivering UPF by 2025 for no more than \$6.5 billion.

Another core infrastructure activity is the Tritium Responsive Infrastructure Modifications Program underway at the Savannah River Site. In FY 2015, NNSA approved CD-0 for the Tritium Production Capability line-item project, which will reduce risks stemming from stockpile stewardship operations conducted in outdated facilities. Capabilities and processes related to loading of reservoirs with tritium are currently housed in the H-Area Old Manufacturing Facility, a 1950s-era building that does not meet current codes and standards. NNSA is nearing completion of the AoA, which will inform the conceptual design phase of the project. Alternatives considered include repair and upgrade of existing facilities, new construction, modification of existing facilities, and off-site capabilities.

Lithium is processed and stored at Y-12 in a Manhattan Project-era building that is well beyond its design life. The building has experienced rapid structural and process equipment degradation in the last 15 years. Direct material recycle is currently the primary source of lithium for

warhead LEPS. NNSA developed a bridging strategy to increase the supply of useable lithium and sustain the infrastructure needed to fabricate lithium components in our existing facility until the NNSA's Lithium Production Capability project re-establishes capabilities to purify lithium to meet the needs of NNSA and other government agencies.

### **Enterprise Security**

During 2016, the Office of Defense Nuclear Security (DNS), with the assistance of the Center for Security Technology Analysis, Response, and Testing, conducted a site condition review to assess the state of physical security equipment (e.g., sensors, barriers, and cameras) and infrastructure (e.g., fiber optic wiring, lighting systems, and uninterrupted power source systems) across all NNSA sites. The review verified that much of the physical security infrastructure is well beyond NNSA's lifecycle and in need of refresh or replacement. The information gathered from this review was used to develop a strategy and schedule to refresh and replace the physical security infrastructure.

In addition, NNSA is pursuing new and emerging technologies through a Technology Gap Analysis and Insertion project to address existing and expected security system technology gaps. As these technologies mature, NNSA will approve and insert them into future iterations of this refresh plan. Where feasible, cost containment efforts will include competing the construction work needed to replace security infrastructure and strategic planning to minimize the footprint.

### **Deploying New Decision-Making Tools and Management Systems**

NNSA's traditional measures of facility condition were based on financial metrics that did not capture the physical condition or the relative importance of the asset. To correct this deficiency, NNSA is moving to a risk-based model that evaluates each asset's ability to support core capabilities. As part of this effort, NNSA is implementing several new decision-making tools to make better data-driven, risk-informed management decisions. These new tools include: Enterprise Risk Management (ERM) – composed of the Mission Dependency Index (MDI) and BUILDER – and the G2 program management system.

NNSA started using an ERM methodology in 2015 to inform its programming decisions for future budgets, beginning with FY 2017. The ERM methodology uses MDI and BUILDER to provide a more accurate picture of where the enterprise currently stands and helps prioritize future investments. MDI combines the impact to the NNSA mission if the asset were lost, the difficulty of replacing the asset, and the interdependency of assets.

BUILDER is a Knowledge-Based Condition Assessment tool developed by the U.S. Army Corps of Engineers and recommended by the National Academy of Sciences. BUILDER will allow NNSA to better prioritize investment decisions based on current and future capability and capacity shortfalls. Specifically, the tool will:

- Standardize data collection and reporting on facility condition at the major building component level (e.g., roof, HVAC, structure), providing much greater insight into a facility's condition and its risk of failure;

- Allow NNSA to better predict repairs at the optimal time in each component's lifecycle, allowing us to proactively prioritize investments to quickly address necessary repairs; and
- Combine facility condition information with functionality information, which will determine a facility's ability to meet safety, operational, and mission requirements over time.

Additionally, NNSA issued a Safety, Infrastructure, and Operations Program Management Plan (PMP), which establishes program management processes and procedures, standardizes terminology, increases consistency in scope, schedule, and cost reporting, and improves transparency into direct and indirect funded infrastructure investments. The PMP is updated annually to incorporate lessons-learned through real world execution and experience. To support the new program management methodology, NNSA deployed the G2 program management system in FY 2015 to its infrastructure programs, which empowers Federal Program Managers and Management & Operating (M&O) contractors to manage at the program and project level with appropriate transparency and consistency. The system provides NNSA senior management with a common and transparent picture of the execution, budgeting, and allocation of NNSA's infrastructure investments. The G2 system also allows NNSA to holistically view and analyze infrastructure data in meaningful ways, such as advanced geospatial mapping.

NNSA is expanding on the success of its Roof Asset Management Program (RAMP) to address the needs of other common building components that can benefit from supply chain management efficiencies and lower repair costs. To date, RAMP has reduced deferred maintenance by \$83 million and replaced nearly 5 million square feet of roofs across the enterprise. In FY 2015, NNSA expanded strategic procurements beyond RAMP to Cooling and Heating Asset Management (CHAMP) and plans to expand this approach to water systems in the future.

Most significantly, NNSA is developing its first-ever Master Asset Plan (MAP), which is scheduled to be released in tandem with the annual Stockpile Stewardship Management Plan this spring. The MAP is a strategic, enterprise-wide, risk-informed view of NNSA infrastructure that will be updated on an annual basis. The MAP will provide an integrated view of NNSA infrastructure and a prioritized infrastructure roadmap to reduce risks to mission execution in the near-, mid-, and long-term. Additionally, it will allow NNSA to evaluate the ability of infrastructure to support program requirements and will serve as the roadmap to meeting NNSA's infrastructure end vision.

#### **Practices for Documenting Deferred Maintenance**

In 2013, the Federal Real Property Council directed members to begin annual tracking and reporting of repair needs (i.e., correcting deficiencies to return an asset to its original condition), separate from deferred maintenance (i.e., correcting deficiencies that need to be performed to keep "fixed assets in an acceptable condition"). The tracking and reporting of repair needs allow Federal agencies to better quantify real property deficiencies. Accordingly, over the past two years NNSA worked with representatives from its sites to document a standard method for determining deferred maintenance and repair needs as a step to ensure standardized enterprise-wide reporting. Thus, at the end of FY 2015, deferred maintenance and repair needs were reallocated, and deferred maintenance was adjusted from \$3.7 billion to \$2.5 billion.

Fundamentally, however, the state of the infrastructure has not changed; the reduction resulted from a methodological shift, with approximately \$1.2 billion of the \$3.7 billion now categorized as repair needs.

During FY 2016, NNSA achieved the goal of halting the growth of deferred maintenance, which previously had been growing by hundreds of millions of dollars per year. Halting the growth of deferred maintenance is an important step, though much more needs to be done to maintain and modernize NNSA's infrastructure.

### **Improved Project Management**

The NNSA Office of Acquisition and Project Management (APM) is driving continued improvement in contract and project management practices. This includes policies and procedures that institute rigorous AoAs; provide clear lines of authority and accountability for Federal and contractor program and project management; improve cost and schedule performance; and ensure that Federal Project Directors and Contracting Officers with the appropriate skills and professional certifications are managing NNSA's work. For example, NNSA established the Office of Project Assessments, reporting directly to the Principal Deputy Administrator, to ensure senior leadership visibility and accountability throughout the enterprise for project performance. This office generated significant savings in cost avoidances as a result of its independent project peer reviews.

Since 2011, NNSA has completed approximately \$1.4 billion in projects, a portion of NNSA's total project portfolio, 8% under original budget. Using the Department's best practices, the UPF and CMRR projects were restructured into smaller, more manageable subprojects, significantly reducing project cost and delivery risk. FY 2017 will witness significant progress in the UPF Project, as NNSA is scheduled to achieve 90% design completion on the nuclear subprojects by the end of the year. Following this major milestone, NNSA will establish the final cost and schedule baseline for the UPF Project.

### **Capital Acquisition**

NNSA will continue to focus on delivering timely, best-value acquisition solutions for all of our programs and projects, including non-traditional acquisition practices consistent with statutory authorities and Congressional Budget Office, Office of Management and Budget, and Budget Committee guidance as outlined in A-11 and A-94.

For example, in August 2014, NNSA achieved a major success with the construction of the state-of-the-art Kansas City National Security Campus, a facility for the production of non-nuclear components for nuclear weapons in Kansas City, Missouri. The facility was built by a private developer and then leased to NNSA through the General Services Administration (GSA). This modern campus replaced an antiquated, World War II-era factory. The net result is a 50 percent reduction in our footprint in Kansas City, a \$100 million a year savings to the U.S. Government in operating and maintenance costs, and significantly improved operational efficiency and workforce morale.

Additionally, in August 2016, NNSA broke ground on the Administrative Support Complex at the Pantex nuclear weapons assembly and dismantlement facility in Amarillo, Texas. There, our M&O contractor entered into a lease agreement for a new office building that a private developer will build using third-party financing. This project will allow roughly 1,000 employees to move out of dilapidated, 1950s-era buildings into a modern, energy efficient workspace. It will also eliminate approximately \$20 million in deferred maintenance at the Pantex site and enhance recruitment and retention by improving the quality of the work environment. Through February 2017, we have completed design of the facility and launched several major construction activities, including installation of site utilities, concrete piers and structural steel to the top floor of the facility.

Where it provides best value for the government, NNSA is pursuing line-item capital construction projects such as the Albuquerque Complex. The current Albuquerque Complex, constructed in 1951, is well beyond its designed life and does not meet NNSA federal staff needs. With the continued support of Congress, we will deliver modern office facilities for the Albuquerque workforce while also disposing of the current complex.

To optimize this project, NNSA is leveraging the U.S. Army Corps of Engineers' broad experience in traditional line-item construction projects to act as both our design agent and construction agent. This cooperation builds on our previous experience using the Corps of Engineers as the construction agent for the High Explosives Pressing Facility at Pantex. The High Explosives Pressing Facility at Pantex received Critical Decision 4 (project completion) approval on February 28, 2017, and is turning over for operations now. Reaching this important project milestone is another example of modernizing our infrastructure and replacing antiquated facilities with modern, energy efficient, and safe structures. Its completion will allow for improved safety, security, and quality, and increased production efficiency of high explosives at the Pantex Plant.

### **Conclusion**

Connecting our highly trained workforce with modern, cost effective, safe, and reliable infrastructure will ensure the success of our nuclear security mission. Our strategy for improving infrastructure is innovative and aggressive, it is moving NNSA through a new period in which infrastructure management receives a high-degree of attention that is commensurate with its importance to the nuclear security mission. This requires arresting the decline of NNSA infrastructure, reducing deferred maintenance, disposing of unneeded facilities, and continuing to improve the management of our infrastructure. We look forward to continuing to work with Congress on these and other important national security issues.

**Lieutenant General Frank G. Klotz, USAF (Ret.)**  
**Under Secretary for Nuclear Security and NNSA Administrator**

Lieutenant General Frank G. Klotz, United States Air Force (Ret.), was confirmed by the Senate on Tuesday, April 8, 2014, as the Department of Energy's Under Secretary for Nuclear Security and Administrator for the National Nuclear Security Administration (NNSA).

As Under Secretary for Nuclear Security, Klotz is responsible for the management and operation of the NNSA, as well as policy matters across the Department of Energy and NNSA enterprise in support of President Obama's nuclear security agenda.

Prior to his Senate confirmation, Klotz served in a variety of military and national security positions. As the former Commander of Air Force Global Strike Command, a position he held from 2009 to 2011, he established and then led a brand new 23,000-person organization that merged responsibility for all U.S. nuclear-capable bombers and land-based missiles under a single chain of command. From 2007 to 2009, Klotz was the Assistant Vice Chief of Staff and Director of the Air Staff. He served as the Vice Commander of Air Force Space Command from 2005 to 2007 and was the Commander of the Twentieth Air Force from 2003 to 2005.

Klotz served at the White House from 2001 to 2003 as the Director for Nuclear Policy and Arms Control on the National Security Council, where he represented the White House in the talks that led to the 2002 Moscow Treaty to reduce strategic nuclear weapons. Earlier in his career, he served as the defense attaché at U.S. Embassy Moscow during a particularly eventful period in U.S.-Russian relations.

A distinguished graduate of the U.S. Air Force Academy, Klotz attended Oxford University as a Rhodes Scholar, where he earned an MPhil in international relations and a DPhil in politics. He is also a graduate of the National War College in Washington, DC. Most recently, Klotz was a senior fellow for strategic studies and arms control at the Council on Foreign Relations.

**James McConnell**  
**Associate Administrator for Safety, Infrastructure, and Operations**  
**National Nuclear Security Administration**

Mr. McConnell is the Associate Administrator for Safety, Infrastructure and Operations. He is responsible for overall NNSA safety activities, operations, infrastructure, capital planning, packaging and transportation, nuclear materials integration and sustainment & environmental programs for the NNSA National Security Enterprise. In addition, Mr. McConnell is the NNSA Central Technical Authority responsible for overall safety policy and interpretation throughout NNSA.

Prior to his current position, Mr. McConnell was the Deputy Associate Administrator for Infrastructure and Operations. He held several positions within NNSA's Office of Defense Programs including Assistant Deputy Administrator for Nuclear Safety and Operations.

Mr. McConnell was the first Chief of Defense Nuclear Safety for NNSA. In that position, he established the office and functions of the CDNS.

Prior to joining NNSA, Mr. McConnell held several senior staff positions at the Defense Nuclear Facilities Safety Board (DNFSB) including Deputy Technical Director, Group Leader for the Nuclear Weapons Program, and Site Representative at the Pantex Plant.

A former U.S. Navy submarine officer, he holds a bachelor's degree in electrical engineering from the U.S. Naval Academy and master's degrees in engineering from the Catholic University of America and George Washington University.

**Testimony of Dr. Charles F. McMillan  
Laboratory Director  
Los Alamos National Laboratory  
Before the  
House Armed Services Committee  
Subcommittee on Oversight and Investigations  
March 16, 2017**

Chairwoman Hartzler, Ranking Member Moulton, and members of the Subcommittee, thank you for inviting me to testify today. I am Dr. Charles McMillan, Director of Los Alamos National Laboratory. I am pleased to have the opportunity to continue the discussion we began last fall with the Strategic Forces Subcommittee regarding the status of the nation's nuclear weapons infrastructure. I appreciate your interest in this important subject and efforts to address it.

As I previously testified, the National Nuclear Security Administration (NNSA) Laboratory and Plant infrastructure is the foundation upon which our country's nuclear weapons enterprise is built. Many critical elements of today's nuclear weapons complex are in urgent need of recapitalization. Our weapons program is still second-to-none; however, to maintain this position, we must invest today in the facilities and scientific tools of tomorrow.

As one of three Laboratory Directors required by law to report to the President each year about the status of our nation's nuclear deterrent—and as someone who has devoted my entire 30-plus year career to the U.S. nuclear weapons program—I understand the diverse set of capabilities necessary across the enterprise to ensure the safety, security, and effectiveness of the stockpile.

As is the case with many elements of the nation's infrastructure, investments made in the nuclear enterprise during the Cold War continue to pay significant dividends. In addition, infrastructure investments made during the past 20 years as part of the stockpile stewardship program support our ability to reuse, refurbish, or replace many of our key nuclear components. Looking forward, a stable and predictable investment profile is essential to ensuring that we possess the capabilities required to respond appropriately to evolving or emerging technical or geopolitical challenges.

As Congress and the Administration undertake the process of developing a national infrastructure strategy, particularly as it pertains to the nuclear weapons enterprise, I believe that we must look beyond our immediate needs to ensure that our nation has the flexibility to meet both today's challenges as well as the challenges of an unpredictable future. The current set of scientific tools used to manage the stockpile provide our weapons scientists with insights that were unimaginable two or three decades ago. These are available today because of funding decisions Congress made 15 to 20 years ago; these decisions were informed by the belief that scientific analysis was the best method to support the stockpile without additional full-scale

nuclear testing. Today, your decisions will help set the course for the nuclear enterprise of 2030.

What are the essential features of the nuclear enterprise of 2030? It will require modern facilities to handle high explosives, hazardous materials, plutonium, tritium, and uranium for both research and production, as well as the ability to manufacture radiation-hardened electronics in a trusted foundry. New scientific facilities like the Enhanced Capability for Subcritical Experiments (ECSE) in Nevada—and others—will be needed to qualify new materials and manufacturing processes prior to introducing them into the stockpile.

While Los Alamos is leading the ECSE effort, we are working in partnership with Lawrence Livermore, Sandia National Laboratories, and the Nevada National Security Site, which will house this capability. ECSE will provide enhanced diagnostics for subcritical experiments that are essential to our continuing stockpile stewardship activities. Similarly, the future of stewardship requires an advanced understanding of “materials in extremes,” a capability that can help us better understand the nature and behavior of materials as they experience the environments of an implosion. High Performance Computing, through the Advanced Simulation and Computing and Exascale Programs, will be necessary to integrate the data and discoveries from these new capabilities together into a framework that can be used by our nation’s nuclear weapons scientists and engineers to continue to certify the stockpile.

