

**FY 2016  
BUDGET REQUEST  
TO THE CONGRESS**

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**Defense Nuclear Facilities Safety Board**

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February 2, 2015

# **GOVERNMENT PERFORMANCE RESULTS ACT (GPRA) MODERNIZATION ACT**

## **GPRA Strategic Planning Reporting Requirements**

The GPRA Modernization Act of 2010 requires each agency to make available on its website a strategic plan establishing general strategic goals and objectives for a period of not less than four years. The Defense Nuclear Facilities Safety Board's (Board) Strategic Plan for Fiscal Years (FY) 2014-2018 is available on the Internet at [www.dnfsb.gov](http://www.dnfsb.gov). In addition, agencies are required to develop an Annual Performance Plan (APP) covering a two-year period with performance goals that contribute toward achieving the strategic plan's goals and objectives, and an Annual Performance Report (APR) comparing actual performance achieved with the performance goal established. The Board's APP for FY 2015 and FY 2016, as well as its APR for FY 2011 through FY 2014, are included in this Budget Request in accordance with the requirements of OMB Circular A-11.

For a comprehensive review of the Board's activities to improve the safety of the Department of Energy's (DOE) defense nuclear facilities, see the Board's Annual Reports to Congress, which may be reviewed at the Board's public website (referenced above).

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# 1. INTRODUCTION

## Defense Nuclear Facilities Safety Board FY 2016 Congressional Budget Request

### APPROPRIATION & EXPENSE SUMMARY

(Tabular in thousands)

#### OPERATING EXPENSES

	ACTUAL FOR FY 2014	FINANCIAL PLAN FOR FY 2015	BUDGET REQUEST FOR FY 2016
New Budget Authority	28,000*	28,500**	29,150
Obligations	26,810	29,802	32,298
Outlays	25,431	29,206	30,360

\* Consolidated Appropriations Act, 2014, Pub. L. No. 113-76

\*\* Consolidated and Further Continuing Appropriations Act, 2015, Pub. L. No. 113-235

Enabling Statute:

National Defense Authorization Act, FY 1989, Pub. L. No. 100-456, § 1441, 102 Stat. 1918 (1988), amended the Atomic Energy Act of 1954 (42 U.S.C. § 2286, *et seq.*)

As Amended by:

National Defense Authorization Act, FY 1991, Pub. L. No. 101-510, § 3201, 104 Stat. 1485 (1990).  
National Defense Authorization Act, FYs 1992 and 1993, Pub. L. No. 102-190, § 3201, 105 Stat. 1290 (1991).  
Energy Policy Act of 1992, Pub. L. No. 102-486, 106 Stat. 2776 (1992).  
National Defense Authorization Act, FY 1994, Pub. L. No. 103-160, § 3201, 107 Stat. 1547 (1993).  
Federal Reports Elimination Act of 1998, Pub. L. No. 105-362, 112 Stat. 3280 (1998).  
National Defense Authorization Act, FY 2001, Pub. L. No. 106-398, § 3201, 114 Stat. 1654 (2000).  
National Defense Authorization Act, FY 2003, Pub. L. No. 107-314, § 3201, 116 Stat. 2458 (2002).  
National Defense Authorization Act, FY 2013, Pub. L. No. 112-239, § 3201, 126 Stat. 1632 (2013).  
Carl Levin and Howard P. 'Buck' McKeon National Defense Authorization Act, FY 2015, Pub. L. No. 113-291, §§ 3202-3203 (2014).

