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MODERNIZING THE NUCLEAR SECURITY ENTERPRISE

Observations on DOE's and NNSA's Efforts to Enhance Oversight of Security, Safety, and Project and Contract Management

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Natural Resources and Environment

March 2013

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GAO Highlights

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Highlights of GAO-13-482T, a testimony before the Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, House of Representatives.

Why GAO Did This Study

DOE and NNSA are responsible for managing nuclear weapon- and nonproliferation-related national security activities in national laboratories and other sites and facilities, collectively known as the nuclear security enterprise. Major portions of NNSA's mission are largely carried out by contractors at each site. GAO has designated contract management of major projects (i.e., those $750 million or more) at DOE and NNSA as a high risk area. Progress has been made, but GAO continues to identify security and safety problems at DOE and NNSA sites as well as project and contract management problems related to cost and schedule overruns on major projects.

This testimony addresses DOE's and NNSA's oversight of (1) security performance, (2) safety performance, and (3) project and contract management in the nuclear security enterprise. It is based on prior GAO reports issued from August 2000 to December 2012.

DOE and NNSA continue to act on the numerous recommendations GAO has made to improve management of the nuclear security enterprise. GAO will continue to monitor DOE's and NNSA's implementation of these recommendations.

View GAO-13-482T. For more information, contact David C. Trimble, (202) 512-3841 or trimbled@gao.gov

What GAO Found

The Department of Energy (DOE) and the National Nuclear Security Administration (NNSA), a separately organized agency within DOE, continue to face challenges in ensuring that oversight of security activities is effective. For example, in July 2012, after three trespassers gained access to the protected security area directly adjacent to one of the nation's most critically important nuclear weapon-related facilities, the Y-12 National Security Complex, DOE and NNSA took a number of immediate actions. These actions included repairing security equipment, reassigning key security personnel, and firing the Y-12 protective force contractor. As GAO and others have reported, DOE has a long history of security breakdowns and an equally long history of instituting remedies to fix these problems. For example, 10 years ago, GAO reported on inconsistencies among NNSA sites on how they assess contractors' security activities and, since that time, DOE has undertaken security initiatives to address these issues. GAO is currently evaluating these security reform initiatives.

DOE and NNSA continue to face challenges in ensuring that oversight of safety performance activities is effective. DOE and NNSA have experienced significant safety problems at their sites, and recent efforts to reform safety protocols and processes have not demonstrated sustained improvements. Long-standing DOE and NNSA management weaknesses have contributed to persistent safety problems at NNSA's national laboratories. For example, in October 2007, GAO reported that nearly 60 serious accidents or near misses had occurred at NNSA's national laboratories since 2000. DOE has undertaken a number of reforms to address persistent safety concerns. For example, in March 2010, the Deputy Secretary of Energy announced a reform effort to revise DOE's safety and security directives. However, GAO reported in September 2012 that DOE's safety reforms did not fully address continuing safety concerns that GAO and others identified in the areas of quality assurance, safety culture, and federal oversight and, in fact, may have actually weakened independent oversight.

DOE and NNSA have made progress but need to make further improvements to their contract and project management efforts. DOE has made progress in managing nonmajor projects—those costing less than $750 million—and in recognition of this progress, GAO narrowed the focus of its high-risk designation of DOE's Office of Environmental Management (EM) and NNSA to major contracts and projects. Specifically, as GAO noted in its December 2012 report on 71 DOE EM and NNSA nonmajor projects, GAO found the use of some sound management practices that were helping ensure successful project completion. However, major projects continue to pose a challenge for DOE and NNSA. For example, in December 2012, GAO reported that the estimated cost to construct the Waste Treatment and Immobilization Plant in Washington State had tripled to $12.3 billion since its inception in 2000, and the scheduled completion date had slipped by nearly a decade to 2019. Also, in March 2012, GAO reported that a now-deferred NNSA project to construct a new plutonium facility in Los Alamos, New Mexico, could cost as much as $5.8 billion, a nearly six-fold cost increase.

