

**Statement of Dr. Thomas O. Hunter
President and Director
Sandia National Laboratories
United States House of Representatives
Committee on Armed Services
Subcommittee on Strategic Forces
July 17, 2008**

Introduction

Madam Chairman and distinguished members of the Committee, thank you for the opportunity to testify. I am Tom Hunter, President and Director of Sandia National Laboratories. Sandia is a multiprogram national security laboratory owned by the United States Government and operated by Sandia Corporation for the National Nuclear Security Administration (NNSA).

My statement responds to the Committee's request to discuss three closely related issues: (1) the national security rationale for the Stockpile Stewardship Program and the complex that supports it; (2) the Preferred Alternative for Complex Transformation that NNSA has proposed; and (3) other alternatives for securing the continued effective execution of the Stockpile Stewardship Program.

The National Security Rationale for the Stockpile Stewardship Program

Clearly, a vigorous national policy discussion concerning the future role of nuclear weapons is occurring today. This is a necessary and important discussion, and it demonstrates the vitality of our form of government. NNSA's job—and the job of its laboratory directors— will be to implement the nuclear weapon mission as determined by the nation's policy makers. The nuclear weapon stockpile will no doubt be different as we move forward. Its composition and size will likely be altered, and it will be increasingly older.

Regardless of how policy may change, the fact that nuclear weapons and a nuclear weapon knowledge base exists in the modern world creates important challenges that must be managed over the long term. The NNSA complex will continue to have principal mission responsibility for meeting those challenges.

Nuclear weapons continue as a key element of U.S. national defense policy. Consistent with existing policy, the NNSA laboratories are implementing the Stockpile Stewardship Program, which is the essential mechanism for maintaining the nuclear weapons stockpile. It is a challenging mission.

The NNSA laboratories serve several key purposes through the Stockpile Stewardship Program:

- First and foremost, the laboratories support the weapons currently in stockpile. We do this through stockpile evaluation and assurance activities, which permit the laboratories to inform the Secretaries of Energy and Defense about the safety, reliability, performance and military effectiveness of the stockpile every year. The law requires that this assessment be submitted to the President and the Congress without change.

- Issues inevitably arise as a consequence of aging or other factors. The laboratories resolve these issues when they occur, and upgrade aging subsystems as legacy technology becomes obsolete.
- The weapons science competencies that reside in the laboratories position the nation to evaluate and respond to unanticipated developments in the international environment or in the weapons technology of other nations. It is important that laboratories retain the capability to perform a warhead system development, if warranted by a future change in policy.
- The laboratories continually evaluate weapon surety systems and provide enhancements as necessary. Safety and security of warheads must be vigilantly maintained. Thus we constantly push the state of technology to reduce risk as far as practical.
- The laboratories maintain a deep foundation of scientific and engineering competencies, which is an essential component of our nation's deterrent—as well as a resource for national leadership in technology to address broad national security challenges.

The Stockpile Stewardship Program must continue to be structured in such a way that the laboratories can provide the flexibility that will be required to respond to changes in nuclear weapon policy. If Stockpile Stewardship focuses exclusively on the legacy stockpile of the Cold War, it may not have the flexibility to adapt efficiently to new policy requirements. Moreover, indefinitely maintaining legacy weapons may require a more costly nuclear weapons complex over the long term. We need to maintain a balance of investment in scientific and technical competencies for design and assessment with those needed for the production complex.

Leadership in science and engineering is important for ensuring an effective stockpile. The laboratories must attract and retain high-quality staff and maintain key scientific facilities. System engineering programs, technology development, and advanced scientific and engineering research are important for sustaining the quality of our technical talent.

The Committee should be aware that reductions proposed in the House markup for appropriations in Weapons Activities would have a significant impact on the NNSA laboratories' ability to perform their responsibilities in Directed Stockpile Work and the science, engineering, and computing campaigns that support stockpile assurance. Similarly, Laboratory-Directed Research and Development is marked for a reduction by half, which would impact the laboratories' capability for scientific and engineering innovation that benefits all of our national security missions.

In my opinion, an essential characteristic of the Cold War's resolution and a fundamental element of deterrence going forward is the strength and resiliency of the NNSA laboratories. Their scientific capabilities have deterred our adversaries, contributed mightily to the nation's technological leadership, and seen many significant applications in support of national security. It is essential to recognize the ongoing need for a vital scientific foundation to support the evolving national security policy.