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**PERSONNEL SUMMARY**

	<u>FY 2014 ACTUAL</u>	<u>FY 2015 FINANCIAL PLAN</u>	<u>FY 2016 BUDGET REQUEST</u>
Statutory Personnel Ceiling: (FTEs) <sup>1/</sup>	150	150	130
FTE Usage	107 <sup>2/</sup>	114	122.5
Board Members and Permanent Employees at End of Fiscal Year	105 <sup>2/</sup>	120	125

<sup>1/</sup> National Defense Authorization Act for FY 1992 and FY 1993, Pub. L. 102-190, raised the Board’s statutory employee ceiling from 100 to 150 full-time staff to accommodate mandated additional nuclear weapons oversight responsibilities. The Carl Levin and Howard P. ‘Buck’ McKeon National Defense Authorization Act for FY 2015, Pub. L. No. 113-291, lowered the employee ceiling from 150 to 130 full-time staff effective October 1, 2015. See Pub. L. 113-291, Sec. 3203 (to be codified at 42 U.S.C. § 2286b(b)(1)(A)). The ceiling includes five full-time Board Members appointed by the President, by and with the advice and consent of the Senate.

<sup>2/</sup> The President’s FY 2015 Budget assumed a FY 2014 FTE usage of 116 based on staffing to 120 employees by the end of the year, and a FY 2015 FTE usage of 125. The Board ended FY 2014 with 105 employees and operated at 107 FTEs, a decrease which will result in a delay in staffing to 125 employees. See page 11 for a more detailed explanation.

**Defense Nuclear Facilities Safety Board  
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**PROPOSED APPROPRIATIONS LANGUAGE**

