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Testimony

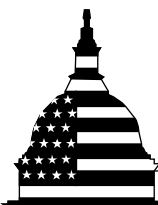
Before the Subcommittee on Strategic
Forces, Committee on Armed Services,
House of Representatives

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**NATIONAL NUCLEAR
SECURITY
ADMINISTRATION**

**Observations on NNSA's
Management and Oversight
of the Nuclear Security
Enterprise**

Statement of Gene Aloise, Director
Natural Resources and Environment



G A O

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Highlights of [GAO-12-473T](#), a testimony before the Subcommittee on Strategic Forces, Committee on Armed Services, House of Representatives

Why GAO Did This Study

The National Nuclear Security Administration (NNSA), a separately organized agency within the Department of Energy (DOE), is responsible for managing its contractors' nuclear weapon- and nonproliferation-related national security activities in laboratories and other facilities, collectively known as the nuclear security enterprise. GAO designated DOE's management of its contracts as an area at high risk of fraud, waste, and abuse. Progress has been made, but GAO continues to identify problems across the nuclear security enterprise, from projects' cost and schedule overruns to inadequate oversight of safety and security at NNSA's sites. Laboratory and other officials have raised concerns that federal oversight of the laboratories' activities has been excessive. With NNSA proposing to spend tens of billions of dollars to modernize the nuclear security enterprise, it is important to ensure scarce resources are spent in an effective and efficient manner.

This testimony addresses (1) NNSA's ability to produce budget and cost data necessary to make informed management decisions, (2) improving NNSA's project and contract management, and (3) DOE's and NNSA's safety and security oversight. It is based on prior GAO reports issued from August 2000 to January 2012.

DOE and NNSA continue to act on the numerous recommendations GAO has made in improving budget and cost data, project and contract management, and safety and security oversight. GAO will continue to monitor DOE's and NNSA's implementation of these recommendations.

View [GAO-12-473T](#). For more information, contact Gene Aloise at (202) 512-3841 or aloisee@gao.gov.

February 16, 2012

NATIONAL NUCLEAR SECURITY ADMINISTRATION

Observations on NNSA's Management and Oversight of the Nuclear Security Enterprise

What GAO Found

NNSA has successfully ensured that the nuclear weapons stockpile remains safe and reliable in the absence of underground nuclear testing, accomplishing this complicated task by using state-of-the-art facilities as well as the skills of top scientists. Nevertheless, NNSA does not have reliable enterprise-wide management information on program budgets and costs, which potentially increases risk to NNSA's programs. For example, in June 2010, GAO reported that NNSA could not identify the total costs to operate and maintain essential weapons activities facilities and infrastructure. In addition, in February 2011, GAO reported that NNSA lacks complete data on, among other things, the condition and value of its existing infrastructure, cost estimates and completion dates for planned capital improvement projects, and critical human capital skills in its contractor workforce that are needed for its programs. As a result, NNSA does not have a sound basis for making decisions on how to most effectively manage its portfolio of projects and other programs and lacks information that could help justify future budget requests or target cost savings opportunities. NNSA recognizes that its ability to make informed decisions is hampered and is taking steps to improve its budget and cost data.

For more than a decade and in numerous reports, GAO found that NNSA has continued to experience significant cost and schedule overruns on its major projects. For example, in 2000 and 2009, respectively, GAO reported that NNSA's efforts to extend the operational lives of nuclear weapons in the stockpile have experienced cost increases and schedule delays, such as a \$300 million cost increase and 2-year delay in the refurbishment of one warhead and a nearly \$70 million increase and 1-year delay in the refurbishment of another warhead. NNSA's construction projects have also experienced cost overruns. For example, GAO reported that the cost to construct a modern Uranium Processing Facility at NNSA's Y-12 National Security Complex experienced a nearly seven-fold cost increase from between \$600 million and \$1.1 billion in 2004 to between \$4.2 billion and \$6.5 billion in 2011. Given NNSA's record of weak management of major projects, GAO believes careful federal oversight of NNSA's modernization of the nuclear security enterprise will be critical to ensure that resources are spent in as an effective and efficient manner as possible.