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Chairman Murphy, Ranking Member DeGette, and Members of the Subcommittee:

Thank you for the opportunity to discuss our work on the security, safety, and project management issues related to 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 nuclear weapon- and nonproliferation-related missions in research and development laboratories, production plants, and other facilities—known collectively as the nuclear security enterprise.[1] NNSA directs these national security missions, but work activities are largely carried out by management and operating (M&O) contractors at each site within the nuclear security enterprise. Working under M&O contracts, NNSA contractors apply their scientific, technical, and management expertise at NNSA's government-owned, contractor-operated sites.[2]

As we testified before this Subcommittee in September 2012,[3] questions have been raised about DOE's and NNSA's oversight of security, safety, and project and contract management for the nuclear security enterprise. For example, we first designated DOE's management of its contracts as an area at high risk of fraud, waste, abuse, and mismanagement in 1990 because of the department's record of inadequate management and oversight of its contractors. During the late 1990s, DOE experienced security problems at the nation's nuclear weapons laboratories and

[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 weapon 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.

[2]M&O contracts are agreements under which the federal 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 (2012).

[3]GAO, *Modernizing the Nuclear Security Enterprise: Observations on the National Nuclear Security Administration's Oversight of Safety, Security, and Project Management*, GAO-12-912T (Washington, D.C.: Sept. 12, 2012).

significant cost overruns on major projects (i.e., $750 million or more). According to a June 1999 report by the President's Foreign Intelligence Advisory Board, DOE's management of the nuclear weapons laboratories, while representing "science at its best," also embodied "security at its worst" because of "organizational disarray, managerial neglect, and a culture of arrogance." The advisory board urged Congress to create a new organization that, whether established as an independent agency or a semiautonomous agency within DOE, would have a clear mission, streamlined bureaucracy, and drastically simplified lines of authority and accountability. Responding to the advisory board's recommendations, Congress created NNSA under Title 32 of the National Defense Authorization Act for Fiscal Year 2000—the NNSA Act.[4] The NNSA Act established NNSA as a "separately organized agency" within DOE. The act established the position of DOE Under Secretary for Nuclear Security, who was also designated as the Administrator of NNSA. The Secretary of Energy and the Deputy Secretary of Energy were allowed to establish policy for NNSA and to give direction to NNSA through the Administrator; however, other DOE employees were prohibited from directing the activities of individual NNSA employees. DOE directives remain the primary means to establish, communicate, and institutionalize policies, requirements, responsibilities, and procedures for multiple departmental elements, including NNSA, but the act gives the NNSA Administrator the authority to establish NNSA-specific policies, unless disapproved by the Secretary of Energy. NNSA does this through the issuance of Policy Letters.[5]

NNSA's creation, however, has not yet had the desired effect of fully resolving long-standing management problems. For example, NNSA and DOE's Office of Environmental Management (EM) remain on our high-risk list.[6] Furthermore, we have frequently reported on security incidents and safety issues that have contributed to the temporary shutdown of facilities, such as at Los Alamos and Lawrence Livermore National

[4]Pub. L. No. 106-65, 113 Stat. 512, 953 (1999).

[5]NNSA, *Policy Letters: NNSA Policies, Supplemental Directives, and Business Operating Procedures,* NA SD 251.1 (Washington, D.C.: July 5, 2011).

[6]GAO, *High-Risk Series: An Update*, GAO-13-283 (Washington, D.C.: Feb. 2013). We have shifted our focus concerning the high-risk area to major DOE-EM and NNSA major projects (i.e., those $750 million or more).

Laboratories in 2004 and 2005,[7] as well as the safety and security initiatives that contractors at these laboratories put in place to help ensure improvement. More recently, at the Y-12 National Security Complex, in July 2012, three trespassers gained access to the protected security area directly adjacent to one of the nation's most critically important nuclear weapon-related facilities without being interrupted by the security measures in place. According to DOE's Inspector General, this security incident was unprecedented and represented multiple system failures including failures to maintain critical security equipment, respond properly to alarms, and understand security protocols.[8] Furthermore, the Inspector General found that contractor governance and federal oversight did not identify and correct early indications of these multiple system breakdowns.

DOE's management approach to security over the years has shifted in part due to concerns raised by some national laboratory, DOE, and NNSA officials. These officials believed that DOE's and NNSA's oversight of the laboratories' activities had become excessive and that the safety and security requirements for the laboratories are overly prescriptive and burdensome, which had resulted in a negative effect on the quality of science performed at these laboratories. Partly in response to these concerns, DOE and NNSA embarked on reforms in 2010 and 2011 that sought to streamline requirements and institute what has been called by the National Research Council, the DOE Inspector General, the DOE Office of Health and Safety Performance, and the Defense Nuclear Facilities Safety Board (Safety Board) a "hands-off, eyes-on" role for federal oversight. This approach placed more reliance on contractors' self-oversight through its contractor assurance systems to ensure such things as effective safety and security performance.[9] Building on this theme, in February 2012, the National Research Council found that

[7]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).