With that in mind, the need to invest in the people who are the stewards of the stockpile must not be overlooked when discussing infrastructure investment; in fact, the two must go hand-in-hand. The ability to attract, educate, and retain the bright minds who are our next generation of weapons scientists is integral to, and dependent upon, such investment. While Life Extension Programs exercise a subset of the skills needed to care for the stockpile, new opportunities such as the Stockpile Responsiveness Program, should it be funded, represent the potential for an important advance in creating opportunities for exercising the full range of skills associated with nuclear weapons design. Our experience during two decades of Stockpile Stewardship has shown that skills that are not exercised will be lost; we learn by doing.

Madam Chairwoman, we have made progress on modernizing infrastructure across the NNSA enterprise. However, more must be done if we are to retain our leadership position. The NNSA has a substantial backlog of deferred-maintenance projects. Nearly a third of those projects are at Los Alamos alone. Additional resources devoted to maintenance will alleviate part of this backlog; however, some of these facilities must be replaced—something that can only be done via funded infrastructure projects. Many of these projects are shovel-ready today. Should an infrastructure bill be funded, the laboratories and plants could make significant strides toward a modernized nuclear infrastructure. Work of this character would create jobs and provide economic opportunity.

With that as an introduction, I am going to focus the remainder of my testimony on three areas that I hope will help inform your decisions about how to more efficiently direct scarce resources to the NNSA enterprise and better prepare our nation for the future. I will draw most of my examples from Los Alamos since I know them best. As you will see, though, especially in my analysis of policies that are designed to manage risk, the benefits of finding efficiencies and eliminating hurdles apply across the entire enterprise.

- The first area I will discuss are the so-called “**shovel-ready**” projects, because any resources directed to them can provide immediate near-term benefit.
- The second area I will discuss are the various elements necessary for sustaining the **plutonium infrastructure at Los Alamos**, while simultaneously trying to control costs and maximize efficiencies.
- Finally, I will discuss what I consider to be one of the most important issues—**managing risk** and eliminating hurdles as it pertains to acquiring and effectively using the infrastructure across the NNSA enterprise.

### **Shovel-Ready**

As I begin this discussion, I would like to acknowledge NNSA (NA-50) for its efforts in identifying the magnitude of deferred maintenance and repair needs across the enterprise.

For the purpose of this hearing, I define “shovel-ready” projects as those that are capable of execution within the next two years. In general, the shovel-ready projects I am addressing are more tactical efforts that, by themselves, should not be expected to solve long-term strategic infrastructure problems.

During a recent series of NNSA site reviews, more than \$3 billion worth of needed investments across the enterprise were identified, with \$1.3 billion of those at Los Alamos alone.

To illustrate the funding gap, Los Alamos spends about \$150M annually to maintain its facilities. This falls far short of the National Research Council’s recommended metric of 4% of Replacement Plant Value (approximately \$14B at Los Alamos), which would indicate an annual investment closer to \$550M. This disparity is typical across the nuclear enterprise. Given this annual gap between infrastructure need and current funding levels, NA-50 estimates of deferred maintenance are credible.

It is reasonable to ask whether a substantial infusion of infrastructure money can be effectively used at a laboratory like Los Alamos. Recent history indicates this can be

done; examples of successful execution include American Recovery and Reinvestment Act funding (\$270M), and the Cerro Grande fire recovery appropriation (\$340M).

At Los Alamos, shovel-ready infrastructure projects can be grouped into four broad categories:

1. general infrastructure and maintenance,
2. facility disposition/risk reduction,
3. equipment needs as part of the scientific infrastructure, and
4. line-item construction projects

Balanced funding across these four categories is necessary to ensure success; and success will have significant positive impacts on all of the Laboratory's national-security missions.

Below, I will provide several examples of projects that we believe to be shovel-ready. I will discuss the impacts that completing those projects would have on our essential missions.

To give you a sense of the scale of our challenge, Los Alamos National Laboratory covers an area roughly the size of the District of Columbia. Every year we make tough calls when setting priorities for infrastructure and maintenance spending. Mission priorities rank highest, with roads, electrical infrastructure, and offices as lower priorities. As a result, we currently have some employees in "temporary" trailers that have been in use for more than 30 years, and we regularly have to manage rodent issues, leaking roofs, and other effects of aging. Such an environment is not conducive to hiring the nation's best-and-brightest workforce, and certainly does not provide our laboratories with a competitive edge in recruitment and retention when contemporary private-sector technology companies offer sleek and inviting campuses. Infrastructure investments would allow us to demolish old structures and move the workforce of the future into offices and laboratories that are appropriate for their mission. As an example of the efficiencies we are exploring, this year we are moving forward on the acquisition of modern, modular structures that are built offsite and installed at the Laboratory.

Investing in facility disposition/risk reduction would allow us to take down old office and laboratory spaces we currently do not use, but which we must continue to maintain in a safe condition. If we can eliminate these structures, we would redirect maintenance funding from these old structures to other better priorities.

Equipment investments would allow for the procurement of research equipment such as vessels that support tests at the Dual-Axis Radiographic Hydrodynamic Test Facility (DARHT) and U1A underground test facility in Nevada. These vessels, while not part of a facility structure per se, are in fact essential large-scale experimental equipment. Procurement of these vessels would help the nuclear complex increase

the tempo of experiments that are required for our current Life Extension Program (LEP) work. These procurements would be utilized by all of the laboratories. The nuclear weapons enterprise relies on both off-the-shelf and one-of-a-kind scientific and technical equipment to support stockpile stewardship.

### **Plutonium Infrastructure**

The projects listed so far have designs that are mature enough that we could begin execution fairly quickly. However, there are critical capabilities that extend beyond “shovel-ready,” but would benefit significantly from increased investment.

Our country currently has an extremely limited capability to manufacture plutonium pits. Through the first two phases of NNSA’s Plutonium Strategy, Los Alamos is repurposing parts of two existing facilities in order to move analytical chemistry and materials characterization capabilities out of the 1950’s-era Chemistry and Metallurgy Research (CMR) building. Fully executing these two phases should allow us to achieve a production capacity of 30 pits per year. Once these two steps are executed, we effectively have no more opportunities to refurbish existing nuclear space at Los Alamos because this space will be at capacity, yet insufficient to accommodate the future mission portfolio.

Phase 3 of the plutonium strategy, for which an Analysis of Alternatives is currently underway, calls for the construction of plutonium modules that would connect as extensions to PF-4. These modules will provide two important capabilities: first, the ability to reach the capacity requirement of 80 pits per year established by U.S. Strategic Command (USSTRATCOM) and documented in the National Defense Authorization Act (NDAA); second, and perhaps as important, the project will allow us to move the highest risk radiological activities to modern facilities. This would help extend the life of PF-4 and delay a replacement cost of many billions well into the future. As Director, I am doing everything possible to ensure that we maximize the life of PF-4, and I have proposed to NNSA a series of multi-year investments for the facility while simultaneously developing strategies to drive efficiencies as we safely execute work. Timely completion of the Analysis of Alternatives is necessary to meet our pit production goals at the end of the next decade—a target that will be challenging under the best of circumstances. We have no room for error.

### **Hurdles to Efficient Execution of Infrastructure Projects**

The Committee has asked that I provide some specific suggestions to address hurdles that we face in infrastructure projects.

I believe that pre-project analyses and reviews, while certainly important, could be streamlined and done in a more timely fashion. It is also critical that operational and safety decisions, made during the planning phase of a project, remain unchanged once the project is completed and operation begins. Once a project has been

completed, debates (particularly those based on local interpretation of regulations) can lead to delays in starting operations and add unanticipated costs.

The laboratories and plants have used General Plant Projects (GPP) as a very efficient way to address modest-scale infrastructure needs. Efficiency is achieved by matching the level of review and project formality to the complexity of the project. For more than eight years, these projects have been capped at \$10M. One way to reduce hurdles would be to raise the GPP limit to \$30M, and index the limit to inflation. This is a proposal that shares the strong support of my colleagues at Livermore and Sandia.

Another barrier that could be eliminated is the current policy requiring each site to dispose of an unneeded facility (of the same type) during the same fiscal year as new space is built<sup>1</sup>. The unintended consequence of this policy is that sites are forced to sub-optimize and hang on to old, unneeded facilities (with the accompanying risk that comes with them) while working through the planning for a replacement facility, rather than disposing of obsolete, unneeded facilities as soon as is safe and practical.

For smaller, low-hazard acquisitions (such as light laboratory and office space), innovative acquisition processes can be enhanced and streamlined. I believe there are additional opportunities for the enterprise to creatively provide infrastructure through third-party financing (TPF) arrangements, and public/private partnerships. As I noted during my testimony last fall, the Administrative Support Complex (ASC) at Pantex is a precedent that illustrates effective use of third-party financing.

Finally, leased properties are a cost-effective solution for a site's portfolio. While we understand that the government wants to limit this approach to only what is needed, multiple reviews and time-consuming transactions are currently required to renew existing leases and pursue new, cost-effective leases. Sites should be allowed to manage their facility portfolios in the most cost-effective, streamlined manner, and provide the government with performance, rather than the extensive, transactional process currently in place.

If the objective is that the NNSA enterprise executes its mission effectively for the nation, some of this unnecessary bureaucracy should be eliminated or streamlined.

### **Managing Risk**

Risk is inherent to laboratory and plant operations. A short and necessarily incomplete list of risks includes programmatic, safety, security, nuclear, financial, and project risks. I applaud the growing trend within the government and the Department of explicitly discussing and managing these risks. However, making

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<sup>1</sup> National Strategy for the Efficient Use of Real Property, OMB, Spring 2015; DOE Real Property Efficiency Plan, November 2016; DOE Order 430.1c

changes in this area is a daunting task. Past practice has led government managers to attempt to minimize risks within their domains of responsibility. This leads to an improper balance of risk elements between projects, program, and operations across a site, and oftentimes we observe that minimizing one risk results in the emergence of others. Thus, an organization responsible for safety may attempt to minimize accidents without regard to programmatic costs, or a project manager may work to meet project costs without regard for the security consequences. These forces can easily lead to bizarre and costly results (for example wanting to put an engineered fire suppression system on an electric forklift when a colleague standing by with a fire extinguisher would be adequate). Furthermore, balancing the many components of risk, rather than attempting to minimize each individually, is a much more complex task for the department, its plants, and laboratories. It is inevitable that occasionally, risk will become reality. If we are to avoid regression to managing the components of risk in a fragmented rather than an integrated fashion, we must all respond by learning, correcting, and moving on. Sophisticated and mature management of risk may well be the most important hurdle Congress can address to improve efficiency.

#### **Closing**

In closing, I want to thank the Subcommittee again for its continued interest in the infrastructure that plays such an essential role in our nation's security. Should Congress provide additional funding to accomplish the NNSA mission, such funding could help to make necessary progress toward providing the infrastructure to support strategic deterrence in a time of uncertainty.

**Charles F. McMillan**  
**Director, Los Alamos National Laboratory**

Dr. Charles F. McMillan became Director of Los Alamos National Laboratory and President of Los Alamos National Security, LLC in June 2011. The Laboratory is a principal contributor to the U.S. Department of Energy mission to maintain the nation's nuclear weapons stockpile. Los Alamos uses innovative science and technology to enhance global nuclear security and protect the world. Los Alamos has an annual operating budget of approximately \$2.45 billion, roughly 10,000 employees, and a nearly 40-square-mile site featuring some of the most specialized scientific equipment and supporting infrastructure in the world.

Since his appointment, McMillan has guided Los Alamos through continuing high levels of mission execution. He has signed six annual assessment reports to the President and Congress evaluating the Los Alamos-designed weapons in the stockpile. Under McMillan's leadership, the Laboratory has continued to innovate new techniques and tools to ensure that nation's deterrent remains safe, reliable, and effective. For example, Los Alamos debuted and has exercised novel systems that provide exponential improvements in data-gathering for subcritical nuclear tests.

Prior to becoming Laboratory Director, McMillan served as the Principal Associate Director for Weapons Programs, responsible for the science, technology, engineering, and infrastructure enabling the Laboratory to fulfill its nuclear deterrent mission. McMillan directed research that supported the technical analysis necessary to ensure stockpile safety, security, and effectiveness. This included small-scale materials experiments through fully integrated hydrotests that provided essential modeling and simulation data necessary for validation in the absence of full-scale nuclear testing.

McMillan has more than 30 years of scientific and leadership experience in weapons science, stockpile certification, experimental physics, and computational science. He began his career as an experimental physicist at Lawrence Livermore National Laboratory in 1983, where he held a variety of research and management positions for two decades.

He holds a doctorate in physics from the Massachusetts Institute of Technology and a bachelor's degree in mathematics and physics from Washington Adventist University. He has earned two DOE Awards of Excellence for his work in developing an innovative holographic tool that enhances the ability of scientists to predict nuclear performance. He is a frequent speaker on the vital role of national laboratories for the nation, and the importance of science, technology, engineering, and mathematics (STEM) education in cultivating the talent necessary to sustaining that role in the future.

He resides in Los Alamos, NM, with his wife Janet, with whom he raised three children.

**Statement of Michelle Reichert, Deputy Enterprise Manager**

**Consolidated Nuclear Security, LLC**

**on**

**“Oversight Review of Infrastructure Needs and Projects Ready for Immediate Implementation in the Nuclear Security Enterprise”**

**Before the**

**Subcommittee on Oversight and Investigations**

**House Committee on Armed Services**

**March 16, 2017**

Chairwoman Hartzler, Ranking Member Moulton, Members of the Subcommittee, thank you for the opportunity to submit this statement on the infrastructure needs facing the National Nuclear Security Administration (NNSA), the nuclear security enterprise, and in particular, the specific challenges facing the Pantex Plant in Amarillo, Texas, and the Y-12 National Security Complex in Oak Ridge, Tennessee. Consolidated Nuclear Security, LLC (CNS) is very appreciative of the continued support the House Armed Services Committee has given the sites over the years as well as your support of several new projects that will improve conditions at both Pantex and Y-12.

CNS is the management and operating contractor for the NNSA’s two primary nuclear production sites: the Pantex Plant and the Y-12 National Security Complex. CNS assumed the management and operating responsibility for the sites on July 1, 2014. Pantex is our nation’s only nuclear weapons assembly/disassembly facility. Y-12 is our nation’s only nuclear weapons secondary facility. Without the essential work performed at Pantex and Y-12, our Nation will be unable to maintain the nuclear deterrent. The quiet, but important, work done in these two facilities is essential to the security of our nation and our allies. It is a privilege to work alongside the patriots that comprise the federal and contractor workforces in support of our vital mission. It is also a privilege to engage with our host communities as we work together to improve both the sites and the surrounding areas.

Both sites have long and storied histories of contributing to the nation’s nuclear deterrent. The Pantex Plant produced conventional bombs and artillery shells when it was established during World War II, but was recast in the 1950s as a main hub for the assembly of thousands of nuclear warheads. Since 1975, Pantex has been the nation’s primary assembly, disassembly, retrofit, surveillance, and modification center for nuclear weapons. Pantex also produces the chemical high explosives used in nuclear weapons and serves as the interim storage location for plutonium components that have been removed from dismantled nuclear weapons.

Y-12 was established as one of three Manhattan Project sites and produced the enriched uranium that fueled the Little Boy atomic bomb that contributed to the rapid conclusion of World War II. As the Cold War grew, Y-12 served as a key cog in the nation’s nuclear deterrent, and today it remains an essential component in the nuclear security enterprise. Its missions include manufacturing, dismantlement and surveillance of highly enriched uranium components, and serving as the country’s primary safe and secure storehouse of highly enriched uranium. Y-12 also supplies the enriched uranium feedstock that is

fabricated into fuel for Naval Nuclear Propulsion use. With our vast uranium expertise we play a major role in efforts to secure vulnerable nuclear material around the world and curb nuclear trafficking and smuggling.

Both sites have performed their essential missions and evolved their roles in support of our Nation since their inception. They have not, however, been immune from the effects of time, similar to other infrastructure across the country. Many key facilities at both sites were constructed in the 1940s and were intended to operate for as little as one decade. Many facilities and their supporting infrastructure have exceeded or far exceeded their expected life, and major systems within the facilities are beginning to fail. Sustaining these facilities while continuing to produce mission deliverables in a work environment that enables attracting and retaining the needed world class workforce is a considerable challenge, as is adequately capturing and allocating deferred maintenance and replacement funding.

Our dedicated employees diligently plan and work to maintain our production capabilities and a safe and secure working environment, but the effort necessary to sustain our capabilities continues to grow. A better overall approach is required.

Between Pantex and Y-12, CNS has approximately \$800 million in deferred maintenance currently on its books. Approximately \$175 million of that deferred maintenance is for mission critical facilities. Under the direction of former Energy Secretary Ernest Moniz and NNSA Administrator Lt. Gen. Frank Klotz, there has been a push to arrest the deferred maintenance growth across the nuclear security enterprise, but significant investment is required to appreciably reduce that backlog and sustain safe operations for the extended life of these vital mission facilities.

With an appropriate investment, we could move quickly to begin making a dent in the deferred maintenance backlog, moving out on a broad complement of near-term projects. These are projects that could accelerate efforts to reduce the deferred maintenance backlog, and they range from major capital projects to replacing roofs, HVAC and dehumidification equipment, electrical equipment, and failed power poles. Some projects that could be tackled quickly are relatively small and could be started and finished in a year; others are larger and longer term, and could span several years. Each project, however, helps reduce the risk to our workers and to mission interruption.