NNSA's oversight of safety and security in the nuclear security enterprise has also been questioned. As work carried out at NNSA's sites involves dangerous nuclear materials such as plutonium and highly enriched uranium, stringent safety procedures and security requirements must be observed. GAO reported in 2008 on numerous safety and security problems across NNSA's sites, contributing, among other things, to the temporary shutdown of facilities at both Los Alamos and Lawrence Livermore National Laboratories in 2004 and 2005, respectively. Ineffective NNSA oversight of its contractors' activities contributed to many of these incidents as well as relatively lax laboratory attitudes toward safety procedures. In many cases, NNSA has made improvements to resolve these safety and security concerns, but better oversight is needed to ensure that improvements are fully implemented and sustained. GAO agrees that excessive oversight and micromanagement of contractors' activities are not an efficient use of scarce federal resources, but that NNSA's problems are not caused by excessive oversight but instead result from ineffective departmental oversight.

Chairman Turner, Ranking Member Sanchez, and Members of the Subcommittee:

Thank you for the opportunity to discuss our work on the governance, oversight, and management of the nation's nuclear security enterprise. As you know, the National Nuclear Security Administration (NNSA), a separately organized agency within the Department of Energy (DOE), is responsible for managing its contractors' nuclear weapon- and nonproliferation-related national security activities in research and development laboratories, production plants, and other facilities known collectively as the nuclear security enterprise.¹ With the moratorium on underground nuclear testing that began in 1992 and the subsequent creation of the Stockpile Stewardship Program, the mission of the nuclear security enterprise changed from designing, building, and testing successive generations of weapons to extending the life of the existing nuclear weapons stockpile through scientific study, computer simulation, and refurbishment.

Ensuring that the nuclear weapons stockpile remains safe and reliable in the absence of underground nuclear testing is extraordinarily complicated and requires state-of-the-art experimental and computing facilities as well as the skills of top scientists in the field. To its credit, NNSA consistently accomplishes this task, as evidenced by the successful assessment of the safety, reliability, and performance of each weapon type in the nuclear stockpile since such assessments were first conducted in 1995. NNSA's three nuclear weapon design laboratories are heavily involved in this assessment process and, over the past decade, the United States has invested billions of dollars in sustaining the Cold War-era stockpile and upgrading the laboratories.

Nevertheless, DOE's and NNSA's management of the nuclear security enterprise has been the subject of much criticism. The department's problems are long-standing. For example, we have designated DOE's management of its contracts as an area at high risk of fraud, waste,

¹ Specifically, NNSA manages three national nuclear weapon design laboratories—Lawrence Livermore National Laboratory in California, Los Alamos National Laboratory in New Mexico, and Sandia National Laboratories in New Mexico and California. It also manages four nuclear weapons production plants—the Pantex Plant in Texas, the Y-12 National Security Complex in Tennessee, the Kansas City Plant in Missouri, and the Tritium Extraction Facility at DOE's Savannah River Site in South Carolina. NNSA also manages the Nevada National Security Site, formerly known as the Nevada Test Site.

abuse, and mismanagement because of the department's record of inadequate management and oversight of its contractors. In January 1995, we reported that DOE's laboratories did not have clearly defined missions that focus their considerable resources on accomplishing the department's changing objectives and national priorities.² Noting that the laboratories have made vital contributions to the nation's defense and civilian science and technology efforts, we reported that DOE had not coordinated these laboratories' efforts to solve national problems but had instead managed each laboratory on a program-by-program basis. The establishment of NNSA as a semi-autonomous agency within DOE in 2000 was intended to correct these long-standing and widely recognized DOE management problems, which had been underscored by significant cost overruns on major projects and security problems at the national laboratories.³

NNSA's creation, however, has not yet had the desired effect of fully resolving these management problems. Progress has been made, but NNSA and DOE's Office of Environmental Management remain on our high-risk list.⁴ Furthermore, we continue to identify problems across the nuclear security enterprise, ranging from significant cost and schedule overruns on major projects to ineffective federal oversight of safety and security at NNSA's sites. Concerns have also been raised by national laboratory and other officials that DOE's and NNSA's oversight of the laboratories' activities has been excessive and that the safety and security requirements the laboratories' are subject to are overly prescriptive and burdensome, which has resulted in a negative effect on the quality of science performed at these laboratories.

My testimony today discusses NNSA's management of the nuclear security enterprise. It focuses on our reports issued from August 2000 to January 2012 on (1) NNSA's ability to produce adequate budget and cost

² GAO, *Department of Energy: National Laboratories Need Clearer Missions and Better Management*, [GAO/RCED-95-10](#) (Washington, D.C.: Jan. 27, 1995).

