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Chairman Nelson, Ranking Member Sessions, and Members of the Committee, thank you for the opportunity to appear before you today.

I am Dr. Charles McMillan, Director of Los Alamos National Laboratory (LANL). My 29-year commitment to America's nuclear weapons program encompasses over two decades of service at Lawrence Livermore National Laboratory (LLNL) and six years at Los Alamos. Following the moratorium on nuclear testing, I participated in the discussions that helped establish Stockpile Stewardship.

Since I assumed leadership at Los Alamos almost a year ago, it has become clear that our nation faces a difficult budget situation, and hard choices must be made. I am proud of the way that the men and women of Los Alamos have played their role in helping to meet these challenges with professionalism and innovation. Through difficult times, they are maintaining a focus that is delivering on the Laboratory's mission. I look forward to working with you as we continue delivering national security science in both the present and the future by making challenging investment decisions-- while keeping faith with a workforce that has demonstrated career-long dedication to the service of our nation.

I continue to believe that the direction laid out in the Nuclear Posture Review and the 1251 Report provides an appropriate and technically sound course. These documents outline a consistent plan that, if implemented, would do the work necessary to support the nation's stockpile through modernization of our nuclear infrastructure and a warhead life extension program (LEP).

Now, because of changes in budget and policy priorities, I am concerned that we do not yet have a clear path forward for meeting all of our commitments to the stockpile.

NNSA governance will play a key role in determining both our efficiency and effectiveness as we address looming mission and budget challenges. In my view, a strong partnership between NNSA and the laboratories, building on the full opportunities afforded by our status as Federally Funded Research and Development Centers (FFRDC), can serve to reestablish the trust that has been a source of solutions in previous challenges.

Governance

The National Academy of Sciences (NAS) report on oversight of the NNSA labs is the latest in a series of reports that has highlighted governance issues for the laboratories: governance that is characterized by a lack of trust, burdensome oversight, and structural flaws. The issues they identified in their report ring true in my experience at the Laboratory.

> "An **erosion of trust** on both sides of the relationship shapes the oversight and operation of the laboratories. This in turn has resulted in **an excessive reliance on operational formality** in important aspects of Laboratory operations, including the conduct of science and engineering…" (NAS report, page 23, emphasis added)

In my view, we have become so focused on operational formality that we risk losing sight of the reasons why the Government-Owned, Contractor-Operated (GOCO) business arrangements were created in the first place. Our common objective is to safely maintain the stockpile using best business practices; operational formality is a means to that end. As the NAS report states, this formality can be a mismatch when applied to creative activities such as science and engineering (report, page 24).

I agree with the report's statements on oversight:

> "…the NNSA, Congress, and top management of the Laboratories recognize that safety and security systems at the Laboratories have been strengthened to the point where they no longer need special attention. **NNSA and Laboratory management should explore ways by which the administrative, safety, and security costs can be reduced, so that they not impose an excessive burden on essential S&E activities**." (NAS recommendation 5-1, page 31, emphasis added)

While NNSA had an auspicious beginning, the promise of semi-autonomy has not yet been fulfilled. Duplication and overlap remain between DOE and NNSA regulations and guidance. As an example, the DOE Office of Health, Safety, and Security (HSS) still plays a significant role in NNSA-- despite NNSA having its own regulations and guidance.

Structural issues continue to be a challenge for NNSA:

> "The 2001 Foster Panel report reiterated the points it made in its previous report, emphasizing that the Secretary of Energy must remove the unnecessary duplication of staff in such areas as security, environmental oversight, safety, and resource management." (NAS report, page 51)

The weapons laboratories are FFRDCs that serve as trusted, independent advisers to the government on complex technical issues-- foremost among these being nuclear weapons. For much of the last decade, I have seen a trend within NNSA toward treating the laboratories more like traditional contractors rather than fully employing the capabilities they offer the government through the special FFRDC relationship (FAR 35.017).

A maturing model between the labs and NNSA would include the ability to work within a framework to accomplish goals established by policies set by Congress and the Administration. Changing the type of oversight from transactional to strategic can lead to a smaller bureaucracy, and thus reduce the size of the infrastructure needed to respond to that bureaucracy.

In the last few months, the NNSA leadership has begun to reengage the lab directors in substantive dialogue on program priorities. This is a first step toward reestablishing the type of trust that was necessary to create the stewardship program. Many steps remain if we are to meet the challenge of the next decade: modernizing the stockpile at a pace that exceeds our past experience.