[8]DOE Office of Inspector General, *Inquiry into the Security Breach at the National Nuclear Security Administration's Y-12 National Security Complex*, DOE/IG-0868 (August 2012).

[9]These systems include management controls that help ensure the department's program missions and activities are executed in an effective, efficient, and safe manner. We are currently evaluating the implementation of contractor assurance systems at NNSA sites and NNSA's oversight of these systems.

"safety and security systems at the [NNSA] Laboratories have been strengthened to the point where they no longer need special attention."[10]

In this context, there have been calls to enhance NNSA's ability to operate independently of DOE. For example, the Defense Science Board proposed in 2006 that a completely independent nuclear weapons agency be created.[11] In January 2007, we reported that former senior DOE and NNSA officials with whom we spoke generally did not favor removing NNSA from DOE.[12] Furthermore, in a June 2012 report, we concluded that such a drastic change was unnecessary to produce an effective organization,[13] and we generally hold this view today. However, in the wake of the Y-12 security incident and persistent problems with major projects, there have been renewed calls to reexamine NNSA's organization. Most recently, the Fiscal Year 2013 National Defense Authorization Act created the Congressional Advisory Panel on the Governance of the Nuclear Security Enterprise to examine options and make recommendations for revising the governance structure, mission, and management of the nuclear security enterprise.

My testimony today discusses DOE's and NNSA's management of the nuclear security enterprise. It focuses on our reports issued from August 2000 to December 2012 on oversight of (1) security performance, (2) safety performance, and (3) project and contract management in the nuclear security enterprise. Detailed information about the scope and methodology can be found in our previously 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 the audit to obtain

[10]National Research Council, *Managing for High-Quality Science and Engineering at the NNSA National Security Laboratories*, (Washington, D.C.: Feb. 15, 2012).

[11]The Defense Science Board provides the Department of Defense with independent advice and recommendations on matters relating to the department's scientific and technical enterprise. See Defense Science Board Task Force, *Nuclear Capabilities* (Washington, D.C.: Dec. 2006).

[12]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).

[13]GAO, *Modernizing the Nuclear Security Enterprise: Observations on the Organization and Management of the National Nuclear Security Administration*, GAO-12-867T (Washington, D.C.: June 27, 2012).

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 organizations within DOE and largely carried out by M&O contractors at various DOE sites. According to federal budget data, NNSA is one of the largest organizations in DOE, overseeing nuclear weapons, nuclear nonproliferation, and naval reactors missions at its sites. With an $11 billion budget in fiscal year 2012—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. Ensuring a safe and reliable nuclear weapons stockpile is an extraordinarily complicated task 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 its creation. To support these capabilities into the future, in 2011, the administration announced plans to request $88 billion from Congress over the next decade to operate and modernize the nuclear security enterprise.

As discussed earlier, work activities to support NNSA's national security missions are largely carried out by M&O contractors. This arrangement has historical roots. 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. 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.

DOE generally regulates the safety of its own nuclear facilities and operations at its sites. In contrast, the Nuclear Regulatory Commission

(NRC) generally regulates commercial nuclear facilities, and the Occupational Safety and Health Administration (OSHA) generally regulates worker safety at commercial industrial facilities.[14] However, because of the dangerous nature of work conducted at many sites within the nuclear security enterprise—handling nuclear material such as plutonium, manufacturing high explosives, and various industrial operations that use hazardous chemicals—oversight of the nuclear security enterprise is multifaceted. First, DOE policy states that its M&O contractors are expected to develop and implement an assurance system, or system of management controls, that helps ensure the department's program missions and activities are executed in an effective, efficient, and safe manner.[15] Through these assurance systems, contractors are required to perform self-assessments as well as identify and correct negative performance trends. Second, NNSA site offices, which are collocated with NNSA sites, oversee the performance of M&O contractors. Site office oversight includes communicating performance expectations to the contractor, reviewing the contractor's assurance system, and conducting contractor performance evaluations. Third, DOE's Office of Health, Safety, and Security—especially its Office of Independent Oversight—conducts periodic appraisals to determine if NNSA officials and contractors are complying with safety and security requirements.[16] Fourth, NNSA receives safety assessments and recommendations from other organizations, most prominently the Safety Board—an independent executive branch agency created by Congress to assess safety conditions and operations at DOE's defense nuclear facilities.[17] To address public health and safety issues, the Safety Board is authorized to make recommendations to the Secretary of Energy, who

[14]DOE regulates the safety of most of its own sites with nuclear operations; NRC regulates several DOE nuclear facilities, and OSHA regulates occupational safety at DOE sites that have no nuclear function.