Some of the projects are also ideal to be performed by subcontractors, enabling quick mobilization of workers, accelerated reduction of risks, and a stimulus to the local economy.

We will always work to maintain safe and secure conditions at our facilities, but the considerable effort to do so naturally impacts our ability to maximize our delivery of the mission. Without a more concerted effort to invest in the nuclear security enterprise, it is not likely we will ever reduce the backlog of deferred maintenance and infrastructure issues facing our sites. In fact, it is likely that backlog will grow.

The primary concern with knowingly deferring maintenance is that a major, unforeseen failure could occur. Our top non-negotiables—we call them our imperatives—are safety and security. We will protect our people, our communities, the materials we are entrusted with, and the environment in which we and our friends, neighbors, and communities live. Our nation also relies on us to deliver our mission with the highest quality products and services. Keeping our facilities and working conditions safe, secure, and operating properly requires ever-increasing operations and maintenance funding because the potential

disruption to operations and mission deliverables is a real concern, as is the likelihood for a substantial increase in costly repairs.

This degradation hasn't gone unnoticed. Our workers experience it every day and are vigilant in their efforts to perform to the highest standards while often working in facilities that are less than ideal and are the subject of frequent repairs and outages. Furthermore, many of our workers have had life-long careers at the sites and for them, keeping the sites operating is truly a service to the Nation knowing what a difference these sites have made. Attracting and retaining the next generation of great workers becomes more challenging in facilities that are in a deteriorated state. Congress and the NNSA are well aware of the challenges, and so is the media.

A 2012 Washington Post article described Building 9212, the main hub of our production activities at Y-12, as the "most pressing example of neglect and deterioration" across the nuclear security enterprise, describing a building made of "clay tile and cinder blocks" that "looks its age" with "large patches of rust and corrosion on interior walls" and a roof that leaks when it rains. The new Uranium Processing Facility scheduled for completion in 2025 will replace 9212, but until then 9212 must remain operational.

"For two decades, U.S. administrations have confronted the decrepit, neglected state of the aging nuclear weapons complex. Yet officials have repeatedly put off sinking huge sums into projects that receive little public recognition, driving up the costs even further," the Post wrote.

After a 2015 tour of Pantex, Rep. Mac Thornberry, the chairman of the House Armed Services Committee and our Congressman at Pantex, wrote in a letter to Energy Secretary Ernest Moniz that he continued to be "struck by the deplorable state of its infrastructure and facilities." Another tour by another group involved an encounter with a snake, which is not such an unusual occurrence in some of the site's older buildings.

Last summer, the Amarillo Globe-News noted that many Pantex buildings have outdated electrical systems and leaky roofs, with employees resorting to putting tarps over high explosives testing equipment to protect it during storms.

And recent national press coverage described continued concrete deterioration in the ceiling of Y-12's 9204-2 facility that has posed a safety risk while significantly increasing the cost for necessary replacement of dehumidifying equipment mounted on the floor above the ceiling. As a result of severe concrete spalling and reinforcing bar degradation, load limits have been established by our engineers that only allow two people in the area above the spalled structure at one time. Other similarly-aged facilities are being evaluated for similar conditions.

Unfortunately, failing infrastructure and problems that arise from deferred maintenance occur on their own timetables and can adversely affect production and safety, even with preventative measures. In recent years, utility failures, steam and plant air outages, potable water interruptions, and high-pressure fire loop lead-in failures have all caused production stoppages, which has created additional significant pressure on mission delivery efforts.

Since CNS President and CEO Morgan Smith last testified before Congress in September, our sites have continued to have issues. In February, the Pantex Plant's computer capabilities were shut down when a backup generator failed during an unplanned electrical outage. Pantex's aging Computer Data Center is equipped with a backup generator, but it failed, leaving the facility without power and the plant without

computer capabilities. Y-12's legacy 9103 data center is in even worse shape as it has no backup power, HVAC that is more than 30 years beyond its projected end of life, and could potentially take down the site for a significant amount of time if it experienced a similar electrical event to Pantex.

And earlier this month, an elevated walkway leading to the Building 9215 Annex was declared structurally unsafe for routine use because the walkway's supports had deteriorated. The walkway is the only way employees can access offices supporting the Depleted Uranium Foundry without going through a radiation contamination area, and approximately 10 employees were moved to different offices until the walkway was temporarily repaired. The walkway has long been identified for replacement, but funding levels have prevented that from occurring and a permanent solution remains years away.

Unplanned outages to humidity control equipment last year immediately shut down production in Building 9204-2. Process failures (such as fan or pump motor failures) happen on an average of about once a year, which can result in outages up to one week. This is compounded by the fact that there is no excess capacity for humidity control equipment.

The electrical distribution systems at both sites are also experiencing age-related failures. For example, underground electrical connectors have exceeded their design lives and are beginning to fail. When these do fail, power interruptions to mission-critical and mission-dependent facilities impact production activities.

The failed condition of approximately 600 utility poles at Y-12 create a significant risk to site electrical and communications distribution systems. Current funding levels do not allow full replacements, and a major wind or storm event presents the risk of power and communication interruptions.

The High-Pressure Fire Loop lead-ins at Pantex also suffer from age-related corrosion and exhibit multiple failures each year. There is an ongoing effort to replace and upgrade all affected portions over the next decade; however, the failures are occurring at random locations which directly impact production bays and cells, and mission work cannot be supported until the leak is fixed or piping replaced, which can often take several months to accomplish.

While the conditions are difficult and we are unable to turn back time, it is important to note that we are not sitting idly by and allowing our systems to age into obsolescence. At Pantex and Y-12 we have charted a clear path to address infrastructure and deferred maintenance concerns and position both sites to continue to serve as essential cogs in the nation's nuclear deterrent for decades to come.

From 2002 to 2012, the Facilities and Infrastructure Recapitalization Program, known as FIRP, eliminated \$141 million in deferred maintenance at Pantex and \$198 million in deferred maintenance at Y-12.

Since 2003, the demolition of excess facilities has eliminated \$16 million in deferred maintenance at Pantex and \$76 million at Y-12. At Y-12, we're continuing to partner with the DOE's Office of Environmental Management on plans to prepare additional buildings for their eventual demolition.

Of note are the Alpha 5 and Beta 4 buildings, which are shut down, and the 9206 building, which is still a Category 2 Nuclear Facility with only a deinventory mission left to fulfill. These facilities are no longer used in production, sit adjacent to active production areas and would present a significant risk to mission activities if the buildings were to further deteriorate. Eventually the facilities will be turned over

to the Office of Environmental Management for demolition, but until that time we must keep them in a safe and stable configuration.

Through additional funding provided in FY 2016, the Alpha 5, Beta 4 and 9206 facilities at Y-12 were outfitted with new spray-foam roofs that will protect the facilities and the environment by mitigating leaks, sealing penetrations, and slowing the roofs' deterioration. To appreciate the scale of this effort, the area of the three roofs combined is 280,000 square feet (more than 5 football fields).

In addition, tanks and dikes outside of Alpha 5 and Beta 4 were disconnected, drained, and filled with concrete. Beta 4 also had its Manhattan Project-era electrical system replaced by a temporary "construction power" setup that will provide as-needed electricity to the building in a manner that is safer, more reliable, and will allow for simpler demolition activities in the future. Water that has flooded the basement of Alpha 5 was also evaluated for eventual removal and treatment.

Along with eliminating excess and deteriorating facilities, we are also embarking on the largest set of capital construction projects for both sites in decades. At Y-12, the Uranium Processing Facility is moving forward. When completed, it will provide modern, safe, and secure facilities for processing uranium—activities that are currently conducted in facilities that are over 70 years old. It will also help eliminate \$28 million in deferred maintenance in the 9212 facility. However, sustainment activities will be necessary over the next 10 to 15 years in order to accommodate the transition to UPF.

In February, we completed construction on the Pantex High Explosives Pressing Facility, and we are in the planning stages for a new High Explosives Science and Engineering facility at Pantex and a new lithium production facility at Y-12.

Also at Pantex, we recently received the go-ahead for a new privately financed and constructed Administrative Support Complex. Construction began last fall and will take approximately two years. The 343,000-square foot facility will include general office space for 1,100 employees, a conference center, cafeteria, visitor's center, and medical and wellness facilities. It will also eliminate \$20 million in deferred maintenance while greatly improving the quality of work life for federal and contractor employees.

Similar administrative facilities were built at Y-12 over the last decade. The Jack Case Center was built in 2007 and at 400,000 square feet, it houses approximately 1,500 employees and replaced numerous aged facilities that were not designed nor intended for office space. The New Hope Center was completed in 2007 and has five laboratories as well as 16 conference rooms, an auditorium and Y-12's history center. Additionally, the Highly Enriched Uranium Materials Facility began operations in 2010 and serves as the nation's premier storehouse for highly enriched uranium.

Smaller projects also make a big difference. At Y-12, Energy Savings Performance contracts have helped buy down deferred maintenance by \$14 million. Currently, there are five main projects at different stages of progress, including a chiller plant upgrade, steam system decentralization, lighting upgrades, a new compressed air facility, and steam system repairs. The upfront capital for these projects is funded by a subcontractor, which is paid through the savings; however, Y-12 is responsible for support costs, including activities such as lock out/tag out, utility surveys and engineering drawing review. At Pantex, the third-party financed wind farm produces about 60 percent of the plant's electricity in the form of clean energy.

Other ongoing initiatives that will help reduce deferred maintenance include efforts to replace the high pressure fire loop lead-ins at Pantex, production facility modernizations at Pantex, the Nuclear Facilities Electrical Modernization project, and HVAC replacements for both sites.

While recapitalization is a priority, preserving our currently operating facilities is not taking a backseat. Y-12 is developing an Extended Life Program, or ELP, for Buildings 9215 and 9204-2E, two key processing facilities. These two facilities along with the plant laboratory, 9995, will house all enriched uranium material processing activities not incorporated into the Uranium Processing Facility design, and they will be expected to work in tandem with the new Uranium Processing Facility to meet the future needs of the country. The Extended Life Program will reduce material at risk in the facilities to lessen the consequences of any potential accidents, replace or refurbish key facility infrastructure and process equipment, and address and update regulatory requirements for extending the lives of the facilities. We have engineers monitoring these facilities closely, and support of the Extended Life Program will require additional funding over a number of years to ensure safe mission capabilities are sustained in these vital extended life nuclear facilities.

The Y-12 infrastructure and support facilities that sustain not only Buildings 9215 and 9204-2E, but the entire plant, are generally beyond design life, with a significant portion of electrical equipment that is no longer manufactured and process equipment also beyond design life and in need of upgrade/refurbishment. Fire water distribution systems, humidity control equipment, steam and condensate return distribution systems, cooling towers, and facility structural conditions are also significant risks to the health of the plant.

Planning is also underway for a Material Staging Facility at Pantex that would relocate existing high security nuclear weapons and nuclear weapons component storage and staging areas in the plant's Zone 4. The current facilities in Zone 4 are between 45 and 65 years old, and a Material Staging Facility located in Pantex's production area would help replace those facilities as well as reduce the size of Pantex's aging Perimeter Intrusion Detection and Assessment System, or PIDAS, and eliminate the need to transport weapons and weapons components between two areas of the plant.

Along with Lawrence Livermore National Laboratory, Pantex and Y-12 have piloted a software program for the NNSA designed to better track and manage building infrastructure maintenance. The sites were designated as BUILDER Centers of Excellence in 2013 by NNSA and are in the process of implementing the U.S. Army Corps of Engineers' BUILDER Sustainment Management System. The program is designed to let managers proactively respond to infrastructure maintenance needs, and when complete, Pantex's 620 facilities and Y-12's 345 buildings will be integrated in the program.

Several policy changes could also make it easier for contractors to address deferred maintenance risks. For instance, the NNSA ceiling on general plant projects has been set at \$10 million since 2009, and escalation has eroded the buying power and scope of work that can be accomplished. Construction-related infrastructure projects are defined as line items if they reach the \$10 million level. Due to the high demand and limited supply of line item funding, and the long timeline to achieve line item approval, many vital infrastructure needs go unanswered until they become critical. Raising the general plant project ceiling would address the impacts of inflation and allow many key infrastructure needs to be addressed within the site's annual operating budget.

Infrastructure needs across the complex could also benefit from an increase in the internal reprogramming threshold from \$5 million to \$10 million. Such an increase would provide the NNSA flexibility to move funds to address high priority needs.

NNSA has also had success with alternative financing projects in recent years, notably at Y-12 (Jack Case Center and New Hope Center) and Pantex (Administrative Support Complex). Despite the success of these projects, there continues to be a growing backlog of infrastructure needs, and NNSA would benefit from additional flexibility to provide non-mission-critical infrastructure in a timely and economical manner with the demand for line item funding far exceeding resources. However, the current climate is not conducive to realizing operating leases. Current alternative financing policies, including scoring language in OMB Circular A-11, Appendix B make it very difficult to structure a longer term operating lease that meets the government's needs while attracting the private sector to support operating lease proposals. Lease scoring changes and a firm position and policy on alternative financing is needed.

CNS remains committed to helping maintain the nation's nuclear deterrent and providing a safe and secure workplace for the thousands of dedicated men and women who come to work every day at Pantex and Y-12. With many new projects at both sites on the horizon and significant efforts to modernize and maintain the sites underway, the future is bright. The federal and contractor teams at our sites are up to the challenge that is laid before us, but significant reductions in deferred maintenance will not be realized without continued investment strategies. Similar to a FIRP Program, a significant additional annual investment above current funding levels would be required to reduce deferred maintenance. With additional investment, we can quickly begin to accelerate that reduction with near-term projects. Until this is done, there will be periodic disruptions to mission accomplishment while unplanned emergent items are dealt with and impacts on production are subsequently addressed through recovery schedules and worker overtime, whenever possible. Current funding levels presently allow us in many areas only to treat the symptoms of age rather than address the fundamental degradation.

A robust recapitalization program that includes funding for new construction projects and the disposition of excess facilities will complement continued enhanced efforts to address existing deferred maintenance issues. Each are essential actions that need to be taken to preserve our important mission work, ensure the continued safety of our workforce, and help keep Pantex and Y-12 on track to provide a safe, secure and effective nuclear deterrent into the future.

Thank you for the opportunity to speak to you today.

**Michelle Reichert**  
**Deputy Enterprise Manager**  
**Consolidated Nuclear Security, LLC**

Michelle Reichert serves as the deputy enterprise manager for Consolidated Nuclear Security, LLC, the management and operating contractor for the Pantex Plant in Amarillo, Texas, and the Y-12 National Security Complex in Oak Ridge, Tennessee. She is responsible for coordination of integration activities between the two sites as well as enterprise-wide communications with the NNSA, employees and other key stakeholders.

Previously, Reichert was the site manager at the Pantex Plant, where she oversaw daily operations to sustain a safe, secure and effective nuclear deterrent. She has 28 years of experience in Department of Energy conduct of operations environments. Her responsibilities have included deputy project management and senior leadership in environment, safety and health; safeguards and security; emergency management; waste management; transportation; and manufacturing operations.

At Pantex as deputy general manager, Reichert provided leadership in all aspects of plant operations involving nuclear weapons, plutonium pit storage, high explosives, engineering, safety, security, emergency management, facilities management, quality, environmental protection and general administration.

At Y-12, Reichert served as vice president of environment, safety and health. She was the interpretive authority for environment, safety and health; waste operations; human performance improvement; behavior based safety; and integrated safety management.

Also at Y-12, she managed enriched uranium metalworking, production and manufacturing compliance and served as the program manager for modernization and as the operations manager of analytical chemistry.

Reichert holds a B.S. in biology/chemistry from Viterbo University in Wisconsin and an M.S. in radiological engineering/health physics from the University of Florida.

**TESTIMONY**  
**OF**  
**THE HONORABLE SEAN SULLIVAN, CHAIRMAN**  
**DEFENSE NUCLEAR FACILITIES SAFETY BOARD**  
*before the*  
**COMMITTEE ON ARMED SERVICES, SUBCOMMITTEE ON**  
**OVERSIGHT AND INVESTIGATIONS**  
**UNITED STATES HOUSE OF REPRESENTATIVES**  
**MARCH 16, 2017**

Chairwoman Hartzler, Ranking Member Moulton and distinguished Members of the Subcommittee, on behalf of the Defense Nuclear Facilities Safety Board, thank you for the opportunity to provide this statement for the record on the challenges and actions associated with the aging infrastructure within the Department of Energy's defense nuclear facility complex.