There are examples of increasing burden and in other cases where there is a glimmer of hope. I mention two of the latter.

- The Office of Defense Nuclear Security (DNS) has worked to balance the need for robust security with the reality of shrinking federal security budgets. The DNS engages individual sites to understand programmatic needs and then develops a solid approach that allows work to be accomplished within a well-defined risk envelope.

- In recent months, we have worked with our colleagues at the Los Alamos Site Office to develop a risk-based framework for evaluating computer system security and streamlining documentation required to operate these systems. This framework may reduce a bookshelf of documentation to a single binder.

While these examples illustrate positive steps to reduce administrative costs, they remain the exception in a system that has become moribund over many years. Studies such as those cited above have examined structural options for NNSA; all have merit, none are perfect. Whichever path we adopt for the future governance of the laboratories, it is essential that all relevant branches of government are aligned to ensure its success.

Nuclear Infrastructure

The existing Chemistry and Metallurgy Research (CMR) facility at Los Alamos is 60 years old, sits on a seismic fault, and, as the Congressional Commission on the Strategic Posture of the United States said in 2009, “is already well past the end of its planned life.” The facility is unable to meet the high-volume analysis needed to meet the Department of Defense (DoD) expectation of 50 to 80 newly manufactured pits per year. Three wings of CMR's six have been closed because of their location over the fault and to reduce risk. At the direction of NNSA, we are preparing to retire the facility in 2019.

The decision to defer construction of the Chemistry and Metallurgy Research Replacement-Nuclear Facility (CMRR-NF) leaves the United States with no known capability to make 50 to 80 newly-produced pits on the timescales planned for stockpile modernization. This will affect our path forward on the W78 LEP.

Let me be very clear: CMRR-NF is not a manufacturing facility for pits. It fulfills a critical mission in supporting the analytical chemistry and metallurgy needed to certify that the plutonium used in the stockpile meets basic material requirements. The ability at CMRR-NF to quickly analyze and characterize special nuclear materials—to know where they were made, their purity, and their chemical and mechanical properties—also underpins our work for the nation in non-proliferation, counter-terrorism, and treaty verification missions. Pit production occurs and will continue in Building PF-4 at Los Alamos. CMRR-NF was designed to provide needed capacity for materials characterization, waste staging and shipment, non-destructive assay, and vault storage. In the absence of CMRR-NF, the limited floor space in PF-4 must be used to address these functions, albeit at reduced levels.

At the direction of NNSA, we are in the process of completing a 60-day analysis of existing plutonium capabilities within the Radiation Laboratory Utility Office Building (RLUOB) at Los Alamos, Superblock at Livermore, and other sites. Because of our limited plutonium infrastructure, investments that are not in the current plan will be required to produce even 20 to 30 pits per year using all of these facilities. In this study, LANL is examining accelerating the removal of material from the vault in PF-4, expanding the capability of RLUOB, and constructing a system to transport materials between PF-4 and RLUOB. The not-yet-budgeted costs associated with these changes are expected to extend over five to eight years.

Pit Reuse

Pit reuse has been suggested as a way to bridge the shortfall in newly-produced pits caused by delaying CMRR-NF construction. The nation has pits that are not needed in current systems. These are candidates for use in a modernized stockpile. While I am cautiously optimistic that some of these pits can be reused, two important issues must be addressed before certification for stockpile use:

- First, continued progress in understanding the effects of pit aging.
- Second, the system modifications necessary to ensure that pits designed for use with conventional explosives can be reused in modern, insensitive high explosive systems.

Both are challenging scientific problems.

In 2006, the JASON issued a report on plutonium aging based on studies conducted by LANL and LLNL. In a letter responding to this report to then-chairman John Warner of the Senate Armed Services Committee, NNSA said that it “is imperative that we continue to assess plutonium aging through vigilant surveillance and scientific evaluation, since the plutonium-aging database only extends to approximately 48 years for naturally aged material and 60 years for the accelerated aged material. The primary performance database from underground testing is even more limited.” Unfortunately, since this letter was written, work in this area has been constrained by funding; much work remains to be done.

The pits that are available for reuse were not designed to provide the safety of a modernized stockpile using insensitive high explosives. While we have concepts for using these pits in a modernized stockpile, the extensive work required to convert these concepts to systems that could be certified is yet to be done.