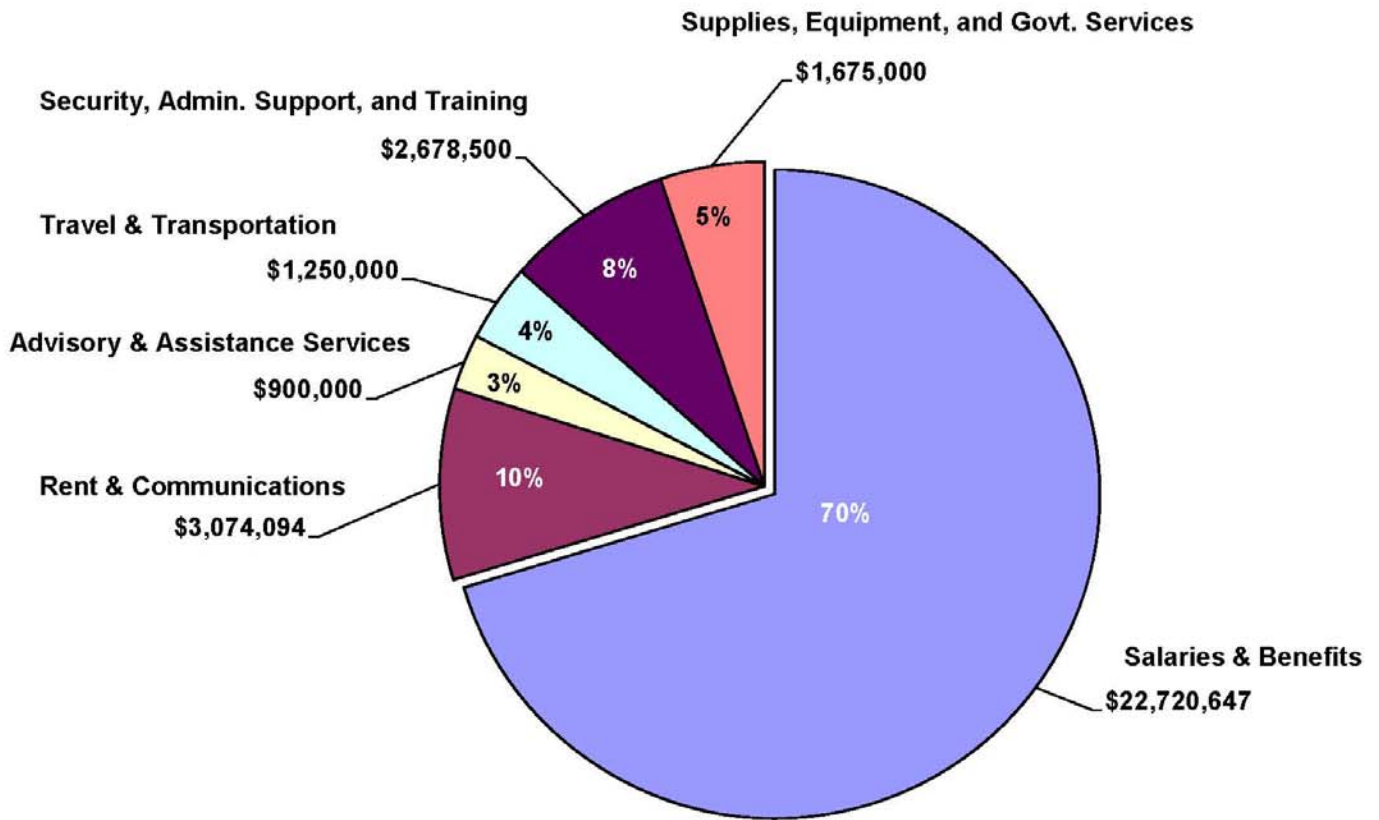
**SALARIES AND EXPENSES**

For necessary expenses of the Defense Nuclear Facilities Safety Board in carrying out activities authorized by the Atomic Energy Act of 1954, as amended by Public Law No. 100-456 (section 1441), *\$29,150,000* to remain available until September 30, 2017.

**Defense Nuclear Facilities Safety Board  
FY 2016 Congressional Budget Request**

**FY 2016 TOTAL PROJECTED OBLIGATIONS**

FY 2016 Total Projected Obligations = \$32,298,241



## 2. BUDGET REQUEST SUMMARY

The Board’s FY 2016 Budget Request for \$29,150,000 and 122.5 FTEs includes funding for statutory increases in civilian salaries and associated employee benefits (e.g., employer contributions to employee health benefit and retirement accounts) and increases in estimated rent costs, offset by a net reduction in unobligated balances available as a budgetary resource. A brief description of each requirement and associated funding request follows (a full explanation is included on the referenced page number):

	New Budget Authority	FTEs	Page Reference
Baseline – FY 2015 Enacted Appropriation	\$28,500,000	114	
<b>Funding for additional FTEs to address additional workload requirements under the Board’s statutory authority.</b> [Note: funding for 8.5 additional FTEs required for 122.5 FTEs, to reach staffing level of 125 included in FY 2015 President’s Budget].	\$1,760,000	8.5	11
<b>Funding for the assumed 1.3% civilian pay raise effective in January, 2016.</b> [Note: budget projection based on paying increased salaries and benefits for nine months in FY 2016 for a 1.3% Federal pay raise].	\$200,000		11
<b>Funding for increases in rental payments to the General Services Administration (GSA).</b> [Note: funding necessary for projected increases in rent costs upon expiration of the current GSA lease in March 2016].	\$535,000		12
<b>Less: Change in Unobligated Balances.</b> [Note: net reduction in unobligated balance available as a budgetary resource in lieu of required new budget authority].	(\$1,845,000)		12
<b>Total Additional Funding Requirements in FY 2016 Budget Request.</b>	\$650,000		
<b>FY 2016 New Budget Authority</b>	\$29,150,000	122.5	



### 3. EXECUTIVE SUMMARY

The Board is an independent agency within the executive branch (42 U.S.C. § 2286, *et seq.*) with a mission to provide independent analysis, advice, and recommendations to the Secretary of Energy to inform the Secretary, in his/her role as operator and regulator of DOE defense nuclear facilities, in providing adequate protection of public health and safety<sup>1</sup> at such defense nuclear facilities. To execute its oversight mission of ensuring adequate protection of public health and safety at DOE's defense nuclear facilities commensurate with the workload generated by DOE in FY 2016, the Board is requesting a total of \$29,150,000 in new budget authority and 122.5 FTEs.