To begin, it may be useful to understand the roles and responsibilities of the Board. The Board is statutorily mandated to provide independent analysis, advice, and recommendations to the Secretary of Energy. Our analysis, advice, and recommendations inform the Secretary, in his role as operator and regulator of the Department of Energy defense nuclear facilities, in providing adequate protection of public health and safety at those facilities. The Atomic Energy Act of 1954, as amended, currently establishes two categories of facilities subject to our jurisdiction, generally described as: (1) those facilities under the Secretary of Energy's control or jurisdiction, operated for national security purposes that produce or utilize special nuclear materials; and (2) nuclear waste storage facilities under the control or jurisdiction of the Secretary of Energy. The facilities in the first of these categories are under the control of the National Nuclear Security Administration and are the subject of today's hearing. Some waste storage facilities in the second category are under NNSA's control, but most fall under the Department of Energy's Office of Environmental Management.

NNSA performs most of its high-risk activities in defense nuclear facilities. I should note, however, that defense nuclear facilities – that is, those that house a significant quantity of special nuclear material – comprise only a fraction of the total number of facilities under NNSA. For example, the campus of the Lawrence Livermore National Laboratory contains over seven hundred buildings, but fewer than 10 are defense nuclear facilities. Thus, we at the Defense Nuclear Facilities Safety Board can speak to the issues of aging infrastructure and deferred maintenance at high-risk defense nuclear facilities, but the total NNSA picture exceeds the scope of our jurisdiction.

For over a decade, the DNFSB has placed strong emphasis on maintenance of safety systems and management of aging infrastructure. In just the last few years, we have conducted on-site reviews of maintenance programs at several NNSA facilities, Board Members have visited sites to evaluate maintenance programs and aging infrastructure, we have held public hearings involving these topics at the Pantex Plant and the Y-12 National Security Complex, we have sent specific reports to NNSA on the maintenance programs at Pantex and the Sandia

National Laboratories, and we have sent a report to the Administrator on the structural integrity of aging production facilities at Y-12. In addition, we receive an annual written report and a briefing from NNSA staff on the safety of aging facilities at Y-12.

From our perspective, aging defense nuclear facilities present several potential safety problems that must be simultaneously managed: systems degrade with time, the risks associated with radiological hold-up within a facility increase with time, waste streams with no defined disposition path may accumulate over time, replacement parts for critical systems become unavailable as manufacturers go out of business or the technology becomes obsolete, and new or evolving missions require existing facilities to be used in ways for which they were not initially designed.

NNSA prioritizes maintenance at high-risk defense nuclear facilities and within facilities, prioritizes safety class and safety significant equipment and components. As a result, while NNSA has a significant maintenance backlog across all of its facilities, the deferred maintenance backlog at defense nuclear facilities is by comparison small. Nevertheless, many of these defense nuclear facilities are past or approaching the end of their design life and present aging challenges that are hard to quantify. Additionally, non-defense nuclear facilities – that is, NNSA facilities that do not contain special nuclear material – generally do have significant maintenance backlogs, and an accident such as a major fire in one of those facilities could pose a risk to a nearby defense nuclear facility.

Notably, aging infrastructure also has a hard-to-quantify, but no less real negative impact on human capital. No matter how much we as a nation invest in critical safety systems, the people who work at these facilities will always be both the first and the last line of defense against any accident. We hear from the management at NNSA sites that aging infrastructure poses challenges affecting recruiting and retention.

For the Board, in its role as an independent executive branch agency advising the Secretary of Energy on safety matters, the sheer number of issues caused by aging infrastructure is a concern. To the extent that a specific failure at a specific place can be anticipated, NNSA has demonstrated that appropriate action can be taken in reasonable time. Yet, the probability of a significant unanticipated failure only increases with time.

As I mentioned earlier, aging infrastructure presents several challenges that must be managed simultaneously. Let me give you some specific examples of facility conditions to highlight these challenges.

One challenge is that systems degrade with time. At Pantex, fire system piping that was initially laid underground beginning in the 1970s has been leaking. Since March 1996, the contractors that run the Pantex Plant have experienced 38 corrosion related failures of the high pressure fire loop, on average of 2.1 per year. NNSA has been funding repairs for several years, but they still have a long backlog. In recent years NNSA has also had to repair or replace some above ground fire system components at Pantex, including diesel fire pumps, fire detection elements and water storage tanks. Another example of degraded equipment is the process tanks

and piping in the 9212 Complex at Y-12. The tanks and piping hold chemical solutions containing fissile materials. Because of their advanced age, they are prone to leaks and spills.

Another challenge is the accumulation of waste materials with no defined disposition path. For example, the vault at the Plutonium Facility at the Los Alamos National Laboratory, also known as PF-4, has several hundred containers holding small amounts of special nuclear material for which NNSA has yet to determine an ultimate disposal path. These materials are typically the product of tests performed over several decades that resulted in unique waste compounds. Determining the additional processing needed to meet regulatory requirements for disposal has not been a high national priority. However, by continuing to house these materials, which have no defined programmatic use, the overall risk profile remains higher than it could be.

Still another challenge is the presence of systems that rely on technology that is obsolete. Los Alamos National Security, the contractor at LANL, recently learned that the manufacturer has discontinued production of circuit cards used to process pressure and temperature signals for display in the PF-4 operations center. The controller that contains these circuit cards will have to be replaced in the foreseeable future. As another example, building 332 at the Lawrence Livermore National Laboratory contains a ventilation system installed in the 1960s that uses pneumatic controllers. Building 332 is a part of the Superblock and houses activities important to the management of the nuclear stockpile. Replacement parts for the pneumatically controlled ventilation system are difficult to come by, and new technicians to maintain and calibrate this old technology must be painstakingly trained on the job.

The last management challenge I will mention is the use of aging facilities for new or evolving missions for which the facility was not initially designed. Simply put, new missions placed into existing facilities generally result in suboptimum configurations. An example of where this has occurred is at the LANL PF-4, built in 1978 for research and development is now the nation's only pit production facility following the shutdown of the plant at Rocky Flats in Colorado at the end of the cold war. Another example is at Y-12, where the contractor recently moved a critical radiography capability to Building 9204-2E, a facility constructed in the 1960s. Also at Y-12, the contractor plans to add metal production and purification capabilities to the 1950s-era facility known as the 9215 Complex. The addition of these capabilities at the 9215 Complex is needed in order to cease all operations in the even older, Manhattan Project-era 9212 Complex by the year 2025.

NNSA has provided us with updates on their efforts to address their many challenges. Examples of those efforts, include the capabilities that currently reside in two of NNSA's oldest defense nuclear facilities, the Chemical and Metallurgy Research Facility at LANL and the 9212 Complex at Y-12 will be moved into new or existing facilities. Nevertheless, near term risks in the CMR and 9212 facilities remain because of their advanced age and deficient structures.

Other action has been deferred. The Uranium Processing Facility (also known as UPF) at Y-12 was originally conceived as replacing the capabilities of Building 9204-2E and the 9215 Complex in addition to the 9212 Complex, but cost concerns forced the reduction of UPF scope to encompass only a partial replacement of the 9212 Complex. Meanwhile, Building 9204-2E and the 9215 Complex have known structural performance deficiencies and do not meet modern

structural design requirements. These deficiencies result in an increased potential for structural collapse and release of radiological material following certain seismic events. NNSA plans to operate in these buildings for at least two more decades, and in fact, as previously mentioned, the 9215 Complex will house new capabilities as part of the NNSA plan to end operations in the 9212 Complex.

Other action is still under evaluation. As noted previously, PF-4 at LANL evolved from a research and development facility in 1978 to a plutonium factory today. In 2007, NNSA discovered that the probability of a significant seismic event at Los Alamos was greater than previously anticipated, and since then NNSA has invested considerable resources in strengthening the facility. NNSA and the Board are still evaluating whether the improvements that have been either accomplished or firmly scheduled are sufficient for the long term. Both NNSA and the Board are also evaluating the potential seismic vulnerability of the PF-4 fire suppression system. As an aside, it is worth noting another control that could mitigate the consequences of the design basis seismic event would be an active confinement ventilation system that can be relied upon to protect the public during a design basis earthquake. An active confinement ventilation system is designed to assure continued function during and after an accident, thereby ensuring that radioactive material is captured by filters before it can be released into the environment. The Department of Energy standards did not require an active confinement ventilation system in PF-4 in 1978, but it would be included if it were built new today.

Other problems continue to raise concern even though they have been addressed. As noted above, corrosion-related failures have occurred in recent years to the site-wide High Pressure Fire Loop at Pantex. Corrosion-related problems have also developed in the fire suppression lines leading into the Device Assembly Facility at the Nevada National Security Site, and to the fire loop supplying the Tritium Extraction Facility at the Savannah River Site. While each of these has been addressed, it is reasonable to wonder what vital, in-ground system might fail next.

Water pipes and fire systems are not the only vital site-wide infrastructure systems needed for nuclear safety, and at NNSA sites, other site-wide infrastructure problems exist. Many site electrical systems are in need of updating or improvement.

To manage a multitude of issues, Y-12 site management in Oak Ridge started several initiatives beginning in 2006. One program is Continued Safe Operations Oversight Team. The CSOOT is composed of experienced Y-12 federal and contractor engineering, operations, and subject matter experts. CSOOT acts in an independent manner to provide an evaluation of enriched uranium operations risk and provides mitigating recommendations directly to senior management. We have maintained a high level of interest in this effort. In 2007, the DNFSB levied a reporting requirement for a formal, annual briefing on this subject. Since then, the DNFSB, NNSA, and the Y-12 contractor have conducted detailed discussions on CSOOT recommendations and aging infrastructure concerns at least annually.

Y-12 also has developed a detailed extended life program for Building 9204-2E and the 9215 Complex, the two facilities that were de-scoped from the UPF project. We found the

documentation of key safety basis-related assumptions, decisions, and scheduled activities to be a positive step. As a living document, the extended life program safety strategy will continue to evolve to provide additional specificity and refinement regarding the planned evolution of the 9215 Complex and Building 9204-2E safety bases. We will continue to monitor this program and identify any gaps between actual conditions and those required by the DOE order on nuclear facility safety. We will independently analyze for gaps in facility structure requirements, nuclear criticality safety requirements, ventilation confinement, and safety basis development strategy.

Lastly, NNSA recently spearheaded efforts to remove material at risk from all three buildings, reducing the inventory of material well below their allowable limits. All of these efforts have begun to significantly reduce risk at Y-12.

Two notes of caution about these programs for managing aging infrastructure. First, to use an automobile analogy, you can invest a lot of money in a 1952 Packard and perhaps make it run as smoothly and as safely as it did in 1952. Nevertheless, it would still be a 1952 Packard, lacking modern safety features such as air bags and reinforced side panels. There are some safety features that can be retro-fitted or risks that can be mitigated. The aging Y-12 facilities, while being better managed, lack some of the safety features that DOE's current standards would require if those facilities were being built new today. Second, Y-12 pioneered the efforts just mentioned out of necessity, as they had many of the oldest operational facilities in the NNSA inventory. Other NNSA sites have adopted some but not all of these practices. All sites will eventually have operating defense nuclear facilities as old as the Y-12 facilities are now.

Another reason to encourage the adoption of these Y-12 aging facility management practices and other best practices at other NNSA sites is that the inherent risks at other sites are likely greater than that at Y-12. The radiological hazards at Y-12 facilities are driven by the presence of uranium, whereas several of the other sites house operations in which the radiological hazard is driven by plutonium. Plutonium presents the potential for significantly greater public consequences if there were to be an accident and managing the risks to the greatest extent feasible is of key importance.

While NNSA remains vigilant in maintenance of its aging infrastructure, the fact remains that many of these facilities are more than 70 years old. Delays in NNSA's efforts to modernize its infrastructure exacerbate safety-related issues and require that ongoing work be performed in degrading nuclear facilities that do not meet modern safety standards. As DOE and NNSA develop new defense nuclear facilities we will continue to work closely with them as they progress with design and construction.

Chairwoman Hartzler, Ranking Member Moulton, thank you again for the opportunity to provide this testimony. We at the Defense Nuclear Facilities Safety Board look forward to working with this Subcommittee. I would be happy to answer any questions you may have.

**Sean Sullivan**  
**Chairman, Defense Nuclear Facilities Safety Board**

Mr. Sullivan is a graduate of the U.S. Naval Academy, and served as a U.S. Navy submarine officer for twenty-six years before retiring at the grade of Captain in 2006.

Mr. Sullivan served at sea aboard several submarines and commanded the USS Jefferson City. Ashore assignments included the Navy's Office of Legislative Affairs in Washington, DC, Deputy Commander of Submarine Development Squadron Twelve, and Submarine Force representative at Electric Boat in Groton. In his last Navy assignment, Mr. Sullivan served as commanding officer of the Naval Submarine Base New London where he provided leadership and oversight to base operations supporting eighteen nuclear powered submarines and approximately one hundred major facilities.

After leaving active duty, Mr. Sullivan practiced law as a civil litigation attorney for five years with the firm of Brown Jacobson, P.C. in Norwich, Connecticut in the areas of torts, employment law, land use, and municipal law. In 2011, Mr. Sullivan became a partner at Sonalysts, Inc. in Waterford, Connecticut where he provided direct support to the U.S. Navy Strategic Systems Programs Office for the Ohio Replacement (now, Columbia class) submarine.

Mr. Sullivan earned a bachelor's degree in marine engineering from the United States Naval Academy, a Master of Arts in National Security Affairs from the Naval War College and a law degree from the University of Connecticut. He is a member of the state bar of Connecticut. He served from 2009 to 2012 on the Ledyard Town Council in Ledyard, Connecticut.

Mr. Sullivan was appointed by President Obama to the Defense Nuclear Facilities Safety Board in April, 2012, and confirmed by the Senate in August 2012. The Defense Nuclear Facility Safety Board is an independent organization within the executive branch chartered with the responsibility of providing recommendations and advice to the President and the Secretary of Energy regarding public health and safety issues at Department of Energy defense nuclear facilities. Defense nuclear facilities are production facilities, utilization facilities, and waste storage facilities associated with the nation's nuclear weapons program. In January 2017, Mr. Sullivan was appointed Chairman of the DNFSB by President Trump.



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MARCH 16, 2017

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March 10, 2017

The Honorable Rick Perry  
 Secretary of Energy  
 U.S. Department of Energy  
 1000 Independence Ave., SW  
 Washington, DC 20585

Dear Secretary Perry:

The Oversight and Investigations Subcommittee of the House Armed Services Committee is hosting a hearing on March 16, 2017, titled "Oversight Review of Infrastructure Needs and Projects Ready for Immediate Implementation in the Nuclear Security Enterprise." We request your immediate and personal engagement to ensure that, at this hearing, Under Secretary for Nuclear Security Frank Klotz is able to present to the subcommittee a list of projects that could be immediately implemented in the near-term if Congress chooses to make funding available.

As you are aware, the National Nuclear Security Administration's (NNSA) nuclear security enterprise suffers from a staggering \$3.7 billion backlog in deferred maintenance and infrastructure needs. In 2009, a bipartisan, independent commission accurately described the nation's nuclear infrastructure as "decrepit"—and the problem has only grown worse. In recent years, the previous Administration and Congress have made it a priority to address these deplorable conditions. We simply cannot ask our nation's best and most brilliant scientists, engineers, technicians, and administrators responsible for our nuclear weapons to work in facilities dating back to the 1950s that are literally falling apart.

The hearing next week will focus on projects that can be undertaken immediately. We will use the hearing to discuss these infrastructure problems and look to secure the significant levels of funding needed to address them. We ask that you personally engage to ensure NNSA provides the subcommittee the list of projects we have requested because we believe it is essential to our mutual goal of supporting the nuclear enterprise and its people. In order for us to conduct proper oversight, this list must be provided before the hearing and should be of sufficient size and encompass all infrastructure projects that are currently at a point in their design lifecycle in which they would be ready for immediate implementation, regardless of whether or not the projects have yet been prioritized.

Thank you for your consideration of our request. We have enclosed some pictures of NNSA's infrastructure problems that were displayed at a hearing last September, 2016—we hope you will agree that these problems are as urgent and severe as we do.