³ GAO, *Department of Energy: Views on the Progress of the National Nuclear Security Administration in Implementing Title 32*, [GAO-01-602T](#) (Washington, D.C.: Apr. 4, 2001); GAO, *NNSA Management: Progress in the Implementation of Title 32*, [GAO-02-93R](#) (Washington, D.C.: Dec. 12, 2001); and GAO, *Department of Energy: NNSA Restructuring and Progress in Implementing Title 32*, [GAO-02-451T](#) (Washington, D.C.: Feb. 26, 2002).

⁴ GAO, *High-Risk Series: An Update*, [GAO-11-278](#) (Washington, D.C.: February 2011).

data necessary to make informed management decisions; (2) NNSA's project and contract management; and (3) NNSA's oversight of safety and security performance in the nuclear security enterprise. Detailed information about scope and methodology can be found in our issued reports. We conducted the performance audit work that supports this statement in accordance with generally accepted government auditing standards. Those standards require that we plan and perform audits to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

DOE is responsible for a diverse set of missions, including nuclear security, energy research, and environmental cleanup. These missions are managed by various organizations within DOE and largely carried out by management and operating (M&O) contractors at DOE sites. According to federal budget data, NNSA is one of the largest organizations in DOE, overseeing nuclear weapons and nonproliferation-related missions at its sites. With a \$10.5 billion budget in fiscal year 2011—nearly 40 percent of DOE's total budget—NNSA is responsible for providing the United States with safe, secure, and reliable nuclear weapons in the absence of underground nuclear testing and maintaining core competencies in nuclear weapons science, technology, and engineering.

Under DOE's long-standing model of having unique M&O contractors at each site, management of its sites has historically been decentralized and, thus, fragmented. Since the Manhattan Project produced the first atomic bomb during World War II, NNSA, DOE, and predecessor agencies have depended on the expertise of private firms, universities, and others to carry out research and development work and efficiently operate the facilities necessary for the nation's nuclear defense. DOE's relationship with these entities has been formalized over the years through its M&O contracts—agreements that give DOE's contractors

unique responsibility to carry out major portions of DOE's missions and apply their scientific, technical, and management expertise.⁵

Currently, DOE spends 90 percent of its annual budget on M&O contracts, making it the largest non-Department of Defense contracting agency in the government. The contractors at DOE's NNSA sites have operated under DOE's direction and oversight but largely independently of one another. Various headquarters and field-based organizations within DOE and NNSA develop policies and NNSA site offices, collocated with NNSA's sites, conduct day-to-day oversight of the M&O contractors, and evaluate the contractors' performance in carrying out the sites' missions.

NNSA Does Not Have Reliable Enterprise-Wide Management Information on Program Budgets and Costs

As we have reported since 1999, NNSA has not had reliable enterprise-wide budget and cost data, which potentially increases risk to NNSA's programs. Specifically:

- In July 2003 and January 2007, we reported that NNSA lacked a planning and budgeting process that adequately validated contractor-prepared cost estimates used in developing annual budget requests.⁶ Establishing this process was required by the statute that created NNSA—Title 32 of the National Defense Authorization Act for Fiscal Year 2000.⁷ In particular, NNSA had not established an independent analysis unit to review program budget proposals, confirm cost estimates, and analyze budget alternatives. At the request of the Subcommittee on Energy and Water Development, Senate Committee on Appropriations, we are currently reviewing NNSA's planning and budgeting process, the extent to which NNSA has

⁵ M&O contracts are agreements under which the government contracts for the operation, maintenance, or support, on its behalf, of a government-owned or -controlled research, development, special production, or testing establishment wholly or principally devoted to one or more of the major programs of the contracting federal agency. Federal Acquisition Regulation, 48 C.F.R. § 17.601.

⁶ GAO, *Nuclear Weapons: Opportunities Exist to Improve the Budgeting, Cost Accounting, and Management Associated with the Stockpile Life Extension Program*, [GAO-03-583](#). (Washington, D.C.: July 28, 2003), and GAO, *National Nuclear Security Administration: Additional Actions Needed to Improve Management of the Nation's Nuclear Programs*, [GAO-07-36](#). (Washington, D.C.: Jan. 19, 2007).

⁷ 50 U.S.C. § 2452.

established criteria for evaluating resource trade-offs, and challenges NNSA has faced in validating its budget submissions. We expect to issue a report on this work later this year.