Consider the following analogy: using old pits in a modernized stockpile would be like taking an engine from a 1965 Mustang and installing it in a 2012 model while continuing to meet 2012 emission requirements. It might be possible, but not without a lot of work, not to mention impacts to the other parts under the hood. Furthermore, certifying that it would work without ever driving the car would be challenging.

Life Extension Programs

As our systems age, LEPs have become necessary to continue confidence in the safety, security, and reliability of the stockpile. It is in LEPs that we see a return on investments made in long term science.

I am pleased to report that Los Alamos Life Extension activities on the W76-1 continue smoothly at the plants with Los Alamos providing technical support as needed. We will continue our engagement to monitor product quality and ensure that design intent is maintained.

As you are aware, the Nuclear Weapons Council (NWC) authorized Phase 6.3 for the B61 LEP with a first production unit (FPU) in 2019. At Los Alamos, we are on a path to meet this deliverable because of investments that have been made over many years in the science and engineering campaigns. Tools such as the Dual Axis Radiographic Hydro-Test (DARHT) Facility , high performance computing and the Advanced Simulation and Computing (ASC) Program codes that we use to predict weapons performance are being applied today to the B61 LEP. We have used the investments in these campaigns to develop the technologies for gas transfer systems (GTS) so that we can quickly and cost-effectively implement specific designs for the B61. Given stable, predictable funding at levels consistent with the 6.2A study, I am confident that LANL will deliver on its responsibility for the B61.

Long Term Science

Science is the base that allows LANL to address challenging issues that face the stockpile. At LANL we have a scientific workforce that includes approximately 2,500 PhDs. They form the core of our scientific base. The weapons program directly benefits when these scientists work on challenging technical problems using tools such as DARHT, the Los Alamos Neutron Science Center (LANSCE), and the ASC Program. Our ability to do stockpile work today is the product of these investments. Our science and engineering campaigns produced mature technology that was ready when needed. Similar investments are needed today to ensure that the Laboratory has tools and technologies to be ready for tomorrow's challenges.

In addition to benefiting the Lab's weapons program, we are able to leverage these capabilities for broader national interests. They, in turn, feed valuable technical insights directly back into the nuclear weapons program, including Life Extension Programs. Our work in nuclear forensics and medical isotope production illustrates these points.

- Nuclear forensics and attribution: Los Alamos delivered a suite of models and databases for National Technical Nuclear Forensics applications, such as modeling debris

signatures and other nuclear security applications. LANL's capabilities in this area are a direct outgrowth of the former nuclear weapons testing program where scientists had to study the detailed chemistry of soil samples to determine various characteristics of detonation. Our experts in this area not only help with the current nuclear forensics, they also support the weapons program by helping to reinterpret data from previous underground tests. This information is then used to validate our weapons codes.

- Thanks to the Isotope Production Facility at LANSCE, LANL is a national leader in producing strontium-82 for cardiac imaging and germanium-68 for calibrating proton emission tomography (PET) scanners. Other isotopes, such as aluminum-26 and silicon-32, are unique to Los Alamos and are not produced anywhere else in the world. With the demand for short-half-lived medical isotopes being one of the fastest-growing needs of health care providers, the industry and medical researchers are looking to Los Alamos to provide a stable supply of these isotopes. Providing these isotopes as a service to the nation maintains the skills at Los Alamos for producing and handling exotic isotopes.

Despite difficult and uncertain budgetary scenarios, a careful balance between LEPs and science, technology, and engineering must be maintained.

Looking Ahead

Just as training and equipping prepare our armed forces to fight in battle, the science done at the national laboratories prepares our employees with the knowledge and tools needed to sustain the stockpile. While the balance must shift as we apply our knowledge and tools to LEPs, we cannot abandon preparation for the future any more than the military can abandon training and equipping, even in the midst of fighting a war.

In general, the budget for Directed Stockpile Work Services has seen successive cuts that have hampered progress toward goals set in the Nuclear Posture Review (NPR), especially in the Component Maturation Framework, more sustainable hydrotest capability, nuclear safety research and development, and Plutonium Sustainment.