Mike Rogers  
Chairman  
Strategic Forces Subcommittee

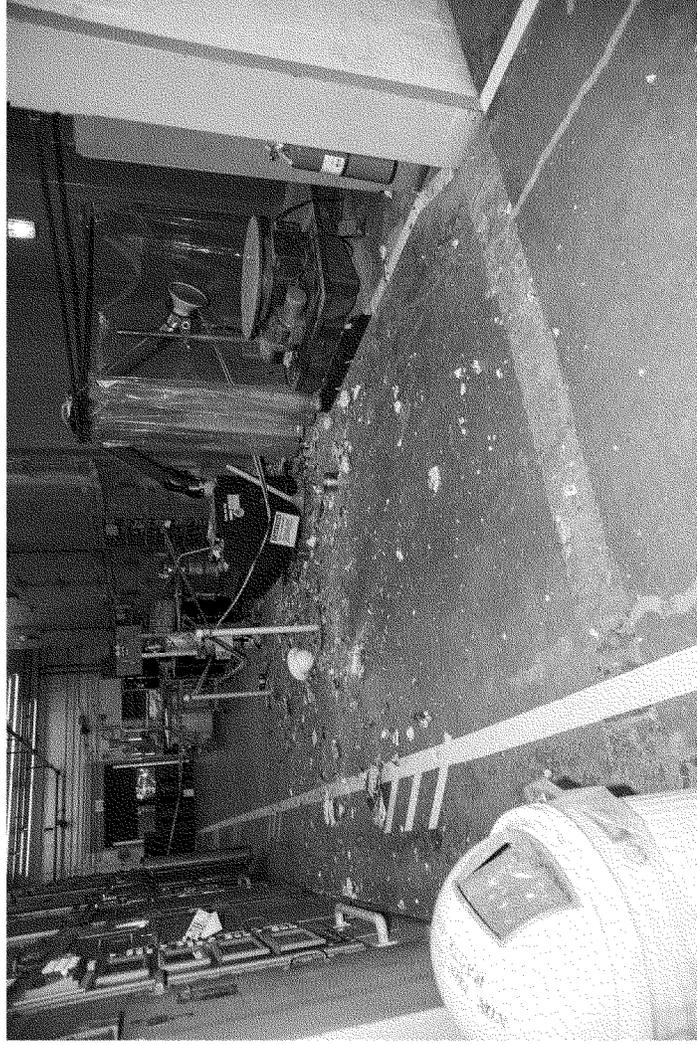
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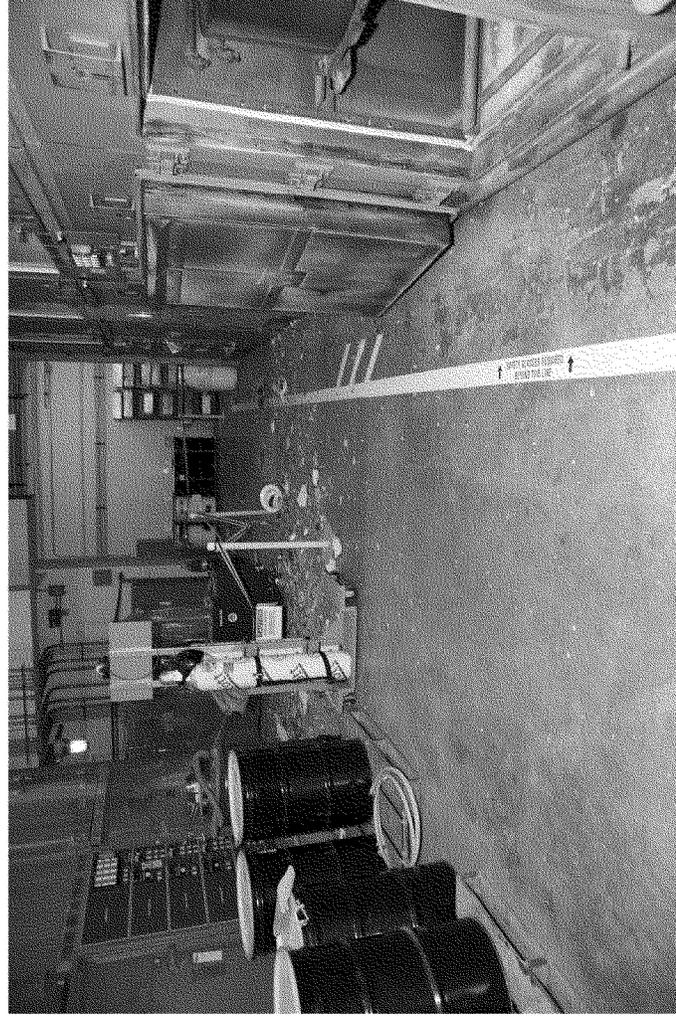
Vicky Hartzler  
Chairwoman  
Oversight & Investigations Subcommittee

Enclosure

**Decaying infrastructure at Y-12 -  
Fallen concrete incident**



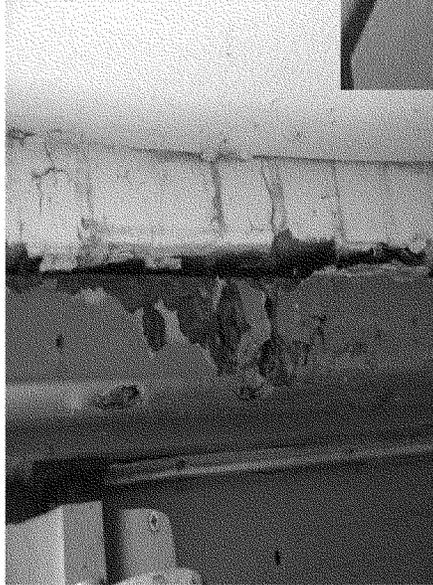
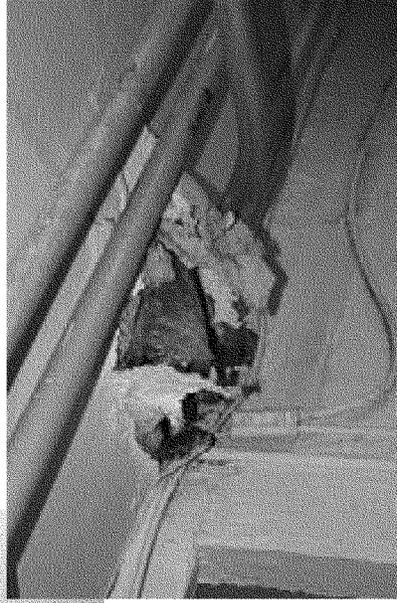
## **Decaying infrastructure at Y-12 - Fallen concrete incident**



**Decaying infrastructure at Y-12 -  
Fallen concrete incident**



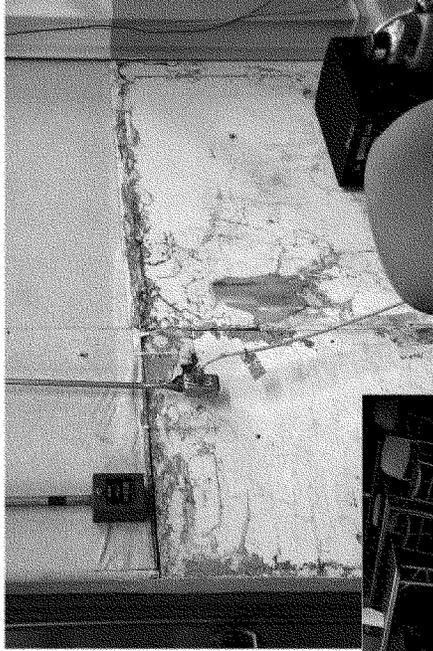
**Decaying infrastructure at Pantex**



## Decaying infrastructure at Pantex

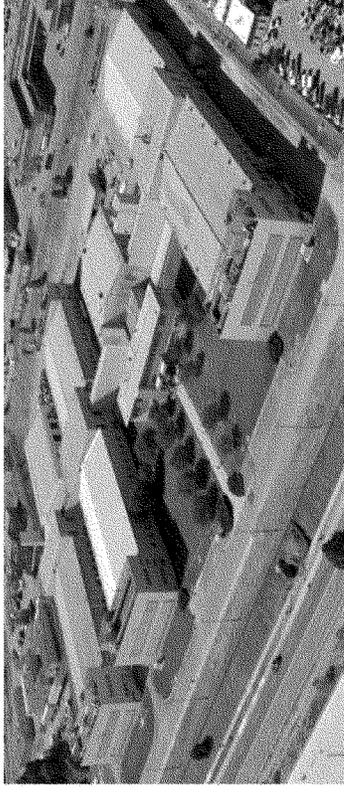


## Decaying infrastructure at Pantex

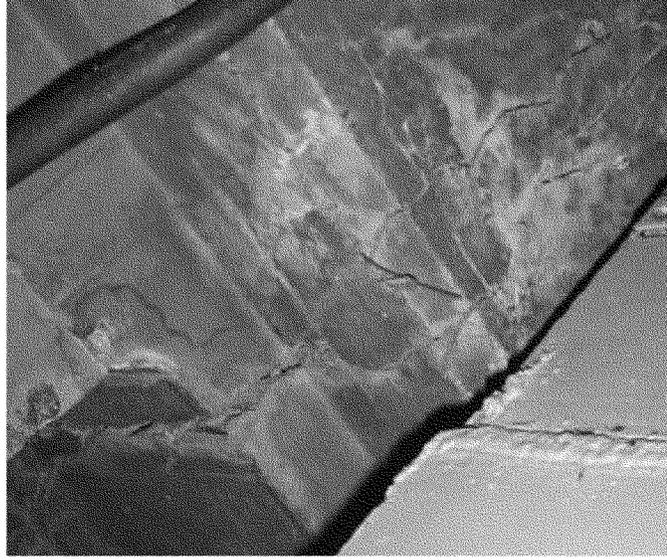
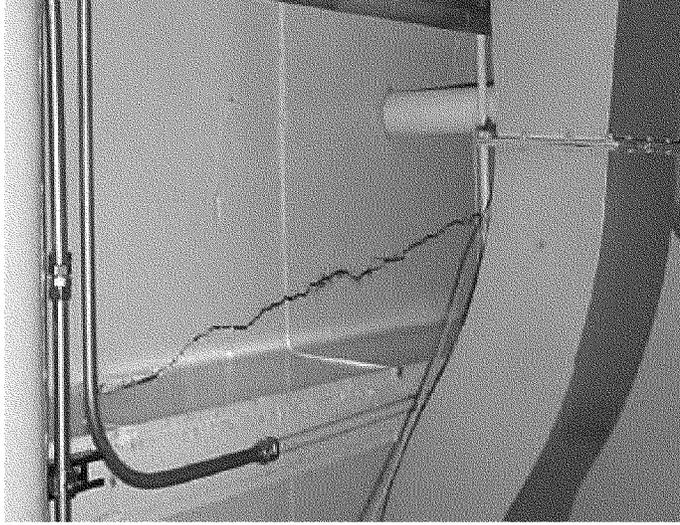


## **Overview of Los Alamos Lab Chemistry Metallurgy Research Building**

- Construction completed in 1952
- Supports mission-critical capabilities related to plutonium, supporting all aspects of nuclear weapons lifecycle
- Approximately 550,000 ft<sup>2</sup> on three floors, the largest laboratory facility at Los Alamos.
- Located directly above a geological fault-line



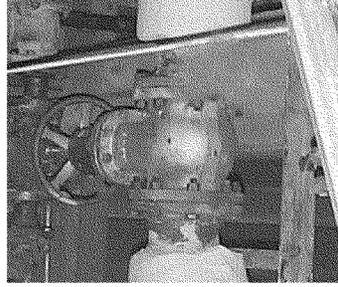
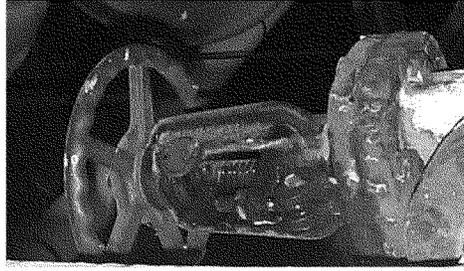
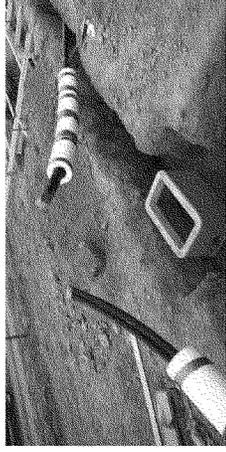
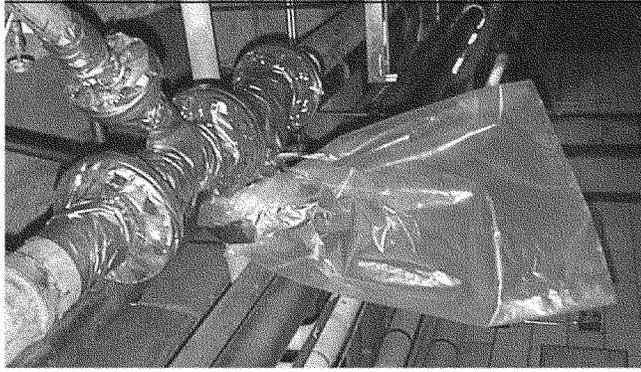
# Infrastructure decay at Los Alamos Lab Chemistry Metallurgy Research Building



# Infrastructure decay at Los Alamos Lab Chemistry Metallurgy Research Building



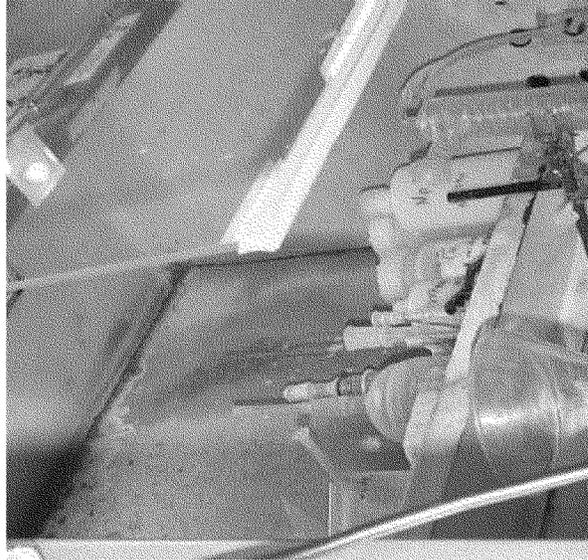
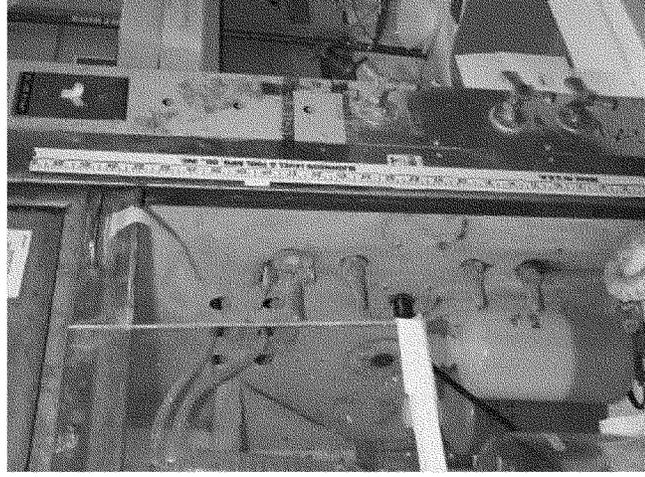
# Infrastructure decay at Los Alamos Lab Chemistry Metallurgy Research Building



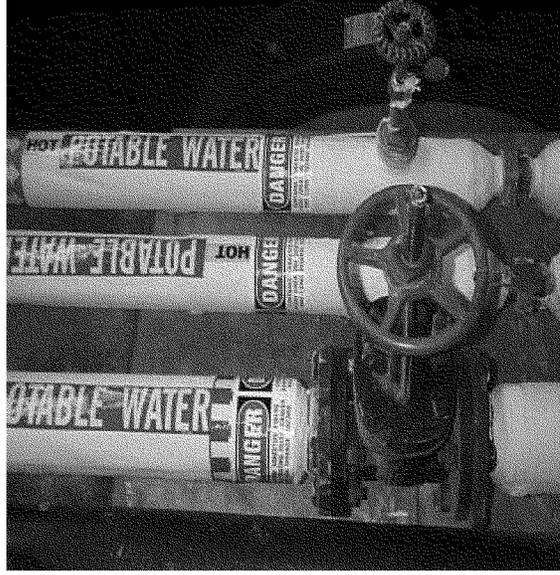
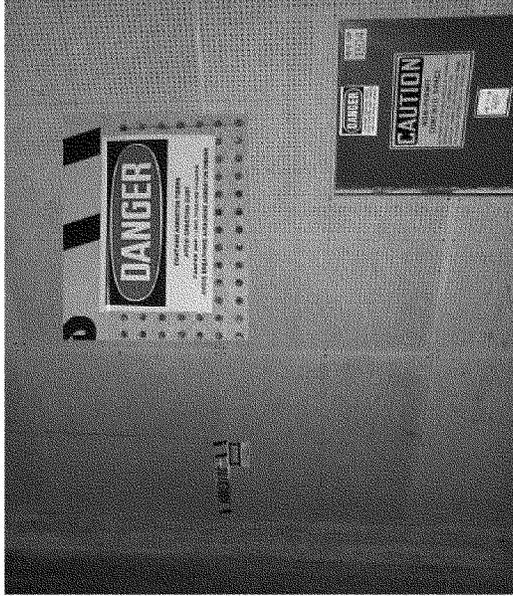
# **Infrastructure decay at Los Alamos Lab Chemistry Metallurgy Research Building**



# Infrastructure decay at Los Alamos Lab Chemistry Metallurgy Research Building



# Asbestos hazards at Los Alamos Lab Chemistry Metallurgy Research Building



## QUESTION FROM CHAIRMAN ROGERS

- Q19. Please provide the committee a comprehensive list of currently-unfunded infrastructure and Deferred Maintenance projects that NNSA could execute in the next several years, if provided increased resources.
- A19. As requested, NNSA is providing a list of currently unfunded Recapitalization projects that NNSA could execute in the next several years should additional resources be available. The list provided is unconstrained and builds from the project list included in the NNSA Fiscal Year 2017 President's Budget Request.