- In June 2010, we reported that NNSA could not identify the total costs to operate and maintain essential weapons activities' facilities and infrastructure.⁸ Furthermore, we found that contractor-reported costs to execute the scope of work associated with operating and maintaining these facilities and infrastructure likely significantly exceeded the budget for this program that NNSA justified to Congress.
- We reported in February 2011 that NNSA lacked complete data on (1) the condition and value of its existing infrastructure, (2) cost estimates and completion dates for planned capital improvement projects, (3) shared-use facilities within the nuclear security enterprise, and (4) critical human capital skills in its M&O contractor workforce that are needed to maintain the Stockpile Stewardship Program.⁹ As a result, NNSA does not have a sound basis for making decisions on how to most effectively manage its portfolio of projects and other programs and will lack information that could help justify future budget requests or target cost savings opportunities.
- In September 2011, we reported that, because of different accounting practices, NNSA could not accurately estimate planned cost savings that might result from a consolidated management contract for two of its production sites.¹⁰ Similarly, in January 2012, we reported on efforts NNSA sites have taken to streamline support functions and generate cost savings in a time of growing federal deficits and

⁸ GAO, *Nuclear Weapons: Actions Needed to Identify Total Costs of Weapons Complex Infrastructure and Research and Production Capabilities*, [GAO-10-582](#). (Washington, D.C.: June 21, 2010).

⁹ GAO, *Nuclear Weapons: NNSA Needs More Comprehensive Infrastructure and Workforce Data to Improve Enterprise Decision-making*, [GAO-11-188](#) (Washington, D.C.: Feb. 14, 2011).

¹⁰ GAO, *Modernizing the Nuclear Security Enterprise: The National Nuclear Security Administration's Proposed Acquisition Strategy Needs Further Clarification and Assessment*, [GAO-11-848](#). (Washington, D.C.: Sept. 20, 2011).

uncertainty over future federal budgets.¹¹ We found that it was difficult to compare or quantify total savings across sites because guidance for estimating savings is unclear and the methods used to estimate savings vary between sites.

The administration plans to request \$88 billion from Congress over the next decade to modernize the nuclear security enterprise and ensure that base scientific, technical, and engineering capabilities are sufficiently supported and the nuclear deterrent can continue to be safe, secure, and reliable. To adequately justify future presidential budget requests, NNSA must accurately identify these base capabilities and determine their costs. Without this information, NNSA risks being unable to identify return on its investment or opportunities for cost savings or to make fully informed decisions on trade-offs in a resource-constrained environment.

NNSA, recognizing that its ability to make informed enterprise-wide decisions is hampered by the lack of comprehensive data and analytical tools, is considering the use of computer models—quantitative tools that couple data from each site with the functions of the enterprise—to integrate and analyze data to create an interconnected view of the enterprise, which may help to address some of the critical shortcomings we identified. In July 2009, NNSA tasked its M&O contractors to form an enterprise modeling consortium. NNSA stated that the consortium is responsible for leading efforts to acquire and maintain enterprise data, enhance stakeholder confidence, integrate modeling capabilities, and fill in any gaps that are identified. The consortium has identified areas in which enterprise modeling projects could provide NNSA with reliable data and modeling capabilities, including capabilities on infrastructure and critical skills needs. In addition, we recently observed progress on NNSA's development of an Enterprise Program Analysis Tool that should give NNSA greater insight into its sites' cost reporting. The Tool also includes a mechanism to identify when resource trade-off decisions must be made, for example, when contractor-developed estimates for program requirements exceed the budget targets provided by NNSA for those programs. A tool such as this one could help NNSA obtain the basic data

¹¹ GAO, *Department of Energy: Additional Opportunities Exist to Streamline Support Functions at NNSA and Office of Science Sites*, [GAO-12-255](#). (Washington, D.C.: Jan. 31, 2012).

it needs to make informed management decisions, determine return on investment, and identify opportunities for cost saving.