The Preferred Alternative For Complex Transformation

In January, NNSA released its draft Supplemental Programmatic Environmental Impact Statement (SPEIS) for transforming the nuclear weapons complex. Complex Transformation is a vision for a smaller, safer, more secure, and less expensive complex. The SPEIS outlines a

Preferred Alternative utilizing distributed centers of excellence, and it proposes to consolidate some missions and facilities within the existing NNSA sites.

We at Sandia recognize the need for changes in the nuclear weapons complex. We support NNSA in its effort to transform the complex into a modern enterprise for efficient and cost-effective stewardship of the nuclear deterrent.

We have long supported and see great benefit in the Preferred Alternative's proposal to consolidate Category I and II special nuclear materials (SNM). We are so committed to that concept, and to the improvements in security posture and the complex-wide cost savings associated with it, that in February we completed the removal of all discrete Category I and II SNM from Sandia sites.

Implementation of the Preferred Alternative must be carefully managed so that essential capabilities remain strong and can continue to support the core products for which we are responsible. Sandia's core products for the Stockpile Stewardship Program include engineered and integrated warhead systems; arming, fuzing, and firing systems; neutron generators; gas transfer systems; and surety systems.

The capabilities that we regard as essential for enabling our core products include major environmental testing, radiation effects science, computational simulation, microsystem technologies, materials science, and the engineering sciences. Many of these capabilities are synergistic with those in industry and at research universities; however, they do not exist in those sectors in the specialized forms required for stockpile stewardship nor as an integrated enterprise. These capabilities are also important to the nation's broader science and technology agenda.

Under the Preferred Alternative, Sandia would continue to be the center of excellence for science and engineering for warhead non-nuclear systems and components and for major non-nuclear environmental testing. Sandia would also develop a revised flight testing strategy for gravity weapons at the Tonopah Test Range and would have a different role in NNSA's high-performance computing program. Sandia's California laboratory would continue to perform the non-nuclear systems engineering for nuclear weapons designed with the Lawrence Livermore National Laboratory, and it would also transition to a multi-agency resource. We are developing a plan to guide the transition of our California site to that vision.

High-Performance Computing under the Preferred Alternative

Under the Preferred Alternative for Complex Transformation, NNSA plans to consolidate operation of high-performance computing platforms at the Lawrence Livermore and Los Alamos sites. It is important to recognize that state-of-the-art capability computing is an essential foundation of all three laboratories. In fact, it was these laboratories, especially Sandia, that brought the nation to a leadership position in supercomputing—leadership in effective systems architectures, algorithms, and applications. High-performance computing is at the heart of the capability for all laboratory missions.

In order to remain a key participant in NNSA's high-performance computing program, Sandia negotiated a memorandum of understanding with Los Alamos National Laboratory that will bring together the two laboratories' computer science and operational capabilities for high-performance computing. Under this agreement, Sandia will lead in providing the architecture and engineering expertise for capability platforms, and Los Alamos will lead in deployment and operations. Teams will be formed from both laboratories to provide an unparalleled computa-

tional resource for future NNSA capability platforms.

This partnership is not without risk to both institutions. It is too soon to tell whether it will maintain the expertise that has provided the foundation for the nation's preeminent global position in computing. It will be essential for NNSA to execute a strategy that supports the Sandia/Los Alamos partnership with a platform procurement in fiscal year 2010 that meets the established requirements for maintaining and refurbishing the nuclear weapon stockpile.

In this regard, high-performance computing at NNSA is also challenged by a proposed reduction of \$66 million in the Advanced Simulation and Computing Campaign in the House markup of the Energy and Water Appropriations bill for fiscal year 2009. A reduction of that magnitude will call into question the viability of the Sandia/Los Alamos partnership.

Sandia's California Laboratory Site under the Preferred Alternative

Consistent with the Preferred Alternative for Complex Transformation, we are implementing an initiative at Sandia's California site in Livermore that is designed to sustain the core expertise for California-designed nuclear weapons while also applying those scientific and engineering assets to other national security, homeland security, energy security, and environmental challenges.