National Nuclear Security Administration Infrastructure and Safety Over Target FY 2017 Recapitalization Projects - October 2016			
Rank	Site	Project Name	Total Project Cost (\$K)
1	LLNL	Site 300 Electric Utility Display System Upgrade	\$7,000
2	LANL	LANSCe Sector A Tunnel Fire Suppression System Installation	\$3,000
3	LLNL	B132N HVAC System Variable Air Control Replacement	\$5,000
4	Y-12	Bldg 9204-2E Wet Pipe Systems 1&2 50 Year Sprinkler Head Replacement	\$5,500
5	Y-12	Bldg 9995 Air Handling Unit (AHU) 2000 Replacement	\$6,000
6	Y-12	Area 5 15 kV Underground Cable Replacement	\$5,000
7	KCP	Kirtland Ops NC-135 Site Disposition	\$4,900
8	LLNL	Bldg 175 Characterization	\$1,500
9	Y-12	Bldg 9204-2 Ceiling Concrete and Steel Inspection and Replacement	\$6,000
10	PX	Bldg 12-84E Generator Replacement	\$2,000
11	KCP	Bldg 2 Specialty Welding Applications Capital Equipment Replacement & Upgrade	\$1,200
12	LANL	PF-4 Vault Storage Renovation	\$7,500
13	LLNL	Utility Safety Upgrades to Plating Shop, B322	\$2,500
14	SNL	C914 Seismic Upgrades to Achieve Code Compliance	\$9,720
15	LLNL	Bldg 292 Characterization	\$2,000
16	LLNL	Site 200 and 300 Transition and Disposition of 48 Trailers	\$2,500
17	SNL	SNL -Hawaii Mt. Haleakala Disposition of 3 Facilities	\$934
18	LLNL	Site-Wide Low Conductivity Water System Station/Cooling Tower Replacement	\$6,000
19	LLNL	S200 Failing Underground Utility Valves & Water Distribution Piping Replacement	\$5,000
20	PX	Building 12-84E Generator Replacement	\$2,000

Rank	Site	Project Name	Total Project Cost (\$K)
21	SNL	C912 Major Building Renovation, Phase 3	\$5,000
22	LLNL	B131 Engineering's Cornerstone Office Building Upgrade	\$7,500
23	KCP	Product Testing Area Capital Equipment Replacement	\$2,490
24	SNL	Substation 5 Loop Upgrade, Redundant Feeder Installation	\$5,000
25	Y-12	9204-04 Deinventory	\$8,000
26	PX	Bldg 12-24E Chiller Replacement	\$2,000
27	LANL	Small Improvement Project in 3 Facilities (53-003,22-0005, 03-0039)	\$1,300
28	LLNL	B805 Classified Machine Shop Infrastructure Renovation	\$3,500
29	LANL	CMR Initial Facility Closure, Wing 2,3,5 and 7 Clean Up	\$1,500
30	LLNL	B327 Non-Destructive Evaluation Laboratory Renovation	\$2,500
31	LLNL	B391 HVAC Water Temperature Control Upgrade	\$3,000
32	Y-12	Re-line Failing Sections of Sitewide Potable Water Distribution Piping	\$8,000
33	LANL	TA-03-0102 Component Manufacturing Virtual Vault Type Room Installation	\$1,599
34	KCP	Production Area Renovations for Floor Space Optimization	\$2,143
35	LLNL	Disposition of Buildings B326, B221, & B221 Retention Tanks	\$2,000
36	SNL	C911 Renovation to Convert Office to Lab Space	\$5,000
37	PX	Bldgs 12-85 and 12-96 UPS Replacements	\$2,250
38	PX	Bldg 12-44 UPS Replacement & Equipment Room Reconfiguration	\$3,000
39	PX	Bldg 11-51 Generator and UPS Replacement	\$2,250
40	PX	Bldgs 12-98E1 and E2 UPS and Generator Replacement	\$3,000
41	LANL	Weapons Engineering Tritium Facility Glovebox and Systems Renovation	\$8,250
42	Y-12	Bldg 9720-82 (HEUMF) VESDA Installation	\$5,000
43	Y-12	9204-2E Criticality Accident Alarm System (CAAS)	\$4,500
44	LANL	D&D of the 100,000 gallon Single Walled Storage Tank (TA-50-90)	\$2,500
45	NNSS	Atlas Machine Removal	\$3,500
46	SNL	Coyote Test Field, Twin Tanks Piping Replacement	\$173
47	SNL	NM High Voltage System, Overhead Switch- SW-390 Replacement	\$153
48	SRS	HAOM Tritium Grab Sample Capability move to TEF	\$1,400
49	SNL	Natural Gas System, Tech Area I, Piping Replacement	\$1,194
50	LLNL	B332 Diesel Generator Replacement Project	\$1,500
51	SNL	Bldg 960 Chilled Water System Upgrade	\$2,950
52	LANL	PF-4 Fire Wall Upgrades	\$7,000
53	SRS	HANM Obsolete Oxygen Monitor Replacement in Loading Line 6 Glovebox (L6-O2)	\$1,815
54	SRS	HANM Obsolete Oxygen Monitor Replacement in Finishing Line 6 (F6-O2) Glovebox	\$1,815
55	LLNL	B806/B810 High Explosives Machining/Assembly – HVAC and Electrical DM reduction and recapitalization	\$4,773
56	SNL	NM Tech Area III/V, 14" Water Main Replacement	\$4,140
57	KCP	Bldg 2 Specialty Welding Applications Equipment Replacement and Upgrade	\$1,136

Rank	Site	Project Name	Total Project Cost (\$K)
58	NNSS	Water/Wastewater Systems - CP Hill Water Line Replacement	\$7,000
59	Y-12	Bldg 9212 50 Year Sprinkler Head Replacement (Wet Pipe System 009)	\$4,400
60	Y-12	Bldg 9204-02E Transformer, Interrupter, Switches & Underground Cable Replacement	\$2,000
61	SNL	Bldg 1012 - Battery Test Facility	\$8,000
62	PX	Bldg 12-104A Blast Door Interlock Programmable Logic Controller Replacement	\$2,000
63	Y-12	Bldg 9215 50 Year Sprinkler Head Replacement (Wet Pipe System 004)	\$1,700
64	KCP	Bldg 2 Special Application Machining and Welding Area Renovations	\$2,143
65	LANL	RLWTF Ground Water Permit Discharge Regulatory Requirements Mitigation (Zero Liquid Discharge Liner Replacement & Room 60 Configuration)	\$8,000
66	NNSS	New Mercury Consolidated Operations Complex Building 1 (23-460)	\$9,000
67	SRS	Workplace Improvements	\$500
68	LLNL	B321/B322 HVAC & Electrical Replacement	\$5,725
69	Y-12	Bldg 9212 Room 1022A Ventilation System Installation	\$1,000
70	LLNL	Site-wide Mechanical Utility Valves and Water Distribution Piping Replacement	\$5,000
71	Y-12	Bldg. 9212 302 Steam Supply Station and SF-302 Steam Coil Replacement	\$1,700
72	LLNL	B132/B321A/B451 Fire Protection Systems Replacement (DM)	\$4,360
73	SNL	SNL/CA Sanitary Sewer Replacements	\$7,000
74	NNSS	U1a Shaft Wood Lagging Replacement	\$8,100
75	LANL	PF-4 Fire Water Loop Component Replacements	\$7,395
76	NNSS	U1a Public Address System Replacement	\$3,000
77	KCP	Metal Tooling and Production Additive Manufacture Installation	\$9,000
78	SRS	HAOM to HANM Reservoir Assessment Relocation	\$6,200
79	Y-12	Bear Creek Road 13.8 kV Electrical Distribution Installation	\$8,600
80	KCP	Bldgs 2 & 3 Analytical Testing and Controls Capital Equipment Replacement and Upgrade	\$2,878
81	Y-12	Bldg 9204-02 Elevator #2 Replacement	\$3,000
82	SNL	NM High Voltage Power System, Substation 5 Loop Redundant Feeders Upgrade	\$3,180
83	NNSS	DAF Automated Energy Management System (AEMS) Replacement	\$6,700
84	LLNL	B222A Nuclear Explosives Package Device Component Engineering Laboratory	\$9,900
85	SNL	Bldg 878 (Process Development Lab) Renovation	\$8,500
86	Y-12	Bldg 9204-02 50 Year Sprinkler Head Replacement (Wet Pipe System 005)	\$3,800
87	Y-12	Bldg 9995 Chilled Water and Steam Condensate Piping Replacement	\$3,000
88	Y-12	Bldg 9212 50 Year Sprinkler Head Replacement (Wet Pipe System 007)	\$5,800
89	Y-12	Bldg 9215 Switchgear 253 Replacement	\$4,000
90	LLNL	B322 Plating Shop Utility Safety Upgrades	\$2,500
91	LLNL	B332 iCAM Alarm System Upgrade	\$1,000
92	Y-12	Bldg 9204-02 Stab-Lok and Fused Electrical Panel Replacement	\$1,900
93	LLNL	B131 High Bay HVAC Replacement	\$4,390
94	Y-12	Fire and Potable Water Replacement of 9 Laterals to Nuclear Facilities	\$3,000

Rank	Site	Project Name	Total Project Cost (\$K)
95	LANL	SM-39 Classified Machine Shop Upgrade	\$4,000
96	Y-12	Demineralized Water Delivery System Replacement	\$7,500
97	Y-12	Bldg 9995 Supply Fan Replacement/Refurbishment	\$5,000
98	LLNL	B805 S300 Classified Machine Shop Ventilation & Utility Renovation	\$3,500
99	LANL	PF-4 Fire Water Loop Component Replacements (Pumps & Boiler Replacement)	\$7,105
100	SRS	Analytical Lab Relocation From 234-H to 264-H	\$3,000
101	LLNL	Site 300 Storm Water Safety Improvements & Erosion Control (Elk Ravine)	\$4,925
102	NNSS	DAF Domestic Water System Upgrade	\$4,700
103	NNSS	U1a Lightning Protection Upgrades	\$1,900
104	LANL	TA-16-0303 Renovation for Crystal Lab Relocation	\$3,000
105	PX	Bldg 12-31 HVAC and DH Replacement	\$4,500
106	NNSS	DAF Electrical Substations Upgrade	\$5,500
107	PX	Bldg 12-85 and 12-96 UPS Replacement and Generator Installation	\$2,000
108	PX	Bldg 12-126 HVAC Replacement	\$4,500
109	KCP	Bldg 2 Assembly, Electrical & Fabrication (AEF) Capital Equipment Replacement and Upgrade	\$2,079
110	LLNL	B151 Renovation of 4 High Level Radiochemistry Laboratories (Anteroom renovation)	\$4,655
111	KCP	Bldgs 2 & 3 Non-destructive Testing Capital Equipment Replacement and Upgrades	\$2,490
112	KCP	Bldg 2 Paint and Heat Treat Capital Equipment Replacement	\$2,575
113	LLNL	Sustainable Chilled and Heating Hot Water Systems Modernization	\$3,000
114	PX	Lightning Protection System Upgrade for 10 MAA Facilities	\$8,000
115	KCP	Bldgs 2 & 3 Special Materials Production and Rubber and Plastics Capital Equipment Replacement and Upgrade	\$2,986
116	PX	Bldg 12-98 UPS Replacement and Generator Installation	\$3,000
117	KCP	Bldgs 2 & 3 Environmental Testing and Controls Capital Equipment Replacement and Upgrade	\$2,754
118	LANL	TA-53-0003 (LANSCE) Fire Suppression System in Accelerator Tunnel Installation	\$5,800
119	LLNL	B170 Upgrade Classified Computing and Communications	\$2,500
120	PX	Bldg 11-55 UPS & Generator Replacement	\$2,000
121	KCP	Bldgs 2 & 3 Paint & Heat Treat and Rubber and Plastics Area Renovations	\$1,654
122	LANL	Firing Sites Confinement Vessel Building Construction	\$8,750
123	PX	Bldg 12-104A Uninterruptible Power Supply Replacement	\$1,500
124	KCP	Bldgs 2 & 3 Assembly, Electrical & Fabrication and Environmental Testing Area Renovations	\$2,289
125	PX	Bldg 12-99 UPS Replacement	\$1,500
126	PX	Bldg 12-94 UPS Replacement	\$1,500
127	KCP	Bldgs 2 & 3 Process Marking and Printing Applications Capital Equipment Replacement and Upgrade	\$2,785

Rank	Site	Project Name	Total Project Cost (\$K)
128	PX	Bldg 12-121 OMI & BDI Controller Replacement	\$4,000
129	PX	Bldg 12-104 Blast Door Interlock PLC Replacement	\$4,000
130	PX	Bldg 12-86 Uninterruptible Power Supply Replacement	\$1,500
131	PX	Bldg 12-130 Generator and UPS Replacement	\$1,500
132	PX	Bldg 12-121 UPS Replacement	\$1,250
133	NNSS	Mercury Sewer Lines Replacement	\$8,450
134	LLNL	Bldg 28XX Complex Disposition of 4 trailers	\$2,500
135	Y-12	Bldg 9201-05 Deinventory	\$20,000
136	Y-12	Bldg 9202-04 Deinventory	\$1,000
137	LANL	TA-16-0306 Characterization	\$2,000
138	NNSS	Mercury Bldgs 23-517 & 23-B, 23-C, 23-D Disposition	\$2,000
139	NNSS	Mercury Disposition of 10 facilities	\$2,400
140	SRS	Bldg 236-H shutdown	\$2,000
141	PX	Bldg 11-029 Shutdown	\$2,600
142	LLNL	Bldg 363 Biomedical Laboratory Disposition	\$1,000
143	NNSS	Area 6 Disposition of 5 facilities	\$1,000

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**WITNESS RESPONSES TO QUESTIONS ASKED DURING  
THE HEARING**

MARCH 16, 2017

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## RESPONSES TO QUESTIONS SUBMITTED BY MR. SUOZZI

General KLOTZ. Since the end of the Cold War, the nuclear security enterprise has contracted significantly, including eliminating unnecessary redundancies. For example, in 1994 the Department of Energy ceased operations at the Rocky Flats Plant in Colorado, where plutonium pits were produced. Similarly, operations at the Pinellas Plant in Florida, where neutron generators were produced, ceased in 1997. Operations were also ceased at the Mound Site in Ohio in 2003, where beryllium initiators were manufactured and used in early atomic weapons. More recently, NNSA moved operations of our Kansas City Plant from the aging Bannister Federal Complex to the modern, efficient Kansas City National Security Campus (KCNSC), reducing the KCNSC footprint from 1.5 million gross square feet to 2.9 million gross square feet.

Although the current enterprise is extensive and complex, each NNSA site fills a unique role and responsibility. Therefore, further consolidation of NNSA sites is not anticipated at this time. However, NNSA is making investments to improve the efficiency and responsiveness of our infrastructure. For example, NNSA is recapitalizing the facilities that support strategic materials capabilities with projects such as the Chemistry and Metallurgy Research Replacement project at Los Alamos National Laboratory (LANL) and the Uranium Processing Facility at the Y-12 National Security Complex. Both projects will move operations from degraded facilities into newer buildings, increasing the responsiveness of the enterprise.

Additionally, current and future support to readiness and responsiveness is provided through investment in vital general purpose infrastructure projects, such as the TA-3 Substation Replacement project at LANL. This project, which began in FY 2016, will replace a dilapidated and increasingly unreliable system with a modern, reliable, and robust system that is easier and more cost effective to maintain and operate. The new substation will reduce deferred and emergency maintenance, improve safety, and upgrade and increase power import capacity to support new programs. [See page 14.]

General KLOTZ. NNSA collaborates with other Federal agencies to implement proven systems and tools to improve NNSA's infrastructure. During the past several years, for example, NNSA has been collaborating with the U.S. Army Corps of Engineers (USACE) to implement the BUILDER Sustainment Management System, which has been recognized by the National Academy of Sciences as a best-in-class practice for infrastructure management. BUILDER is a web-based software tool to help decide when, where, and how to best maintain, repair, and recapitalize infrastructure. The tool uses preexisting engineering data to predict facility and component conditions, prioritize maintenance work, and support analysis of different spending scenarios. NNSA's full implementation and sustainment of BUILDER is planned to be achieved in 2018.

Additionally, NNSA developed a new customized Mission Dependency Index (MDI) based on models used by the Marine Corps, Coast Guard, and Navy. NNSA's new MDI measures the "consequence to mission" by combining the impact to mission if an asset were lost, the difficulty to replace the asset, and the interdependency of assets to calculate a score from one to 100. As a result, MDI provides much greater insights into prioritization of risks, opportunities, and investment decisions than prior analytical tools. [See page 14.]

General KLOTZ. NNSA always selects between leveraging public-private partnership financing or line item construction based on what is in the best interest of the government. NNSA uses OMB Circular A-11 and A-94 standards as guidance for such assessments, and when appropriate consults with the General Services Administration (GSA). As part of our improved project management initiatives, NNSA implements a comprehensive Analysis of Alternatives process to help inform many of these decisions.