NNSA Needs to Make Further Improvements to Its Management of Major Projects and Contracts

A basic tenet of effective management is the ability to complete projects on time and within budget. However, for more than a decade and in numerous reports, we have found that NNSA has continued to experience significant cost and schedule overruns on its major projects, principally because of ineffective oversight and poor contractor management. Specifically:

- In August 2000, we found that poor management and oversight of the National Ignition Facility construction project at Lawrence Livermore National Laboratory had increased the facility's cost by \$1 billion and delayed its scheduled completion date by 6 years.¹² Among the many causes for the cost overruns or schedule delays, DOE and Livermore officials responsible for managing or overseeing the facility's construction did not plan for the technically complex assembly and installation of the facility's 192 laser beams. They also did not use independent review committees effectively to help identify and correct issues before they turned into costly problems. Similarly, in April 2010, we reported that weak management by DOE and NNSA had allowed the cost, schedule, and scope of ignition-related activities at the National Ignition Facility to increase substantially.^{13, 14} Since 2005, ignition-related costs have increased by around 25 percent—from \$1.6 billion to over \$2 billion—and the planned completion date for these activities has slipped from the end of fiscal year 2011 to the end of fiscal year 2012 or beyond.

¹² GAO, *National Ignition Facility: Management and Oversight Failures Caused Major Cost Overruns and Schedule Delays*, [GAO/RCED-00-271](#) (Washington, D.C.: Aug. 8, 2000).

¹³ Ignition-related activities consist of the efforts separate from the facility's construction that have been undertaken to prepare for the first attempt at ignition—the extremely intense pressures and temperatures that simulate on a small scale the thermonuclear conditions created in nuclear explosions.

¹⁴ GAO, *Nuclear Weapons: Actions Needed to Address Scientific and Technical Challenges and Management Weaknesses at the National Ignition Facility*, [GAO-10-488](#) (Washington, D.C.: Apr. 8, 2010).

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- We have issued several reports on the technical issues, cost increases, and schedule delays associated with NNSA's efforts to extend, through refurbishment, the operational lives of nuclear weapons in the stockpile. For example, in December 2000, we reported that refurbishment of the W87 strategic warhead had experienced significant design and production problems that increased its refurbishment costs by over \$300 million and caused schedule delays of about 2 years.¹⁵ Similarly, in March 2009 we reported that NNSA and the Department of Defense had not effectively managed cost, schedule, and technical risks for the B61 nuclear bomb and the W76 nuclear warhead refurbishments.¹⁶ For the B61 life extension program, NNSA was only able to stay on schedule by significantly reducing the number of weapons undergoing refurbishment and abandoning some refurbishment objectives. In the case of the W76 nuclear warhead, NNSA experienced a 1-year delay and an unexpected cost increase of nearly \$70 million as a result of its ineffective management of one of the highest risks of the program—the manufacture of a key material known as Fogbank, which NNSA did not have the knowledge, expertise, or facilities to manufacture.
 - In October 2009, we reported on shortcomings in NNSA's oversight of the planned relocation of its Kansas City Plant to a new, more modern facility.¹⁷ Rather than construct a new facility itself, NNSA chose to have a private developer build it. NNSA would then lease the building through the General Services Administration for a period of 20 years. However, when choosing to lease rather than construct a new facility itself, NNSA allowed the Kansas City Plant to limit its cost analysis to a 20-year life cycle that has no relationship with known requirements of the nuclear weapons stockpile or the useful life of a production facility that is properly maintained. As a result, NNSA's financing decisions were not as fully informed and transparent as they could have been. If the Kansas City Plant had quantified potential cost savings to be realized over the longer useful life of the facility, NNSA

¹⁵ GAO, *Nuclear Weapons: Improved Management Needed to Implement Stockpile Stewardship Program Effectively*, [GAO-01-48](#) (Washington, D.C.: Dec. 14, 2000).

¹⁶ GAO, *Nuclear Weapons: NNSA and DOD Need to More Effectively Manage the Stockpile Life Extension Program*, [GAO-09-385](#) (Washington, D.C.: Mar. 2, 2009).

¹⁷ GAO, *Nuclear Weapons: National Nuclear Security Administration Needs to Better Manage Risks Associated with Modernization of Its Kansas City Plant*, [GAO-10-115](#) (Washington, D.C.: Oct. 23, 2009).

may have made a different decision as to whether to lease or construct a new facility itself.