This transformation will exploit the utility of the California location, recognizing the role of the State of California in the nation's future energy, environmental, and national security needs. It also will take advantage of the other Department of Energy multiprogram laboratories in California (Lawrence Berkeley National Laboratory and Lawrence Livermore National Laboratory) and will serve as a pilot Energy Innovation Hub seeking to develop mechanisms for translating DOE-generated science into real-world applications. This approach creates an opportunity to work jointly with Lawrence Livermore National Laboratory to establish an open corridor accessible to industry and academia so that the expertise of both laboratories can be applied to unclassified issues of national importance.

This transformation pilot for Sandia's California laboratory may require a new management model within the Department of Energy that supports the mission activities of multiple program offices at a single site. The Department of Energy is working with us to define a model that recognizes the Department's overarching responsibility for a variety of national security missions while sharing institutional stewardship costs and governance responsibilities with other offices and agencies.

Alternatives for Effective Execution of the Stockpile Stewardship Program

NNSA's Preferred Alternative is a workable and prudent approach for realizing efficiencies in the nuclear weapons complex. It represents a rational way to deal with the nuclear weapon stockpile and the complex that supports it. There is, though, another factor that I think should be addressed, which applies to all future complex alternatives. That factor is the way in which the complex is managed.

As I mentioned earlier, the vitality of the NNSA laboratories is an essential element in assuring a safe, secure nuclear deterrent. These laboratories must assure that a strong science and engineering capability exists to properly respond to evolving national policy and maintain an aging legacy stockpile. Yet there is, in my judgment, an equally important element which addresses the role and character of these institutions. The laboratories must—above all—be

committed to the nation's service. The singular responsibility to objectively evaluate and inform the nation's leaders about the state of health of our nuclear deterrent is just cause to rise above all other interests and incentives for these institutions. The leadership of these laboratories must always subordinate any personal, corporate, or financial-return concerns to serve first in the national interest. This must also be the prevailing ethos for all employees in the laboratories.

This essential value system in the laboratories has been long in development, yet it is increasingly fragile as it confronts the future. It is a commodity that cannot be bought at any price, but losing it could result in a cost that we would ultimately regret.

These institutions need to feel accountable for their important national roles and for superior performance in delivering results. The entirety of each institution must be managed in a way to be continually more effective, ever stronger in scientific and engineering capability, and increasingly cost-efficient. As the complex transforms, it is imperative that accountability—with the commensurate authority for action—be maintained in our laboratories and their leaders. Potential confusion around roles and responsibilities that move beyond “what” and more toward “how” could also serve to erode the character of national service at the laboratories. As we move forward in this necessary transformation of the complex, it is my earnest hope that this important—perhaps most important—element not be overlooked.

Another important concept to help guide the transformation of the complex is to encourage synergistic multiprogram, multi-agency activities under the integrated management of each laboratory. Today's national security challenges are more complex than they were during the Cold War. Challenges in cyber security, homeland security, energy security, and other emerging threats are formidable, and the agencies addressing those challenges need access to the multidisciplinary scientific and engineering resources that exists at NNSA laboratories.

The NNSA laboratories are uniquely positioned to contribute to the solutions of today's complex national security challenges. Moreover, the laboratories will increasingly depend on diverse national security programs to enhance their critical capabilities. It makes sense, therefore, for Complex Transformation to facilitate more intensive use of the NNSA laboratories by multiple sponsors. Sandia's California laboratory is a perfect setting for testing the viability of a multi-agency model for NNSA institutions as the nuclear weapons program approaches a reduced level of effort.

Conclusion

Nuclear weapons remain a key element of U.S. national defense policy. The Stockpile Stewardship Program must continue to be structured in such a way that the NNSA laboratories can exercise the flexibility that will be required to respond to changes in nuclear weapon policy.

I support NNSA's plan for changes in the nuclear weapon complex. Implementation of the Preferred Alternative must be carefully managed so that essential capabilities remain strong and the laboratories can continue to support the core products for which they are responsible. I do have concerns about the implementation of Complex Transformation with respect to Sandia's interests in high-performance computing and our California laboratory. I am also concerned that proposed reductions in appropriations affecting the Stockpile Stewardship Program will impact our ability to perform the mission. However, if these concerns can be addressed, then I see no reason why the Preferred Alternative for Complex Transformation cannot succeed.