[15]DOE, *Department of Energy Oversight Policy*, DOE P 226.1B (Washington, D.C.: Apr. 25, 2011). Contractor assurance systems are to cover the following operational aspects: (1) environment, safety, and health; (2) safeguards and security; (3) emergency management; and (4) cyber security.

[16]DOE reorganized offices within its Office of Health, Safety, and Security. The Office of Independent Oversight merged with the Office of Enforcement and was renamed the Office of Enforcement and Oversight. For the purposes of this report, we refer to it as the Office of Independent Oversight.

[17]The Safety Board provides oversight for all NNSA sites except the Kansas City Plant, which manufactures non-nuclear components.

may then accept or reject, in whole or in part, the recommendations. If the Secretary of Energy accepts the recommendations, the Secretary must prepare an implementation plan.

DOE and some of its contractors have viewed this multifaceted oversight to be overly burdensome. To address this issue, in March 2010 the Deputy Secretary of Energy announced a reform effort to revise DOE's safety and security directives and modify the department's 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." In the memorandum announcing this effort, the Deputy Secretary noted that burdensome safety requirements were affecting the productivity of work at DOE's sites and that reducing this burden on contractors would lead to measurable productivity improvement. The Deputy Secretary noted that DOE's Office of Health, Safety and Security in 2009 had begun reforming its approach to enforcement and oversight. Similar to, but independent of DOE's safety and security reform effort, in February 2011, NNSA initiated its "governance transformation" project, which involved revising the agency's business model to, among other things, place more reliance on contractors' self-oversight through its contractor assurance system to ensure such things as effective safety and security performance. NNSA's non-nuclear Kansas City Plant completed implementation of this new business model, and other NNSA sites—such as the Nevada National Security Site and the Y-12 National Security Complex—were in the process of implementing it, too, when the Y-12 security incident occurred.

DOE's and NNSA's Oversight of Security Performance Continues to Face Challenges

In response to the Y-12 security breach, multiple investigations and reviews of the incident were performed by NNSA, the DOE Office of Inspector General, and the DOE Office of Independent Oversight. These reviews identified numerous problems with NNSA's and its contractors' performance, including: physical security systems, such as alarms; protective force (i.e., NNSA's heavily armed, contractor guard forces) training and response; failures to correct numerous known problems; and weaknesses in contract and resource management. In addition, at the request of the Secretary of Energy, an independent panel, composed of three former executives from Federal agencies and the private sector, and a NNSA Security Task Force found broader and systemic security issues across the nuclear security enterprise. The Secretary's panel in December 2012 analyzed various models for providing security at DOE and NNSA sites but generally found that improvements to the security culture, management, and oversight were necessary, in addition to having

an effective organizational structure. In addition, the leader of the NNSA Security Task Force testified before the House Armed Services Committee in February 2013 about significant deficiencies in NNSA's entire security organization, oversight, and culture.

In response to the Y-12 security incident and these findings, DOE and NNSA took a number of immediate actions, including repairing security equipment, reassigning key security personnel, and firing the Y-12 protective force contractor. In February 2013, the Acting NNSA Administrator committed to implementing a three-tiered oversight process involving contractor self-assessment, NNSA evaluation of site performance, and independent oversight by DOE's Office of Independent Oversight. The Acting Administrator testified before the House Armed Services Committee that she believed that such actions will help instill a culture that embraces security as an essential element of NNSA's missions.

In assessing DOE's actions to address the security breakdowns at Y-12, a central question will be whether these latest actions taken will produce sustained improvements in security at Y-12 and across the nuclear security enterprise. As we and others have reported, DOE has a long history of security breakdowns and an equally long history of instituting responses and remedies to "fix" these problems. For example, in examining the Y-12 security incident, NNSA's former Acting Chief of Defense Nuclear Security and the leader of the NNSA's Security Task Force testified in February 2013 about problems with NNSA's federal security organization including poorly defined roles and responsibilities for its headquarters and field security organizations, inadequate oversight and assessments of site security activities, and issues with overseeing contractor actions and implementing improvements. As noted in table 1, 10 years ago we reported on very similar problems, and since that time DOE has undertaken numerous security initiatives to address them. We have not evaluated these recent initiatives but we have ongoing work to evaluate them as part of our review on security reform for the Subcommittee, which we will complete later this year.