The Fukushima Dai-ichi nuclear disaster and the Deepwater Horizon accident serve as sobering examples of the risks and hazards of what can result from ineffective government oversight. A nuclear accident at a DOE defense nuclear facility is unacceptable to the public, the Congress, and the Administration. The Board is the only government agency that provides independent scientific and technical safety oversight of DOE's defense nuclear facilities. The scope of the Board's mission will require a staffing level of 122.5 FTEs in FY 2016 due to a number of external factors:

1. The Board needs to continue its oversight of operations throughout the DOE defense nuclear complex to ensure operations are conducted safely. These operations include assembly and disassembly of nuclear weapons, fabrication of plutonium pits and weapon secondaries, production and recycling of tritium, criticality experiments, subcritical experiments, and a host of maintenance and other activities to address the radioactive legacy of more than 70 years of these operations. Continued effective oversight of the conduct of operations is the only way the Board may ascertain whether operations are being conducted with the appropriate formality, identify potential safety problems promptly, and advise the Secretary of Energy in order to ensure adequate protection of public and worker safety at DOE defense nuclear facilities. The February 2014 underground truck fire and radioactive release event at the Waste Isolation Pilot Plant (WIPP) dramatized that even activities that appear comparatively benign and well-controlled involve serious risks when radioactive materials are involved.

2. Many aging DOE facilities are unsound, and the transition to new facilities will take decades. For example, the Chemical and Metallurgy Research Facility at Los Alamos National Laboratory and the 9212 Complex at the Y-12 National Security Complex are of particular concern because of their deficient structures and advanced age. The Board will need to evaluate the rigor and maintenance of a robust safety posture in such facilities and inform the Secretary of potential threats to public health and safety.

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<sup>1</sup> The Board's 1991 Annual Report to Congress states the following: "The various provisions of the statute and their attendant legislative history indicate that Congress generally intended the phrase 'public health and safety' to be construed broadly. For example, both Congress and the Board have interpreted the public to include workers at defense nuclear facilities."

3. In addition to conducting nuclear safety oversight of hundreds of existing defense nuclear operations, the Board is obligated by law to conduct in-depth reviews of new defense nuclear facilities during design and construction to ensure the safety of the public and workers is addressed early in the design process. DOE has more than a dozen major design and construction projects currently underway or planned for the near future (see Exhibit A). The Board will continue to expend considerable resources to review the ongoing design effort as well as the construction activities at new DOE defense nuclear facilities, concentrating its oversight attention on the projects with high risk, significance, and complexity. For example, the \$12.3 billion Hanford Waste Treatment and Immobilization Plant (WTP) is a complex project that has changing design and construction parameters. The reviews conducted by the Board on WTP and other new DOE facilities are resource intensive and time consuming.

4. A 2013 DOE/Inspector General (IG) Audit Report (DOE-IG-0881, February 2013) entitled *National Nuclear Security Administration Contractor Governance*, reviewed the effectiveness of a 2007 National Nuclear Security Administration (NNSA) requirement for contractors to implement self-assessment systems to measure performance and ensure effective and efficient mission accomplishment. The Audit Report notes that despite five years of effort, NNSA and its support offices and site contractors had not yet implemented fully functional and effective contractor assurance systems. Specifically troubling was the recognition that contractor self-assessments were not effective in identifying safety weaknesses subsequently identified by independent reviews, and that federal site-level officials felt the contractor governance approach prohibited them from intervening in contractor activities. DOE continues to identify weaknesses in contractor assurance systems and federal oversight. In the last year, these weaknesses were identified by DOE as the root causes of (1) the fire and radiation contamination event at Waste Isolation Pilot Plant (WIPP) and (2) the suspension of operations at Los Alamos National Laboratory to address concerns with nuclear criticality safety and conduct of operations. The Board's independent oversight is essential in light of these weaknesses in contractor assurance systems and federal oversight.

5. DOE has developed actions responding to the Board's letter of August 28, 2012, that forwarded technical report DNFSB/TECH-37, *Integrated Safety Management at the Activity Level: Work Planning and Control*. Proper work planning and control are essential to ensure adequate safety controls are identified and implemented to protect workers during execution of hazardous nuclear activities. In response to DNFSB/TECH-37, DOE developed new guidance on work planning and control, including the new DOE Handbook 1211-2014, *Activity-Level Work Planning and Control Implementation*, and a revision to DOE Guide 226.1-2A, *Federal Line Management Oversight of Department of Energy Nuclear Facilities*. Proper use of the new DOE guidance for implementation and oversight of work planning and control should improve worker protection. The Board will continue to review work planning and control at DOE defense nuclear facilities to assess whether the needed improvements are achieved.