For example, NNSA recently selected a third-party financing solution to construct the Pantex Administrative Support Complex in Amarillo, Texas, based on an assessment that such an approach would be in the government's best interest. In contrast, NNSA determined that line item construction was in the government's best interest

for the new Albuquerque Complex, the Federal administrative building in Albuquerque, New Mexico. [See page 15.]

General KLOTZ. NNSA continues to study ways to improve the efficiency and effectiveness of our operations. We will be working to vet proposals within the new Administration to decide what specific steps would be most helpful going forward. [See page 15.]

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**QUESTIONS SUBMITTED BY MEMBERS POST HEARING**

MARCH 16, 2017

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### QUESTIONS SUBMITTED BY MRS. HARTZLER

Mrs. HARTZLER. General Klotz, what are the consequences to the U.S. government and taxpayers if we do not close the deal on the Bannister Road Complex in Kansas City soon? What if we do not get this \$200 million appropriated here in FY2017?

General KLOTZ. NNSA requires \$200 million in FY 2017 to transfer ownership of the Kansas City Bannister Federal Complex—a high-risk, excess facility formerly home to the Kansas City Plant—to a private developer for demolition, remediation, and redevelopment. If the FY 2017 transfer window is missed, the private developer may walk away from the project, preventing NNSA from transferring the property. In the event the transfer is missed, NNSA will be required to carry the Bannister Federal Complex until disposition, which is estimated to cost between \$8 million–\$10 million per year. Additionally, NNSA may need to invest in improvements to keep the facility in stable condition until eventual disposition. The extent of these facility stabilization investments will vary significantly depending on the long-term disposition plan (e.g., disposition in several years versus 10 years or more). Additionally, the full extent of future funding requirements cannot be estimated due to unforeseeable emergent failures, such as a recent water main break in February 2017. Ultimately, if the Federal Government is required to complete the demolition and remediation, the cost is expected to be approximately \$900 million.

Mrs. HARTZLER. General Klotz, you've said several times to this committee and the public: "I can think of no greater threat to the nuclear security enterprise than the state of NNSA's infrastructure." This is a tremendously important statement and one that Congress and the American people need to internalize. Would you please elaborate on why you say this? And what you believe must be done?

General KLOTZ. Infrastructure plays a vital, cross-cutting role in enabling NNSA's multiple national security missions, from ensuring the reliability of the U.S. nuclear deterrent to reducing the threat of nuclear proliferation and nuclear terrorism. Much of our infrastructure dates to the Eisenhower Administration, and in some cases the Manhattan Project era. Failure to revitalize this antiquated infrastructure presents significant risks to our ability to deliver missions effectively and efficiently, expand our capabilities and production capacity, and attract and retain new employees. Furthermore, without adequate investments, NNSA's infrastructure can pose safety risks to our workers, the public, and the environment. The breadth of these impacts informs my assessment that there is no greater risk to NNSA's missions than the current state of our infrastructure. Yet, although it has presented significant challenges, NNSA infrastructure has successfully enabled execution of the mission to date, and we are taking steps to address known challenges.

The establishment of the Office of Safety, Infrastructure, and Operations in January 2015 was the first action of many to improving the state of NNSA's infrastructure. This new organization enables NNSA to focus on identifying infrastructure gaps and risk, responding to emergent needs as they arise, and improving NNSA infrastructure over the long term. Within the Office of Safety, Infrastructure, and Operations, NNSA has two programs that target investments to improve the condition of infrastructure and reduce programmatic and safety risk:

- Maintenance and Repair of Facilities; and
- Recapitalization: Infrastructure and Safety.

NNSA began requesting and receiving additional funding for maintenance and recapitalization activities starting in FY 2015. Sustained, predictable, and increased investments in these two programs along with strategic investments for new construction are needed to improve the condition of NNSA's infrastructure.

Additionally, the Office of Defense Programs also employs a smaller recapitalization program, Capability Based Investments (CBI), focusing on managing risks in existing capabilities by prioritizing investments to upgrade and improve the reliability, efficiency, and capability of programmatic equipment and associated infrastructure.

Mrs. HARTZLER. One of the many unique elements necessary for the proper maintenance and operation of the nuclear stockpile is beryllium. This strategic and critical material, along with its cousin, beryllium oxide, cannot be replaced without significant risk to our nuclear deterrent. Is NNSA, and especially Los Alamos National

Laboratory, exploring ways to ensure that its requirements for beryllium and beryllium oxide will be met in a cost-effective and efficient manner in the coming decades?

Dr. McMILLAN. Beryllium and beryllium oxide are critical materials for the stockpile. Replacement with acceptable alternative materials would pose a significant technical challenge and potential risk to as-designed and tested performance. Ensuring the necessary infrastructure for the manufacture and supply of beryllium and beryllium oxide is vitally important to stockpile stewardship. The Laboratory has maintained beryllium fabrication capabilities, but relies on industry for supply. The National Nuclear Security Administration (NNSA) has assigned staff to oversee beryllium supply issues. The Laboratory has also conducted preliminary studies to help identify cost-effective technical solutions and produced a strategy document currently under review by NNSA. An essential part of that strategy is to examine potential long-term and cost-effective partnerships with industry to provide additional capabilities for the nation.

Mrs. HARTZLER. Dr. McMillan, would you please elaborate on your suggestions for new authorities, streamlined processes, or other actions the government could take to more efficiently and speedily address NNSA's massive infrastructure problems? Are there particular statutes, regulations, policies, or processes that should be revisited and streamlined (or eliminated)?

Dr. McMILLAN. Broadly speaking, there are three steps in the infrastructure process where streamlined approaches would be of help:

- Obtaining funding
- Planning and obtaining approvals on the work and
- Construction. The table below summarizes a recommendation for the funding stage for each major level of project.

Current Funding Limits	Funding Type	Relative Utility towards infrastructure	Recommendation
Up to \$10M	General Plant Project (GPP)	Most useful method for small projects	Consider increasing limit to \$30M and index to inflation
>\$10 M	Major Item of Equipment (MIE)	Most useful for replacing process equipment and facility support systems	Enable process tailoring by acquisition official to streamline or exempt like for like replacements of equipment from 413 management processes.
>\$10 M	Line Items	Used only when there is no other alternative	For Line Items below \$50M, eliminate Analysis of Alternatives, Independent Cost Evaluations, and require NNSA to make Critical Decisions within 30 days from Submittal Dates.

Mrs. HARTZLER. Ms. Reichert, would you please elaborate on your suggestions for new authorities, streamlined processes, or other actions the government could take to more efficiently and speedily address NNSA's massive infrastructure problems? Are there particular statutes, regulations, policies, or processes that should be revisited and streamlined (or eliminated)?

Ms. REICHERT. As I testified, it would significantly increase efficiency and safety if operating lease language in OMS Circular A-11, Appendix B was relaxed to reinstate a viable lease-to-own option and allow third-party financed projects like the Pantex Administrative Support Complex to be scored by OMS as an operating lease. It would also be beneficial if the Congressional cap on NNSA line item projects was increased from \$10 million to \$25 million, and if regulations were changed to allow NNSA to move \$10 million across control points per site with notification (up from \$5 million).

In addition to these provisions, there are several other actions that would help address infrastructure issues at the sites. These include:

- Permitting NNSA to consolidate Consolidated Nuclear Security, LLC, (CNS) cost savings from various control accounts into infrastructure improvement initiatives under \$25 million with notification to Congress.
- Altering the 1931 Davis-Bacon Act with language that would grant flexibility in making wage determinations in order to allow the use of the most appropriate labor resource and the use of prevailing rates. Currently, the act applies to "contractors and subcontractors performing on federally funded or assisted contracts in excess of \$2,000 for the construction, alteration, or repair (including

painting and decorating) of public buildings or public works.” At a minimum, the act should be updated to reflect a meaningful financial threshold to trigger action. A sum of \$2,000 in 1931, when the bill was passed, is equivalent to \$125 in 2017.

- Reducing the number of control points for stockpile systems to allow more flexibility to accommodate changing requirements and increased efficiency.
- Repealing 40 CFR 761 and include Polychlorinated Biphenyls (PCBs) under Resource Conservation and Recovery Act (RCRA) rules for management of hazardous wastes, eliminating separate management and administrative requirements for PCBs and hazardous wastes.
- Amending Clean Water Act Section 404 and related regulations to limit federal agency jurisdiction to high quality wetlands larger than one acre, an increase from the current requirement for permits on wetland disturbance greater than one-tenth of an acre.
- Removing emergency stationary engines from 40 CFR Part 60 Subpart 1111 and 40 CFR Part 63 Subpart ZZZZ from air permitting rules because of their limited use and limited amount of pollutants emitted to the atmosphere.
- Eliminating application of the RCRA “mixture” and “derived from” rules under 40 CFR 261.3 to the management of environmental media (soil, water) and treatment residues that otherwise might contain RCRA “listed” wastes. As currently applied, these rules cause soil and groundwater that contain any detectable quantity of a “listed” waste to be managed as a hazardous waste.
- Altering the McKinney-Vento Act to allow the United States Department of Housing and Urban Development (HUD) assessments for homeless occupancy of buildings scheduled for demolition to occur on a site-by-site basis rather than building-by-building, eliminating the need for hundreds of redundant reviews.

Mrs. HARTZLER. Ms. Reichert, would you please provide information to us regarding successful public-private partnerships and third-party financing arrangements that have been used at Pantex and Y-12? What were the cost and benefits to the U.S. Government for the Jack Case Center, the Pantex Administrative Support Complex, and other examples?

Ms. REICHERT. The Jack Case/New Hope Center project at the Y-12 National Security Complex was a third party financed project that provided 550,000 square feet of new administrative/office space to replace aged, deteriorated 1940s-era facilities. Y-12 staff moved into the new facilities in 2007. The Administrative Support Complex project at the Pantex plant provides 343,000 square feet of administrative/office space and will be accomplished by the same third party financing process, replacing aged, deteriorating facilities. It will be ready for occupancy in the spring of 2018.

The primary advantages of this third party financing approach are: 1) a shorter construction schedule (by two to three years); 2) a reduced construction cost (by about 25 percent); 3) the flexibility to vacate the lease with a one-year notification; and 4) allowing federal line item funding to be focused on recapitalizing mission-critical processes and facilities. Through this approach, the facilities can be constructed faster and more economically by using commercial standards and construction practices while not being constrained by a staged decision-making process and federal budget cycles where budget appropriations are received annually.

The modern facilities allow increased operational efficiency by co-locating technical and administrative staff, as well as helping to attract, retain, and motivate workers. In both the Y-12 and Pantex projects, NNSA evaluated and approved mission need and performed a thorough analysis of alternatives to select the best acquisition option. This was followed by developer solicitation, proposal evaluation, and developer selection. In both cases, the developer performed 60 percent design and developed a guaranteed maximum price to allow project review and approval.

Financial Benefits	<ul style="list-style-type: none"> <li>• Reductions to Maintenance costs: Enable banking of square footage, interchangeability between banked square footage space types, and exemptions for legitimate construction needs over the baseline would alter the incentive structure away from maintaining ageing and excess facilities until they are aligned with construction efforts.</li> </ul>
Technical Benefits	<ul style="list-style-type: none"> <li>• Integration of longer-term solutions to space reduction allows mission needs to be met while optimizing utilization of space.</li> </ul>
Other Benefits	<ul style="list-style-type: none"> <li>• Acceleration of demolition Efforts: Allowing for greater site flexibility would allow for better incentive structures to encourage contractors to aggressively pursue demolition without having to absorb mission risk for not having the square footage to construct replacements.</li> </ul>

Mrs. HARTZLER. Ms. Reichert, please describe the Material Staging Facility project at Pantex. What are the expected costs and benefits of this project? What cost savings/avoidances are likely to be realized by eliminating the need for recap-

talizing Zone 4 at Pantex and shrinking the size of the protected area? How would security and safety be improved by eliminating the need for intra-site transportation of weapons and components? What is the status of this project and when will it be initiated, constructed, and opened?

Ms. REICHERT. The Material Staging Facility has received mission need approval (Critical Decision 0) from NNSA and is beginning the requirements validation and analysis of alternatives phase. At Critical Decision 0 submittal to NNSA, the preliminary estimate for the facility was \$179M to \$714M with a point estimate of \$357M (range of -50 percent to +100 percent of point estimate). This estimate is based on very preliminary information; as the project proceeds, existing designs for similar Air Force base facilities will be examined for direct applicability and potential cost savings.

Cost savings projected over a 50-year period approach \$2 billion. Primarily, we would avoid having to replace deteriorating Pantex Zone 4 facilities (including the development of additional storage space as the current facilities approach maximum capacity) and the Zone 4 Perimeter Intrusion Detection & Assessment System (PIDAS), which is estimated to cost between \$81-322 million. It would also avoid costly material transport between separated Protected Areas and reduce operating, maintenance, and protection costs. Security would be greatly improved by having material storage and staging directly coupled to the assembly/disassembly operations at the Pantex Plant rather than having to transport material several miles. Assuming the project can complete the analysis of alternatives and receive FY 2019 capital funding, the earliest facility completion would be FY 2023.

#### QUESTIONS SUBMITTED BY MR. ROGERS

Mr. ROGERS. Mr. McConnell, would a FIRP-like program, with special authorities to quickly pursue key projects, provide added value to NNSA's infrastructure recapitalization efforts? What special authorities could be included in such a temporary program?

Mr. MCCONNELL. During the last several years, NNSA restructured our budget to provide clarity and focus on infrastructure investments consistent with what was achieved under the Facilities and Infrastructure Recapitalization Program (FIRP). The two FIRP-like programs that address deferred maintenance today are:

- Maintenance and Repair of Facilities; and
- Recapitalization: Infrastructure and Safety.

Sustained, predictable, and increased investments in these two programs, rather than the creation of a separate program, are needed to improve the condition of NNSA's infrastructure and reduce deferred maintenance.

The Administration will consider changes to existing authorities that could help NNSA implement infrastructure improvements faster and more efficiently to eliminate deferred maintenance and arrest the decline of infrastructure. We look forward to engaging Congress when and if specific legislative changes are sought by the Administration.

Mr. ROGERS. Mr. McConnell, does NNSA have metrics or ways to measure the inefficiencies or costs that are being borne because of the existence of very old buildings and a very large backlog of deferred maintenance? What are those costs, as a rough order of magnitude estimate?

Mr. MCCONNELL. NNSA is investigating new measures to give greater insight into the costs and inefficiencies caused by the declining state of infrastructure. A clear indicator of costs borne from old and declining facilities is the annual carrying cost of excess facilities. NNSA spends approximately \$50 million annually for excess facility maintenance, surveillance, and stabilization to keep the facilities in safe and stable condition until eventual disposition.

Mr. ROGERS. Dr. McMillan, how would you improve DOE and NNSA's approach to managing risk? Are mission risks being appropriately weighed and balanced against operational risks and other types of risk? Is there an appropriate process for elevating such risks to senior levels and getting timely decisions? How should this be structured?

Dr. McMILLAN. There are many forms of risk present in the NNSA portfolio. Two areas of specific concern are mission/program risk and operational risk. Over the past twenty years, the NNSA has developed a robust, but cumbersome and expensive system for managing operational risk, which has had some positive effect on the rate of NNSA safety incidents. This system can also limit productivity in the constant pursuit of engineered facilities regarded as "perfect". An overemphasis on operational risk can actually increase mission risk. The process to improve infrastructure is a good example of unbalanced risk. Regulatory requirements and long

government deliberations for new facilities increase costs and delay the acquisition process. As a result, fewer facilities are built and those in construction take too long to complete. The net result is the prolonged use of older, aging facilities and increased safety and mission risk from extended use. For example, NNSA and its predecessor organizations have been actively trying to replace the capabilities from the Chemistry and Metallurgy Research (CMR) facility since 1984, a process that will now likely extend to near 40 years. There are limited incentives in government to make timely and balanced risk decisions. Often, as a result of multiple layers of reviews, the most conservative accident scenarios and solutions are chosen that lead to increased project costs and delays. Elevating risk decisions can sometimes lead to multiple layered reviews adding to the time to make decisions. Because NNSA Defense Programs is responsible for the budget funding these projects, we suggest that the responsibility for balancing program, operational and project risk reside there. There is a desire on the part of Congressional appropriators to have projects that never exceed budget even though the project costs are often forecasted years earlier. This creates pressure on NNSA to always request more funding than is needed to ensure that projects never overrun. This conservative behavior leads sometimes to fewer projects being requested than are needed because not enough funding is available to guarantee all the project's success.

Mr. ROGERS. Dr. McMillan, how would you suggest enforcing a lockdown of safety requirements during development and design of a large construction project? At what phase/stage of the project should all requirements be locked? What level of senior official approval should be required after that stage to make changes to such requirements? Can you provide an specific example where changing requirements late in a project has led to increased costs?

Dr. McMILLAN. The philosophy of safety through integration in design is being carried to extremes. The interpretation of how requirements are applied sometimes changes during the development of the safety basis documents. Improved consistency in risk acceptance across government could be achieved by revising DOE Standards and Orders to reflect industry standards wherever possible and to seek consistency with other non-DOE regulatory, risk acceptance requirements (e.g., Nuclear Regulatory Commission (NRC), Occupational Safety and Health Act (OSHA) to reduce costs and provide adequate risk reduction.