- We reported in March 2010 that NNSA's plutonium disposition program was behind schedule in establishing a capability to produce the plutonium feedstock necessary to operate its Mixed-oxide Fuel Fabrication facility currently being constructed at DOE's Savannah River Site in South Carolina.¹⁸ In addition, NNSA had not sufficiently assessed alternatives to producing plutonium feedstock and had only identified one potential customer for the mixed-oxide fuel the facility would produce. In its fiscal year 2012 budget justification to Congress, NNSA reported that it did not have a construction cost baseline for the facility needed to produce the plutonium feedstock for the mixed-oxide fuel, although Congress had already appropriated over \$270 million through fiscal year 2009 and additional appropriation requests totaling almost \$2 billion were planned through fiscal year 2016. NNSA stated in its budget justification that it is currently considering options for producing necessary plutonium feedstock without constructing a new facility.
- In November 2010, we reported that NNSA's plans to construct a modern Uranium Processing Facility at its Y-12 National Security Complex in Oak Ridge, Tennessee, had experienced significant cost increases.¹⁹ Originally estimated in 2004 to cost from \$600 million to \$1.1 billion, estimated construction costs had more than doubled from \$1.4 billion to \$3.5 billion. Costs have continued to rise since we issued our report. As of September 2011, NNSA estimated that the facility would cost from \$4.2 billion to \$6.5 billion to construct—a nearly seven-fold cost increase. We are currently reviewing the cost and schedule estimates for another multi-billion dollar NNSA construction project—the Chemistry and Metallurgy Research Replacement nuclear facility at Los Alamos National Laboratory—at the request of the Subcommittee on Energy and Water Development,

¹⁸ GAO, *Nuclear Nonproliferation: DOE Needs to Address Uncertainties with and Strengthen Independent Safety Oversight of Its Plutonium Disposition Program*, [GAO-10-378](#) (Washington, D.C.: Mar. 26, 2010). Mixed-oxide fuel contains plutonium blended with natural uranium, reprocessed uranium, or depleted uranium.

¹⁹ GAO, *Nuclear Weapons: National Nuclear Security Administration's Plans for Its Uranium Processing Facility Should Better Reflect Funding Estimates and Technology Readiness*, [GAO-11-103](#) (Washington, D.C.: Nov. 19, 2010).

Senate Committee on Appropriations. We plan to issue our report next month.

As discussed above, NNSA remains on our high-risk list and remains vulnerable to fraud, waste, abuse, and mismanagement. DOE has recently taken a number of actions to improve management of major projects, including those overseen by NNSA. For example, DOE has updated program and project management policies and guidance in an effort to improve the reliability of project cost estimates, better assess project risks, and better ensure project reviews that are timely, useful and identify problems early. However, DOE needs to ensure that NNSA has the capacity—that is, the people and other resources—to resolve its project management difficulties and that it has a program to monitor and independently validate the effectiveness and sustainability of its corrective measures. This is particularly important as NNSA embarks on its long-term, multibillion dollar effort to modernize the nuclear security enterprise.

NNSA's Oversight of Safety and Security in the Nuclear Security Enterprise Has Been Questioned

Another underlying reason for the creation of NNSA was a series of security issues at the national laboratories. Work carried out at NNSA's sites may involve plutonium and highly enriched uranium, which are extremely hazardous. For example, exposure to small quantities of plutonium is dangerous to human health, so that even inhaling a few micrograms creates a long-term risk of lung, liver, and bone cancer and inhaling larger doses can cause immediate lung injuries and death. Also, if not safely contained and managed, plutonium can be unstable and spontaneously ignite under certain conditions. NNSA's sites also conduct a wide range of other activities, including construction and routine maintenance and operation of equipment and facilities that also run the risk of accidents, such as those involving heavy machinery or electrical mishaps. The consequences of such accidents could be less severe than those involving nuclear materials, but they could also lead to long-term illnesses, injuries, or even deaths among workers or the public. Plutonium and highly enriched uranium must also be stored under extremely high security to protect it from theft or terrorist attack.

In numerous reports, we have expressed concerns about NNSA's oversight of safety and security across the nuclear security enterprise. With regard to nuclear and worker safety:

- In October 2007, we reported that there had been nearly 60 serious accidents or near misses at NNSA's national laboratories since

2000.²⁰ These incidents included worker exposure to radiation, inhalation of toxic vapors, and electrical shocks. Although no one was killed, many of the accidents caused serious harm to workers or damage to facilities. For example, at Los Alamos in July 2004, an undergraduate student who was not wearing required eye protection was partially blinded in a laser accident. Accidents and nuclear safety violations also contributed to the temporary shutdown of facilities at both Los Alamos and Livermore in 2004 and 2005. In the case of Los Alamos, laboratory employees disregarded established procedures and then attempted to cover up the incident, according to Los Alamos officials.²¹ Our review of nearly 100 reports issued since 2000 found that the contributing factors to these safety problems generally fell into three key categories: (1) relatively lax laboratory attitudes toward safety procedures; (2) laboratory inadequacies in identifying and addressing safety problems with appropriate corrective actions; and (3) inadequate oversight by NNSA.