6. The Board issued Recommendation 2014-1, *Emergency Preparedness and Response*, on September 3, 2014. This recommendation identified problems with emergency preparedness and response of DOE sites with defense nuclear facilities and made recommendations on DOE actions to address weaknesses in its oversight capabilities and its directives. The Board will be reviewing DOE's development of its implementation plan responding to the Recommendation 2014-1 and monitoring actions taken as part of the implementation plan.

The Board's FY 2016 Budget Request supports the effort to increase the Board's staff to 125 FTEs to meet its scope of oversight responsibilities and to fulfill requirements of the IG Act, including supporting recommended operational improvements.<sup>2</sup> Because of the funding lapse in early FY 2014 and the subsequent delay in enactment of the appropriation (which delayed the Board's hiring efforts) and employee attrition, the Board's on-board strength at the end of FY 2014 was 105 personnel. Currently there are 110 encumbered Board positions, and the Board estimates it will realistically take until the end of FY 2016 to hire fifteen additional personnel (on top of replacing personnel who depart through normal attrition) to reach an on-board strength of 125 employees.

The DOE Defense Environmental Cleanup and NNSA Weapons Activities accounts, which included obligations of \$4.9 billion and \$8.3 billion, respectively, in DOE's FY 2015 budget request. The Board seeks to aid the Secretary in the early resolution of safety issues by providing project review letters and periodic reports on significant unresolved safety issues concerning the design and construction of DOE's defense nuclear facilities. Early resolution of safety issues minimizes the possibility of re-design and or re-engineering of a construction project to address the issues. Given the size of DOE's design and construction budget, the cost to DOE of a late-stage re-design or re-engineering for safety reasons could easily dwarf the Board's budget. The Board provides cost-effective oversight while protecting public and worker safety.

In line with congressional direction, the Board strives to proactively address DOE safety issues relating to public and worker safety. To do so, the Board needs the resources requested. The Board's requested FY 2016 budget of \$29,150,000 in new budget authority and 122.5 FTEs is necessary to address congressional concerns and provide the scientific and technical resources needed to review DOE's design and construction projects, remediation activities, and weapons programs in a timely and efficient manner.

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<sup>2</sup> The Consolidated Appropriations Act for FY 2014 assigned the IG of the Nuclear Regulatory Commission (NRC) to also serve as the Board's IG, and directly appropriated \$850,000 to the NRC Office of Inspector General (OIG) perform IG services for the Board. The Carl Levin and Howard P. 'Buck' McKeon National Defense Authorization Act for FY 2015 specifically amended the Board's statute to state that the NRC-OIG is the Board's IG, and the Consolidated and Further Appropriations Act for FY 2015 also directly appropriated \$850,000 to the NRC OIG to perform IG services for the Board.

#### 4. FY 2016 BUDGET REQUEST

<i>FY 2016 Request Summary</i>	<i>Permanent Positions</i>	<i>FTE</i>	<i>Amount (\$000)</i>
FY 2014 Actual	105	107	\$28,000
FY 2015 Budget Request	125	125	\$30,150
FY 2016 Budget Request	125	122.5	\$29,150
Total Change 2015-2016	0	(2.5)	(\$ 1,000)

##### **The Board's Mission**

The Board's mission is to provide independent analysis, advice, and recommendations to the Secretary of Energy to inform the Secretary, in his/her role as operator and regulator of DOE defense nuclear facilities, in providing adequate protection of public health and safety at such defense nuclear facilities.