Over the last few months, I have been asked to estimate the budget impacts of pit reuse as a way to bridge our manufacturing gap. We are still in the early phases of work that would allow pits designed for conventional-high-explosive systems to be used in systems using insensitive explosives. Should the nation choose to pursue this path, we believe that approximately $50 million per year will be needed for the next five to ten years beyond already-planned investments before we could certify systems using these pits. Because this work must start now if this concept is to be viable for coming LEPs, we are planning experiments this summer to gain insight into system behavior. While we believe this a promising direction for innovation to meet a national challenge, we cannot confidently predict the outcome. There is risk.

Whether the ultimate decision is to move forward with an alternative plutonium approach, or to continue with CMRR construction, every day that we do not address the issue is a day in which our risks increase. At a minimum, we need access to the $120 million appropriated in FY12 that

will remain after placing CMRR-NF in a stable state to make investments supporting a path forward. Furthermore, the $35 million already in the budget request for FY13 will be needed to accelerate PF-4 vault clean-out. Access to these funds will allow us to continue making wise investments in our plutonium capability. This includes studying a transportation system between PF-4 and RLUOB, expanded use of RLUOB, and a migration of processes from CMR to PF-4. If we are to support the LEPs necessary over the next decade, we cannot afford to postpone action to address the nation's plutonium capability.

Funding Issues

When looking at funding, we must address the issues we see today as well as the investments needed to meet challenges in an uncertain future. Today, the stockpile requires action-- action to address changes that we see occurring in the stockpile on timescales that are dictated by nature. Chemistry and physics take an unrelenting toll on the aging stockpile. As we work to modernize the stockpile, the balance is shifting toward today's issues as it must. However, I am concerned that short term stockpile needs may be shifting the balance too far to the present-- putting our ability to care for the stockpile in the future at risk.

I must speak about the difficult budget issues facing LANL this fiscal year. While planning in FY11 for the increases outlined in the 1251 report, LANL was prudent in hiring. Nevertheless, as FY12 began it seemed unlikely that we would see the full planned increase. In November of 2011, I established the Laboratory Integrated Stewardship Council (LISC) to ensure that we manage our resources in a consistent, conservative manner across the Laboratory. This council is chartered with making financial decisions to keep Laboratory spending in line with a highly constrained budget.

For FY12, LANL funding across our national security accounts is some $300 million lower than it was in FY11. In the FY13 budget request, funding at LANL appears to be down another $100 million.

These cuts made it necessary for me to make the difficult decision to move forward with a voluntary separation program to reduce our workforce. Just over a week ago more than 550 employees left the Lab. Many had decades of experience in the Weapons Program. Despite succession planning, we are losing valued employees sooner than expected.

Pension Relief

In 2006. Los Alamos made major changes in its pension system. New employees are no longer able to enroll in a defined benefits pension system. Rather, they are part of a defined contribution plan. While this system no longer provides the incentive to remain at the Laboratory until retirement, it also relieves LANL of the long-term liabilities associated with a defined benefits program.

The Laboratory remains committed to the benefits promised to employees who have, for many years, been participants in the defined benefits program—a program that has been closed since 2006. However, historically low interest rates coupled with the actuarial rules of the Pension

Protection Act (PPA) have caused estimates of future liabilities to balloon. As a result, the Laboratory has been making contributions to the pension plan out of program funds for the last few years at well above the $100 million level. While we have increased employee contributions, they are only a partial offset to the contributions required by the PPA. If interest rates return to levels that have been typical over the last 25 years, it will not be long before our plan appears to be over-funded.

Mr. Chairman, I urge the Congress to pass the proposed changes to the Pension Protection Act (PPA) that include a permanent "funding stabilization" provision. Today's unusually low interest rates, combined with existing pension funding legislation, have artificially increased our pension liabilities in the short term. This has reduced and will continue to reduce the funding available for the mission by tens of millions of dollars per year at a time when mission needs are growing and budgets are severely constrained.

In summary, I believe the proposed "funding stabilization" relief would provide a substantial amount of funding back to weapons program activities without incurring undue risk in pension funding over the long term.

Closing

The fundamental premise of Stockpile Stewardship is that a healthy program can sustain a workforce able to make technically sound decisions supporting the stockpile, using the scientific tools they have developed. Today we are well-positioned to make these decisions because of the investments the country has made over the last two decades. However, I'm increasingly concerned that we may no longer be on a healthy path. As our budgets at LANL are reduced, our risks increase. Some risks may be acceptable, but I am sure that there will be a point at which those risks become unacceptable.

Thank you, Mr. Chairman, for the opportunity to testify today.