- We reported in January 2008 on a number of long-standing nuclear and worker safety concerns at Los Alamos.²² These concerns included, among other things, the laboratory's lack of compliance with safety documentation requirements, inadequate safety systems, radiological exposures, and enforcement actions for significant violations of nuclear safety requirements that resulted in civil penalties totaling nearly \$2.5 million.
- In October 2008, we reported that DOE's Office of Health, Safety, and Security—which, among other things, develops, oversees, and helps enforce nuclear safety policies at DOE and NNSA sites—fell short of fully meeting our elements of effective independent oversight of

²⁰ GAO, *Nuclear and Worker Safety: Actions Needed to Determine the Effectiveness of Safety Improvement Efforts at NNSA's Weapons Laboratories*, [GAO-08-73](#) (Washington, D.C.: Oct. 31, 2007).

²¹ For additional information on the 2004 temporary shutdown of facilities at Los Alamos, see GAO, *Stand-Down of Los Alamos National Laboratory: Total Costs Uncertain; Almost All Mission-Critical Programs Were Affected but Have Recovered*, [GAO-06-83](#) (Washington, D.C.: Nov. 18, 2005).

²² GAO, *Los Alamos National Laboratory: Information on Security of Classified Data, Nuclear Material Controls, Nuclear and Worker Safety, and Project Management Weaknesses*, [GAO-08-173R](#) (Washington, D.C.: Jan. 10, 2008).

nuclear safety.²³ For example, the office's ability to function independently was limited because it had no role in reviewing technical analyses that help ensure safe design and operation of nuclear facilities, and the office had no personnel at DOE sites to provide independent safety observations.

With regard to security:

- In June 2008, we reported that significant security problems at Los Alamos had received insufficient attention.²⁴ The laboratory had over two dozen initiatives under way that were principally aimed at reducing, consolidating, and better protecting classified resources but had not implemented complete security solutions to address either classified parts storage in unapproved storage containers or weaknesses in its process for ensuring that actions taken to correct security deficiencies were completed. Furthermore, Los Alamos had implemented initiatives that addressed a number of previously identified security concerns but had not developed the long-term strategic framework necessary to ensure that its fixes would be sustained over time. Similarly, in October 2009, we reported that Los Alamos had implemented measures to enhance its information security controls, but significant weaknesses remained in protecting the information stored on and transmitted over its classified computer network.²⁵ A key reason for this was that the laboratory had not fully implemented an information security program to ensure that controls were effectively established and maintained.
- In March 2009, we reported about numerous and wide-ranging security deficiencies at Livermore, particularly in the ability of

²³ GAO, *Nuclear Safety: Department of Energy Needs to Strengthen Its Independent Oversight of Nuclear Facilities and Operations*, [GAO-09-61](#) (Washington, D.C.: Oct. 23, 2008). GAO first developed its elements of effective independent oversight of nuclear safety in 1987 when Congress was considering legislation to establish the Defense Nuclear Facilities Safety Board. Key elements include, among other things, independence, technical expertise, and enforcement authority.

²⁴ GAO, *Los Alamos National Laboratory: Long-Term Strategies Needed to Improve Security and Management Oversight*, [GAO-08-694](#) (Washington, D.C.: June 13, 2008).

²⁵ GAO, *Information Security: Actions Needed to Better Manage, Protect, and Sustain Improvements to Los Alamos National Laboratory's Classified Computer Network*, [GAO-10-28](#) (Washington, D.C.: Oct. 14, 2009).

Livermore's protective force to assure the protection of special nuclear material and the laboratory's protection and control of classified matter.²⁶ Livermore's physical security systems, such as alarms and sensors, and its security program planning and assurance activities were also identified as areas needing improvement. Weaknesses in Livermore's contractor self-assessment program and the NNSA Livermore Site Office's oversight of the contractor contributed to these security deficiencies at the laboratory. According to one DOE official, both programs were "broken" and missed even the "low-hanging fruit." The laboratory took corrective action to address these deficiencies, but we noted that better oversight was needed to ensure that security improvements were fully implemented and sustained.