Table 1: Comparison of GAO 2003 Findings Regarding NNSA's Federal Security Organization with NNSA Security Task Force's February 2013 Findings

	GAO May 2003 Findings	NNSA Security Task Force February 2013 Findings
Defining clear roles and responsibilities	NNSA has not fully defined clear roles and responsibilities for its headquarters and site operations.	NNSA security line management authority is ill-defined. There are overlapping lines of authority and a mixing of staff and line functions.
Assessing sites' security activities	There are inconsistencies among NNSA sites on how they assess contractors' security activities. Consequently, NNSA cannot be assured that all facilities are subject to comprehensive annual assessments as required by DOE policy.	NNSA does not have an adequate security performance assessment process or capability. NNSA has come to rely overwhelmingly on federal staff reviewing contractor-provided data, rather than effectively assessing performance itself.
Overseeing contractors' actions and implementing long-term improvements	NNSA contractors do not consistently conduct required analyses in preparing security corrective program action plans. Security performance at sites may not be maximized because corrective security program actions are developed without fully considering root causes, risks posed, or costs and benefits of taking corrective action.	NNSA has attempted to correct some identified issues over the years, but it has not adequately emphasized security mission performance. Recent DOE and NNSA reforms have deemphasized performance verification by federal staff, resulting in a weakened federal security assessment program.
Allocating staff	NNSA has shortfalls at its site offices in number and expertise of staff, which could make it more difficult for site offices to effectively oversee security activities.	The NNSA federal security function is not properly organized or staffed.

Sources: GAO, *Nuclear Security: NNSA Needs to Better Manage Its Safeguards and Security Program*, GAO-03-471 (Washington, D.C.: May 30, 2003); and Hearing on Nuclear Security: Actions, Accountability, and Reform, Before the Subcommittee on Strategic Forces, House Armed Services Committee, 113th Cong. (Feb. 28, 2013) (Statement of Brigadier General Sandra E. Finan, Commander, Air Force Nuclear Weapons Center. Testimony based on Previous Position as Acting Chief of Defense Nuclear Security, NNSA).

It is also important to note that NNSA's long-standing security problems are not limited to Y-12. DOE's and NNSA's work with nuclear materials such as plutonium and highly enriched uranium, nuclear weapons and their components, and large amounts of classified data require extremely high security, however, as we and DOE have reported, NNSA and DOE have a long history of poor security performance across the nuclear security enterprise, most notably at Los Alamos and Livermore national laboratories, as well as ongoing struggles to sustain security improvements, including information security.[18]

[18] We note that over the past decade, the DOE Inspector General and Office of Independent Oversight periodically identified serious security issues at almost all of NNSA's sites, including Sandia National Laboratories; the Nevada National Security Site, Pantex, and prior to the July 2012 security incident, the Y-12 National Security Complex.

Los Alamos National Laboratory

As we noted in our September 2012 testimony,[19] Los Alamos National Laboratory (Los Alamos) experienced a number of high-profile security incidents in the previous decade that were subject to congressional hearings, including some held by this Subcommittee. Many of these incidents focused on Los Alamos's inability to account for and control its classified resources. These incidents include the transfer or removal of classified information from authorized work areas or the laboratory itself, the temporary loss of two hard drives containing nuclear weapon design information, and difficulties in accounting for classified removable electronic media. In addition to these well-publicized incidents, security evaluations through 2007 identified other persistent, systemic security problems at Los Alamos. These problems included weaknesses in controlling and protecting classified resources, inadequate controls over special nuclear material, inadequate self-assessment activities, and weaknesses in the process that Los Alamos uses to ensure it corrects identified security deficiencies. Partly as a result of these findings, as we reported in 2008,[20] Los Alamos underwent a 10 month shut-down of operations in 2004 and experienced a change in contractors in 2005. Moreover, the Secretary of Energy issued a compliance order in 2007 requiring Los Alamos to implement specific corrective actions to, among other things, address long-standing deficiencies in its classified information programs. We reported in January 2008 and testified before this Subcommittee in September 2008 that Los Alamos had experienced a period of improved security performance but that it was too early to determine whether NNSA and Los Alamos could sustain this level of improvement.[21]

Lawrence Livermore National Laboratory

In March 2009, we reported on numerous and wide-ranging security deficiencies at Lawrence Livermore National Laboratory (Livermore), particularly in the ability of Livermore's protective forces to ensure the

[19] GAO-12-912T.