Congress created the Board as an independent agency within the executive branch (42 U.S.C. § 2286, *et seq.*) to identify the nature and consequences of potential threats to public health and safety at DOE defense nuclear facilities, to elevate such issues to the highest levels of authority, and to inform the public. Since DOE is a self-regulating entity, the Board performs the only independent technical safety oversight of operations at DOE's defense nuclear facilities. Under its legislative mandate (Exhibit B), the Board plays a key role in maintaining the future viability of the Nation's nuclear deterrent capability by:

- Ensuring that the health and safety of the public and workers at DOE defense nuclear facilities are adequately protected, as DOE supports the readiness of the nuclear arsenal, dismantles surplus weapons, disposes of excess radioactive materials, cleans up surplus defense nuclear facilities, and constructs new defense nuclear facilities;
- Enhancing the safety and security of the Nation's most sensitive defense nuclear facilities when hazardous nuclear materials and components are placed in more secure and stable storage; and
- Providing for the early identification of health and safety vulnerabilities, and allowing the Secretary of Energy to address issues before they become major problems.

##### **The Challenge**

The Board uses its oversight authority to reduce the nuclear safety risks that exist in the defense nuclear complex to the greatest extent possible. DOE's safety performance has greatly improved since the establishment of the Board, yet the DOE nuclear weapons program remains a technically challenging and hazardous operation. Reductions in the pace and scope of the Board's oversight could allow the nuclear weapons complex to deteriorate again to the conditions that required the creation of the Board. Many tons of radioactive and toxic materials exist throughout the defense nuclear complex, either in storage or in use. There are multiple pathways by which these hazards might be released in the environment, creating risks to the

workers and the public. A large number of the complex's facilities were constructed decades ago and are deteriorating.

The Board oversees nuclear facilities at primarily 10 DOE sites. The Board stations Site Representatives at five of the sites, and maintains a cadre of technical staff at its Headquarters to perform oversight roles as required. During the next several years, the Board's safety focus at these sites will be on the following:

- **Pantex Plant in Texas.** Stewardship and maintenance of the nuclear weapons stockpile, including assembly and disassembly, surveillance, maintenance, and dismantlement of nuclear weapons and the storage of special nuclear material, particularly plutonium pits.
- **Oak Ridge National Laboratory (ORNL)/Y-12 National Security Complex (Y-12) in Tennessee.** Stewardship and maintenance of the nuclear weapons stockpile, including assembly and disassembly, evaluation, maintenance, and dismantlement of nuclear weapon components; fabrication of nuclear weapon components, including secondaries; processing of highly-enriched uranium; and storage of nuclear materials, including uranium from weapon components. This also includes design and construction of the Uranium Processing Facility.
- **Savannah River Site (SRS) in South Carolina.** Tritium operations, storage of special nuclear material, stabilization of high-level waste and residual nuclear materials from previous defense nuclear operations, and disposition of excess plutonium.
- **Los Alamos National Laboratory (LANL) in New Mexico.** Stockpile management and stewardship of the nuclear weapons stockpile, including research and enhanced surveillance of weapons, processing of nuclear materials, and pit production.
- **Lawrence Livermore National Laboratory (LLNL) in California.** Management and stewardship of the nuclear weapons stockpile, including research and enhanced surveillance of weapons, and processing of nuclear materials.
- **Nevada National Security Site (NNSS).** Stewardship of the nuclear weapons stockpile, including subcritical experiments and criticality experiments, packaging and disposal of radioactive waste, potential nuclear weapon assembly and disassembly operations, and potential operations with damaged nuclear weapons and improvised nuclear devices.
- **Sandia National Laboratories (SNL) in New Mexico and California.** Management and stewardship of the nuclear weapons stockpile, including research, enhanced surveillance of weapon components, operation of the Annular Core Research Reactor, and packaging of radioactive wastes.
- **Hanford Site in Washington.** Storage and stabilization of high-level waste, stabilization of residual sludge from corroded spent nuclear fuel, stabilization of other residual nuclear material from previous operations, and dismantling and disposition of excess defense nuclear facilities. This also includes design and construction of the Waste Treatment and

Immobilization Plant as well as the supporting infrastructure in the Hanford Tank Farms necessary to feed high-level waste to the plant when operational.