*a) How would you suggest enforcing a lockdown of safety requirements during development and design of a large construction project?*

Lockdown of reasonably conservative safety requirements early in projects can improve the likelihood of project success. Imposing additional safety requirements at later stages of the project leads to increased costs and extended schedules. After CD-1, given that our current process is conservative by design, any additional requirements should be accompanied by a cost-benefit analysis and a proposal for a cost-neutral impact to the project. If the additional requirement is not cost neutral, then it should not be implemented unless it addresses a previously unidentified gap that must be closed. The project manager and program owner must be empowered to examine these requirements as they are gathered and compile a reasonable list of applicable requirements.

*b) At what phase/stage of the project should all requirements be locked?*

The current practice of locking in controls at the Critical Decisions stage is appropriate. Design requirements, including code-of-record (COR), are locked down at the declaration of conceptual design (CD-1). Credited safety class and safety significant Systems, Structures and Components (SSC) are supposed to be locked down with approval of a Preliminary Documented Safety Analysis (PDSA) (CD-2). As previously stated above, the lockdown of safety requirements should be viewed as conservative at these stages and the expectation should be made clear that the final set of controls identified in the Documented Safety Analysis (DSA) (CD-4) can be reduced from the controls in the PDSA when assumptions and uncertainties about facility operations are better known. Reliance on appropriate Specific Administrative Controls (SACs) and Initial Conditions in the DSA should also be expected as an appropriate means to augment expensive engineered controls. Relying only on engineered controls may not be affordable.

*c) What level of senior official approval should be required after that stage to make changes to such requirements?*

As discussed earlier, any increased changes to safety requirements or credited controls should be subjected to a cost benefit analysis and not implemented if they increase total project costs and provide marginal improvements in safety. Any increase must be elevated to the National Nuclear Security Administration (NNSA) Administrator for approval and resolved quickly (time is money). To support these decisions, reductions in mandated Code of Record requirements may require an exemption request, which should be approved by the local safety basis approval au-

thority. Currently all exemption requests must be approved by U.S. Department of Energy/Headquarters (DOE/HQs) and these deliberations can take months to resolve, not including the desire by the Defense Nuclear Facilities Safety Board (DNFSB) to also review and weigh in all of these matters.

*d) Can you provide a specific example where changing requirements late in a project has led to increased costs?*

The combination of the following LANL specific examples has resulted in excessive additional costs during project design, construction, and operations for engineered controls, without consideration of costs against the benefit of risk reduction. TRU Waste Facility (TWF) Fire Suppression System (FSS) and Use of Forklifts Significant debate between NNSA and Los Alamos occurred to resolve a disagreement regarding need for credited building fire suppression systems (FSS). NNSA directed that six months after startup the Transuranic Waste Facility (TWF) FSS be upgraded to Safety Significant (SS). One reason is to control battery failure-caused forklift fires in lieu of using administrative controls on combustible loading (removing the hazard; a preferred strategy), maintenance on a forklift (preventive), and a fire watch during forklift waste handling within the buildings. Electric forklifts were already planned instead of hydrocarbon-powered units to improve safety during the earlier conceptual design phase of the project. Ultimately, the Laboratory will be required by NNSA to credit the FSS for this facility, regardless of the work to remove ignition sources and combustibles from the facility. This direction will increase operational costs for marginal safety improvement and the debate added months to the schedule. TRU Waste Facility (TWF) Sealed Sources, Government Furnished Equipment (GFE), and Safety Controls In this case, additional safety controls were required for Government Furnished Equipment (GFE) of a High-Energy Neutron Counter (HENC) trailer for an operational fire hazard. The trailer will contain the GFE provided DOE EM Central Characterization Program (CCP) HENC. ANSI-certified calibration sources (designed per DOE CCP specifications) required additional controls, in this case a Safety Significant fire rated safe as a control. This is inconsistent with other sites in the DOE complex using the same equipment. This example highlights inconsistent application of DOE safety requirements. Chemical Hazards Analysis for the Hazard Category 3 Transuranic Liquid Waste (TLW) Facility A chemical hazard (Sodium Hydroxide) at TLW that is commonly used in industrial applications, such as making paper and soap, is being required to go beyond standard industry practice with respect to controls. In this case, a splash shield around piping and equipment is being driven to increased nuclear safety requirements when industry practice and DOE guides don't require it. A sodium hydroxide solution leak and spray that could burn operators is beyond unlikely since we can administratively bar them from the work area during solution transfers. This ultra-conservative direction and interpretation of DOE regulations is leading to overly conservative controls for chemical hazards in Los Alamos National Laboratory (LANL) nuclear facilities.

Mr. ROGERS. Dr. McMillan, you specifically mention reviewing several OMB and DOE rules and policies on disposing of unneeded facilities. What would you suggest be changed in these policies? What are the impacts on your organization and the enterprise from the existing policies?

Dr. McMILLAN. Los Alamos has annually worked to manage the site footprint, resulting in a reduction of nearly 1.6 million square feet of facility space over the last 10 years. We used to be able to take down facilities and "bank" the space reduction to offset needed building to prove that we are actively managing the total Laboratory square footage. We had banked a lot of space reduction credit that was erased in 2015 by new OMB rules. So now we must plan to reduce space in the same fiscal year as we build new and receive no credit for our demonstrated history of good stewardship. Clearly, this policy is cumbersome and unlikely to achieve the intended benefit. We should get the credit from previous space reduction so we can continue to provide the enterprise the agile facilities necessary to respond appropriately to changing mission demands. Proposed Action and Justification We propose that OMB modify the Management Procedures Memorandum 2015-01 to address deficiencies in the current guidance that unintentionally imposes costs associated with delayed demolition and slows the effective reduction of the Federal real property footprint at some sites. To enable more effective Footprint reduction and impose fewer impacts on new construction planning, we propose the following actions:

- Modify Memorandum 2015-01 to include language authorizing Federal sites to re-establish their previous Square Footage Bank that includes all offsets accrued through disposition since 2002 and from which square footage can be deducted when mission needs require new construction. Because the relationship between demolition and construction is often sequential, it is necessary to first demolish before new construction can be funded in the out years. Prior to the

Reduce the Footprint initiative, NNSA sites were permitted to maintain a Square Footage Bank of demolished assets from which deductions could be made when missions require additional space. This process led to highly aggressive demolition efforts to reduce the overall maintenance burden and free up funding for construction of modern and efficient facilities. In order to return to the efficiency and flexibility of this system we recommend the addition of a section authorizing sites to utilize the Square Footage Banks they have established since 2002 to “right size” the federal footprint.

- Modify Memorandum 2015–01 to specify that Office and Warehouse spaces are convertible and the demolition of one space type can provide offsets for the construction of the other space type. In order to provide maximum flexibility to the guidance that office and warehouse space be tracked and reduced, we recommend that OMB add language to enable the conversion between the two space types. Providing clarification to enable the demolition of office space to offset new construction of a warehouse and vice versa would improve flexibility in meeting changing mission requirements.
- Modify Memorandum 2015–01 to include guidance on how agencies may obtain an exemption from the requirements of this Memorandum. In the event that agencies and their sites experience growth in mission and have a legitimate need for increasing the square footage above baseline, there is no formal mechanism for obtaining an exemption. We propose that a section be added to Memorandum 2015–01 that provides guidance for how agencies and sites can obtain exceptions to the rules when mission requires or when Congress authorizes Capital construction in excess of the baseline limits.

Mr. ROGERS. Dr. McMillan, how could we go about ensuring analyses of alternatives are completed in a timely fashion and decisions are made shortly thereafter?

Dr. McMILLAN. A formal Analysis of Alternatives (AOA) should not be required for all projects. Applying requirements for AOAs and other reviews as a one size fits all approach may lead to increased costs and delays to achieve new facilities and capabilities. An AOA is too cumbersome for projects where the solution is obvious (like replacing the 40-year-old plutonium facility fire alarm panels), yet appropriate for larger projects such as plutonium facility modular additions. Also, additional scheduling delays are inevitable due to the sheer volume of projects currently requiring AOA review. The same is true for other reviews required by DOE O 413.3B, including Independent Project Reviews and Independent Cost Estimates. Small projects should have a tailored process that balances increased costs and delays against unquantifiable risk. Full compliance with DOE O 413.3b should be returned to the previous limit of projects costing more than \$50M and above, instead of the current \$10M and above. Project Management Executives (PME) should be allowed greater authority over scope definition and approvals. PMEs have the ultimate authority to make decisions and resolve conflicts. We recommend the following:

- Eliminate requirement for NNSA cost evaluation organization to concur with AOAs scope or results, since there is no benefit to this requirement.
- Clearly articulate the program requirements for the AOA at the initiation of the process.
- While the AOA process should be independent, ensure each team includes members who understand the labs, how the project fits within the mission, and is able to work with lab representatives to gather additional data.
- Ensure that the AOA team is staffed with members possessing necessary expertise.
- The AOA team should stay focused on what is the right choice for the nation, between well-defined alternatives, for various alternatives with different scopes, schedules and budgets—and the extent to which they meet the requirements.
- Ensure that the AOA team clearly understands the scope and focus of their tasking.

Mr. ROGERS. Dr. McMillan, does the condition of the infrastructure at your sites affect your ability to attract, retain, and motivate workers? Do the substandard conditions harm morale?

Dr. McMILLAN. The Laboratory works hard to attract and retain the best and brightest workforce possible; we are mindful that we are recruiting in a very challenging environment, competing against other laboratories, the tech giants in Silicon Valley and elsewhere. We typically succeed when we can demonstrate that recruits will be able to work on complex scientific and technical challenges in the service of national missions, and will have access to state-of-the-art experimental and super-computing tools.

Workers can become demotivated quickly, however, as a consequence of residing in spaces that are in poor condition, buildings with systems that break down frequently and areas where repairs are difficult or delayed.

When I testified before the Committee, I talked about the need to invest in the people who are the stewards of the stockpile who must not be overlooked when discussing infrastructure investment; in fact, the two must go hand-in-hand. The ability to attract, educate, and retain the best-and-brightest minds who will be our next generation of weapons scientists and engineers are integral to, and dependent upon, such investment. Every year we make tough calls when setting priorities for infrastructure and maintenance spending. Mission priorities rank highest, with roads, electrical infrastructure, and offices as lower priorities. As a result, we currently have some employees in “temporary” trailers that have been in use for more than 30 years, and we regularly have to manage rodent issues, leaking roofs, and other effects of aging.

Such an environment is not conducive to hiring the nation’s best-and-brightest workforce, and certainly doesn’t provide our laboratories with a competitive edge in recruitment and retention when contemporary private-sector technology companies offer attractive and inviting campuses. Investments would allow us to demolish old structures and move the workforce of the future into offices and laboratories that are appropriate for the mission. Staff morale is also impacted by the pace infrastructure upgrades can be made. Los Alamos works to efficiently address infrastructure issues. At the same time, the scale of the Laboratory and the age of our facilities make it impossible to get to everything at the pace that we would prefer.

Mr. ROGERS. Ms. Reichert, does the condition of the infrastructure at your sites affect your ability to attract, retain, and motivate workers? Do the substandard conditions harm morale?

Ms. REICHERT. Attracting and retaining the next generation of great workers becomes more challenging in facilities that are in a deteriorated state and morale is impacted by the conditions of our facilities. As I discussed during the hearing, our workers experience the infrastructure challenges every day. They remain vigilant in performing their jobs to the highest standards while often working in facilities that are less than ideal, and are the subject of frequent repairs and outages. Furthermore, many of our workers have had life long careers at the sites and for them, keeping the sites going is truly a service to the nation with a knowledge of the past difference these sites have made. But they deserve better.

Projects like the Jack Case and New Hope Centers at Y-12, the Highly Enriched Uranium Materials Facility at Y-12, and the Administrative Support Complex and the High Explosives Pressing Facility at Pantex go a long way toward addressing morale issues, but it is no doubt a challenge to recruit top talent while competing against industries that can provide better facilities with modern safety, security, and work environment amenities. The excitement at the groundbreaking for the Pantex Administrative Support Complex in August was palpable, and it is very apparent that employees are excited to work in a state-of-the-art facility that is commensurate with the importance of their jobs to national security.

Mr. ROGERS. Can you elaborate on the process used to pick a developer for the Pantex Administrative Support Complex?

Ms. REICHERT. Consolidated Nuclear Security went through a rigorous process to select a developer for the Pantex Administrative Support Complex. That process began in April 2015 after CNS received approval from the National Nuclear Security Administration to pursue a leasing arrangement. On April 13, 2015, CNS published a Sources Sought Notice on FedBizOpps ([fbo.gov](http://fbo.gov)) to seek parties interested in developing/leasing an administrative complex.

A meeting was held at Pantex on May 19, 2015, to provide information to and answer questions from companies that responded to the Sources Sought Notice. At that time, proposals were requested from interested developers. Four responsive proposals for the new Administrative Support Complex were received. CNS established a selection team and selection criteria and hosted four proposal teams for oral presentations on June 2-3, 2015. The team selected Lawler-Wood, LLC, to further develop an Administrative Support Complex leasing agreement.

Lawler-Wood’s proposal called for construction on land owned by Texas Tech University, funding through a bond offering, and partnership with a local economic development agency to establish a special purpose entity to own the facility. The approach was identical to the model that was used to develop and construct the Jack Case Center and New Hope Center at the Y-12 National Security Complex.

After CNS entered into a pre-construction agreement with Lawler-Wood, Lawler-Wood entered into an agreement with the Panhandle Economic Development Corporation (PEDC) to issue bonds to pay for the facility and to establish a special purpose entity to own the facility and repay the bonds. Following NNSA approval for the Administrative Support Complex project, Pantex Administrative Support Complex, LLC, (the PEDC special purpose entity) was established and a final lease agreement was signed by Pantex Administrative Support Complex, LLC, and CNS

establishing a five-year lease agreement with two five year renewal options. The purchase of the land from Texas Tech University was also completed at that time and Pantex Administrative Support Complex, LLC, entered into a development agreement with Lawler-Wood Pantex, LLC, to design, build, and manage the Administrative Support Complex.

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**QUESTIONS SUBMITTED BY MR. DESJARLAIS**

Mr. DESJARLAIS. Could you please provide a list of “single-point failures” within the NNSA enterprise. Facilities that, if they go down, we lose a critical capability that endangers the ability of the entire enterprise to sustain the stockpile.

General KLOTZ and Mr. MCCONNELL. Over the last several decades, NNSA has taken action to eliminate unnecessary redundancies across the NNSA enterprise. As a result, most facilities under NNSA’s purview are considered to be single points of failure. Additionally, most pieces of programmatic equipment and facility systems (such as fire suppression, heating and cooling, and dehumidification) housed in these facilities are also single points of failure.

Mr. DESJARLAIS. You stated that you are working with the NNSA on a lithium strategy to ensure we have materials in future for weapons stockpile. Could you elaborate on this strategy? Are similar strategies being developed for the other key areas of concern (uranium, high explosives at Pantex)?

Ms. REICHERT. All three of our main capabilities—uranium and lithium at the Y-12 National Security Complex and high explosives at Pantex—are essential to the National Nuclear Security Administration’s weapons program and are priorities for modernization. Lithium capabilities are housed at Y-12 in Building 9204-2, an original Manhattan Project facility built in 1943. As I testified, the facility infrastructure and process equipment is deteriorating rapidly making it costly to maintain safe and reliable operations while production is ongoing and requirements are increasing. Currently, several initiatives are under way to ensure we maintain our lithium capabilities. Planning is ongoing for a new Lithium Production Capability, but as part of a Lithium Bridging Strategy, we are also increasing useable inventory, repairing degrading infrastructure, and deploying new technologies.

Similar strategies have been developed for uranium at Y-12 and high explosives at Pantex. The Uranium Processing Facility is key to the uranium strategy. When it’s completed, it will be a first-of-its-kind complex for enriched uranium operations in support of Y-12 missions, replacing a 70-year-old facility, the 9212 complex. At the same time, other facilities that support uranium work at Y-12, Buildings 9204-2E and 9215, are undergoing Extended life Programs that will help sustain operations there in the coming decades. A three-prong approach to the facilities is being taken that includes reducing material-at-risk so the consequences of an accident are significantly reduced, replacing or refurbishing key facility infrastructure and process equipment, and addressing and updating regulatory requirements.

At the Pantex Plant, we’ve also been moving to modernize our high explosives infrastructure. In February, we completed construction on the 45,000-square-foot High Explosive Pressing Facility, which will provide a new high explosive main-charge pressing facility that can meet the needs of changing weapons complexity, projected workload, and Life Extension Program activities. The facility consolidates high explosive main-charge pressing operations from six outdated buildings into a single, state-of-the-art facility while providing increased levels of protection for workers. Planning is also under way for a new High Explosive Science and Engineering facility that will consolidate science and engineering offices and high explosive laboratories into two new buildings, including a 27,420-square-foot High Explosives Laboratory, a 38,487-square-foot Technology Development & Deployment Laboratory and a high explosive staging area.