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

[21] 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), and GAO, *Nuclear Security: Los Alamos National Laboratory Faces Challenges in Sustaining Physical and Cyber Security Improvements,* GAO-08-1180T (Washington, D.C.: Sep. 25, 2008).

protection of special nuclear material and the laboratory's protection and control of classified matter.[22] We also identified Livermore's physical security systems, such as alarms and sensors, and its security program planning and assurance activities, as areas needing improvement. Weaknesses in Livermore's contractor self-assessment program and the Livermore Site Office's oversight of the contractor contributed to these security deficiencies at the laboratory. According to one DOE Office of Independent Oversight 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. In September 2012, NNSA and Livermore completed efforts to move the site's most sensitive nuclear material to other sites, thereby easing the site's security requirements.

Information Security

We also have reported extensively on NNSA's challenges in maintaining effective and secure information security systems, particularly at Los Alamos. For example, in June 2008, we reported that significant information security problems at Los Alamos had received insufficient attention.[23] The laboratory had over two dozen initiatives under way that were principally aimed at reducing, consolidating, and better protecting classified resources. However, the laboratory had not implemented complete security solutions to address either the problems of classified parts storage in unapproved storage containers or weaknesses in its process for ensuring that actions taken to correct security deficiencies were completed. In addition, in October 2009 we reported that Los Alamos needed to better protect its classified network.[24] Specifically, we found significant weaknesses remained in protecting the confidentiality, integrity, and availability of information stored on and transmitted over its classified computer network. Moreover, we found the laboratory's

[22]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).

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

[24]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).

decentralized approach to information security program management has led to inconsistent implementation of policy.

DOE and NNSA's Oversight of Safety Performance Continues to Face Challenges

DOE and NNSA have experienced significant safety problems at their sites, and recent efforts to reform safety protocols and processes have not demonstrated sustained improvements. As we testified in September 2012 before this Subcommittee,[25] long-standing DOE and NNSA management weaknesses have contributed to persistent safety problems at NNSA's national laboratories. For example, in October 2007, we reported that nearly 60 serious accidents or near misses had occurred at NNSA's national laboratories since 2000.[26] These accidents included worker exposure to radiation, inhalation of toxic vapors, and electrical shocks. Although no one was killed, many of these accidents caused serious harm to workers or damage to facilities. As we also reported, at Los Alamos in July 2004, an undergraduate student who was not wearing required eye protection was partially blinded in a laser accident. Our review of nearly 100 safety studies—including accident investigations and independent assessments by the Safety Board and others 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 site offices.[27] DOE's Office of Inspector General has also raised concerns about safety oversight by NNSA's site offices. Specifically, the Inspector General reported in June 2011 that NNSA's Livermore Site Office was not sufficiently overseeing its contractor to ensure that corrective actions were fully and effectively implemented for a program designed to limit worker exposure to beryllium, a hazardous metal essential for nuclear operations.[28]

[25]GAO-12-912T.

[26]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).

[27]GAO-08-73.

[28]DOE Office of Inspector General, *Implementation of Beryllium Controls at Lawrence Livermore National Laboratory,* DOE/IG-0851 (Washington, D.C.: June 17, 2011).

DOE has undertaken a number of reforms to address persistent safety concerns. In March 2010, the Deputy Secretary of Energy announced a reform effort to revise DOE's safety and security directives. The reform effort was aimed at modifying the department's 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." As we reported to this Subcommittee in April 2012,[29] this reform effort reduced the number of safety related directives from 80 to 42 by eliminating or combining requirements the department determined were unclear, duplicative, or too prescriptive and by encouraging the use of industry standards. However, as we noted in September 2012 before this Subcommittee, DOE's safety reforms did not fully address safety concerns that we, as well as others, have identified in the areas of quality assurance, safety culture, and federal oversight and, in fact, these reforms may have actually weakened independent oversight. We stated, for example, that while DOE policy notes that independent oversight is integral to help ensure the effectiveness of safety performance, DOE's Office of Independent Oversight staff must now coordinate their assessment activities with NNSA site office management to maximize the use of resources. This arrangement raised our concern about whether Office of Independent Oversight staff would be sufficiently independent from site office management. In our April 2012 report, we recommended, among other things, that DOE develop a detailed reform plan and clearly define the oversight roles and responsibilities of DOE's Office of Independent Oversight staff to ensure that their work is sufficiently independent from the activities of DOE site office and contractor staff. DOE has taken steps to respond to these recommendations, including developing a plan aimed at improving safety management and drafting a memo from the Secretary of Energy reconfirming the department's commitment to independent oversight of safety and security.