- We reported in December 2010 that NNSA needed to improve its contingency planning for its classified supercomputing operations.²⁷ All three NNSA laboratories had implemented some components of a contingency planning and disaster recovery program, but NNSA had not provided effective oversight to ensure that the laboratories' contingency and disaster recovery planning and testing were comprehensive and effective. In particular, NNSA's component organizations, including the Office of the Chief Information Officer, were unclear about their roles and responsibilities for providing oversight in the laboratories' implementation of contingency and disaster recovery planning.

In March 2010, the Deputy Secretary of Energy announced a new effort—the 2010 Safety and Security Reform effort—to revise DOE's safety and security directives and reform its oversight approach to "provide contractors with the flexibility to tailor and implement safety and security programs without excessive federal oversight or overly prescriptive departmental requirements." We are currently reviewing the reform of DOE's safety directives and the benefits DOE hopes to achieve from this effort for, among others, the House Committee on Energy and Commerce. We expect to issue our report next month. Nevertheless, our

²⁶ GAO, *Nuclear Security: Better Oversight Needed to Ensure That Security Improvements at Lawrence Livermore National Laboratory Are Fully Implemented and Sustained*, [GAO-09-321](#) (Washington, D.C.: Mar. 16, 2009).

²⁷ GAO, *Information Security: National Nuclear Security Administration Needs to Improve Contingency Planning for Its Classified Supercomputing Operations*, [GAO-11-67](#) (Washington, D.C.: Dec. 9, 2010).

prior work has shown that ineffective NNSA oversight of its contractors has contributed to many of the safety and security problems across the nuclear security enterprise and that NNSA faces challenges in sustaining improvements to safety and security performance.

Concluding Observations

NNSA faces a complex task in planning, budgeting, and ensuring the execution of interconnected activities across the nuclear security enterprise. Among other things, maintaining government-owned facilities that were constructed more than 50 years ago and ensuring M&O contractors are sustaining critical human capital skills that are highly technical in nature and limited in supply are difficult undertakings. Over the past decade, we have made numerous recommendations to DOE and NNSA to improve their management and oversight practices. DOE and NNSA have acted on many of these recommendations, and we will continue to monitor progress being made in these areas. In the current era of tight budgets, Congress and the American taxpayer have the right to know whether investments made in the nuclear security enterprise are worth the cost. However, NNSA currently lacks the basic financial information on the total costs to operate and maintain its essential facilities and infrastructure, leaving it unable to identify return on investment or opportunities for cost savings. NNSA is now proposing to spend decades and tens of billions of dollars to modernize the nuclear security enterprise, largely by replacing or refurbishing aging and decaying facilities at its sites across the United States. Given NNSA's record of weak management of its major projects, we believe that careful federal oversight will be critical to ensure this time and money are spent in as an effective and efficient manner as possible.

With regard to the concerns that DOE's and NNSA's oversight of the laboratories' activities have been excessive and that safety and security requirements are overly prescriptive and burdensome, we agree that excessive oversight and micromanagement of contractors' activities is not an efficient use of scarce federal resources. Nevertheless, in our view, the problems we continue to identify in the nuclear security enterprise are not caused by excessive oversight, but instead result from ineffective oversight. Given the critical nature of the work the nuclear security enterprise performs and the high-hazard operations it conducts—often involving extremely hazardous materials, such as plutonium and highly enriched uranium, that must be stored under high security to protect them from theft—careful oversight and stringent safety and security requirements will always be required at these sites

It is also important in an era of scarce resources that DOE and NNSA ensure that the work conducted by the nuclear security enterprise is primarily focused on its principal mission—ensuring the safety and reliability of the nuclear weapons stockpile. DOE has other national laboratories capable of conducting valuable scientific research on issues as wide-ranging as climate change or high-energy physics, but there is no substitute for the sophisticated capabilities and highly-skilled human capital present in the nuclear security enterprise for ensuring the credibility of the U.S. nuclear deterrent.

Chairman Turner, Ranking Member Sanchez, and Members of the Subcommittee, this completes my prepared statement. I would be pleased to respond to any questions you may have at this time.

GAO Contact and Staff Acknowledgments

If you or your staff have any questions about this testimony, please contact me at (202) 512-3841 or aloisee@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. GAO staff who made key contributions to this testimony are Allison Bawden, Ryan T. Coles, and Jonathan Gill, Assistant Directors, and Patrick Bernard, Senior Analyst.

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