However, since our September 2012 testimony,[30] concerns continue to be raised about safety performance and oversight at several NNSA sites, which indicate DOE's safety reforms have not brought about a sustained change in safety practices. The following are examples:

[29]GAO, *Nuclear Safety: DOE Needs to Determine the Costs and Benefits of Its Safety Reform Effort*, GAO-12-347 (Washington, D.C.: Apr. 20, 2012).

[30]GAO-12-912T.

- A November 2012 report by DOE's Office of Independent Oversight raised concerns about safety culture issues at NNSA's Pantex Plant. Among the concerns were reluctance by workers to raise safety problems for fear of retaliation and a perception that cost took priority over safety.
- At an October 2012 public hearing in Knoxville, Tennessee, the Safety Board noted that safety controls to prevent or mitigate consequences from accidents had not been fully incorporated into the design of a new uranium processing facility at Y-12. The Safety Board noted the facility's safety basis—a technical analysis that identifies potential accidents and hazards associated with a facility's operations and outlines controls to mitigate or prevent their impact on workers and the public—did not adequately address controls to protect workers or the public in the case of an earthquake or small fires, and did not adequately calculate reasonably conservative radiation exposure consequences that could lead to putting greater safety into the facility's design. The Safety Board further noted that these deficiencies raise the potential for significant impacts on public and worker safety.
- A January 2013 Office of Independent Oversight report reviewing the Los Alamos Site Office assessment of the contractor corrective action system found that the contractor had not implemented effective corrective actions for identified safety system problems. This report noted that the site office concluded that more than half of the 62 safety system items needing corrective action had been closed without adequate action or sufficient documentation. Moreover, in October 2012, NNSA issued a Preliminary Notice of Violation to a Los Alamos contractor for repeated electrical safety problems. NNSA's notice stated that insufficient oversight of subcontractor work by the contractor safety staff was among the contributing factors. NNSA fined the contractor $262,500.

DOE and NNSA Have Made Progress but Further Improvements Needed on Project and Contract Management

A basic tenet of effective management is the ability to complete projects on time and within budget. DOE has taken a number of actions to improve management of projects, including those overseen by NNSA. For example, DOE has updated project and contract 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 and useful and identify problems early. In addition, in December 2010, the Deputy Secretary of Energy convened a DOE Contract and Project Management Summit to discuss strategies for additional improvement in contract and project management. The participants identified barriers to improved performance and reported in

April 2012 on the status of initiatives to address these barriers. DOE has continued to release guides for implementing its revised order for Program and Project Management for the Acquisition of Capital Assets (DOE O 413.3B), such as for cost estimating, using earned value management, and forming project teams. Further, DOE has taken steps to enhance project management and oversight by requiring peer reviews and independent cost estimates for projects with values of more than $100 million and by improving the accuracy and consistency of data in its central repository for project data.

DOE has made progress in managing nonmajor projects—those costing less than $750—million and in recognition of this progress, we narrowed the focus of our high-risk designation to major contracts and projects. Specifically, as we noted in our October 2012 report on DOE's EM cleanup projects funded by the American Recovery and Reinvestment Act, at the time of our analysis, 78 of 112 projects had been completed.[31] Of those completed projects, 92 percent met the performance standard of completing project work scope without exceeding the cost target by more than 10 percent, according to EM data. However, we made four recommendations to DOE in this report aimed at improving how EM manages and documents projects, particularly with respect to establishing key performance parameters such as project scope targets and baselines for cost and schedule. DOE concurred with all of our recommendations, recognizing that improvements could be made and that lessons learned from these projects can be applied to EM's broader portfolio of projects and activities. In addition, in December 2012, we reported that EM and NNSA were making some progress in managing the 71 nonmajor construction and cleanup projects that we reviewed and are expected to cost an estimated $10.1 billion in total.[32] For example, we identified some NNSA and EM nonmajor projects that used sound project management practices, such as the application of effective acquisition strategies, to help ensure the successful completion of these projects. We also recommended that NNSA and EM clearly define, document, and track the scope, cost, and completion date targets for each of their nonmajor

[31]GAO, *Recovery Act: Most DOE Projects Are Complete, but Project Management Guidance Could Be Strengthened*, GAO-13-23 (Washington D.C.: Oct. 15, 2012).

[32]GAO, *Department of Energy: Better Information Needed to Determine If Nonmajor Projects Meet Performance Targets*, GAO-13-129 (Washington, D.C.: Dec. 19, 2012).

projects and that EM clearly identify critical occupations and skills in its workforce plans. NNSA and EM agreed with these recommendations.

Notwithstanding these positive developments for nonmajor projects, major projects (i.e., those $750 million or more) continue to pose a challenge for DOE and NNSA. Since 1990 when we placed contract and project management on the high-risk list, we have reported on problems that principally involve ineffective oversight and poor management of contractors. Our recent work, as well as reporting by DOE, indicates that these problems continue. Examples are as follows:

- In December 2012, we reported that the estimated cost to construct the Waste Treatment and Immobilization Plant in Washington State had almost tripled to $12.3 billion since the project's inception in 2000, and the scheduled completion date had slipped by nearly a decade to 2019.[33] Moreover, we found that DOE's incentives and management controls were inadequate for ensuring effective project management and we also found instances where DOE prematurely rewarded the contractor for resolving technical issues and completing work.
- In March 2012, we reported that NNSA's project to construct a new plutonium facility, the Chemistry and Metallurgy Research Replacement Nuclear Facility, at Los Alamos could cost as much as $5.8 billion, a nearly six-fold increase from its original estimate.[34] While the facility may be large enough to support nuclear weapon stockpile requirements, our March 2012 report found that it is unclear if the facility will be large enough to accommodate DOE's non-weapon activities that involve plutonium—such as nonproliferation, nuclear forensics, and nuclear counterterrorism programs—because the department has not comprehensively studied its long-term research and storage needs.
- 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

[33]GAO, *Hanford Waste Treatment Plant: DOE Needs to Take Action to Resolve Technical and Management Challenges*, GAO-13-38 (Washington, D.C.: Dec. 19, 2012).

[34]GAO, *Modernizing the Nuclear Security Enterprise: New Plutonium Research Facility at Los Alamos May Not Meet All Mission Needs*, GAO-12-337 (Washington, D.C.: Mar. 26, 2012).

increases.[35] More recently, in 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 from the original estimate.

- 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.[36] We reported that, since 2005, ignition-related costs have increased by around 25 percent—from $1.6 billion in 2005 to over $2 billion in 2010—and that the planned completion date for these activities had slipped from the end of fiscal year 2011 to the end of fiscal year 2012 or beyond. Ten years earlier, in August 2000, we had reported 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.[37]
- In March 2010, we reported that NNSA's Mixed-Oxide Fuel Fabrication Facility currently being constructed at DOE's Savannah River Site in South Carolina had experienced delays, but project officials said that they expected to recover from these delays by the end of 2010 and planned for the start of operations on schedule in 2016. In addition, after spending about $730 million on design, NNSA has cancelled the pit disassembly and conversion facility and is now planning to use existing facilities at DOE's Savannah River and Los Alamos sites and will add equipment to the mixed oxide facility. NNSA is working on a cost and schedule estimate for the use of these existing facilities and for adding the additional equipment.

We have also 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

[35]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).

[36]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. See 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).

[37]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).

stockpile. For example, 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.[38] 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. Earlier, in December 2000, we similarly had 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.[39]

In conclusion, the actions that DOE and NNSA have taken to address weaknesses in oversight of security, safety, and contract and project management are very important, but problems persist. While we have noted progress in the area of project management, we also observe that NNSA and DOE EM have not begun a new major project since taking these actions. The Y-12 security incident was an unprecedented event for the nuclear security enterprise and perhaps indicates that NNSA's organizational culture, over a decade after the agency was created to address security issues, still has not embraced security as an essential element of its missions. In terms of safety, DOE has recently taken the initiative to examine the safety culture at its sites. We believe, as do other organizations, including the DOE Inspector General and Safety Board, that a "hands off, eyes on" oversight approach for security, safety and contract and project management is insufficient and unwarranted until the department can demonstrate sustained improvement in all three areas. We will continue to monitor DOE's and NNSA's implementation of actions to resolve its safety, security, and contract and project management difficulties and to assess the impact of these actions.

Chairman Murphy, Ranking Member DeGette, 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.

[38]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).

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

GAO Contact and Staff Acknowledgments

If you or your staff have any questions about this testimony, please contact me at (202) 512-3841 or trimbled@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, Jonathan Gill, and Kiki Theodoropoulos, Assistant Directors; and Nancy Kintner-Meyer, Michelle Munn, and Jeff Rueckhaus, Senior Analysts.