- **Idaho National Laboratory (INL) in Idaho.** Storage and stabilization of high-level waste, storage of spent nuclear fuel, packaging and disposition of radioactive waste, and dismantling and disposition of excess defense nuclear facilities.
- **Waste Isolation Pilot Plant (WIPP) in New Mexico.** Receipt, handling, and permanent deep geological disposal of transuranic wastes.

### **The Risks**

The potential for release of hazardous materials to the environment at DOE defense nuclear facilities continues to pose safety and health risks to the public and the workers. Many current facilities are old and deteriorating and contain significant amounts of hazardous materials, especially nuclear waste. These current facilities require careful oversight as operations continue or as they undergo decommissioning and cleanup. New facilities being built to replace current ones or to process, stabilize, and dispose of legacy nuclear waste in turn create their own new waste streams and require extensive planning to mitigate risks of environmental release. Safety systems in both new and old facilities must be designed to prevent the release of hazardous materials. These systems, moreover, must function during and after earthquakes, extreme winds, floods, lightning, wildland fires, and other such natural phenomena. Natural phenomena hazards can simultaneously affect multiple facilities on a site, greatly complicating emergency preparedness, response, and recovery.

In addition to natural phenomena, hazardous nuclear materials may be released because of inadequate safety controls, human error, equipment malfunctions, chemical reactions, fire, detonation of explosives, and inadvertent nuclear criticality events. Many DOE facilities continue to contain sufficient amounts of fissionable material such that the risk of an accidental nuclear criticality exists and must be controlled. Chemical reactions in materials used in defense nuclear work need to be carefully monitored. As the massive DOE nuclear waste cleanup effort continues, the use of leading edge technologies in new facilities can create additional nuclear safety risks due to the lack of experience in designing, constructing, operating, and maintaining these facilities. DOE's nuclear weapons stockpile stewardship and management operations are unique in that they include nuclear activities and experiments involving collocated high explosives and nuclear material. The risks at these defense nuclear facilities are not solely a function of the quantities of nuclear material present, but, more importantly, the potential for explosive dispersal of radioactive materials or inadvertent nuclear detonation.

### **Strategic Goals**

In FY 2014, the Board published an updated Strategic Plan for FY 2014 through FY 2018. Technical safety oversight is the number one priority for the Board, and encompasses activities as outlined in the Board's enabling legislation and other congressional direction included in authorization and/or appropriations legislation. As will be discussed in more detail

later in this budget request, the Board focuses its technical safety oversight through three interdependent strategic goals:

Strategic Goal # 1: Improve Safety of Operations

Strategic Goal # 2: Strengthen Safety Standards

Strategic Goal # 3: Strengthen Safety in Design

In order to properly support and manage its technical safety oversight mission, the Board has identified a fourth goal that supports the other strategic goals.

Strategic Goal # 4: Achieve Excellence in Management and Communication with Stakeholders. Under this goal, the Board is completely revamping and modernizing its internal controls and work processes to maximize the effectiveness, efficiency, and accountability of its operations.

### **Human Capital-The Board's Greatest Asset**

Seventy percent of the Board's Budget Request is dedicated to salaries and benefits for its staff and Board Members. The Board must function as an oversight organization comprising leading technical experts who quickly recognize problems in the hundreds of hazardous operations conducted daily throughout the DOE defense nuclear complex. The Board relies on a focused and well-executed human capital program that uses all available tools to attract and retain the technical talent necessary to accomplish the Board's congressionally mandated mission. The Board has determined that its technical staff requires scientists and engineers with extensive backgrounds in technical disciplines, such as nuclear-chemical processing, conduct of operations, facility safety analysis, conventional and nuclear explosive technology and safety, nuclear weapons safety, storage of nuclear materials, nuclear criticality safety, and waste management. Virtually all technical staff personnel have technical master's degrees; almost all technical personnel who do not are actively pursuing graduate degrees. Approximately 19 percent of the technical staff members have doctoral degrees. Because the Board's health and safety recommendations and other advisories to the Secretary of Energy are based on in-depth technical information and detailed safety analyses, recruitment and retention of scientific and technical staff members with outstanding qualifications continue to be critical to the successful accomplishment of the Board's mission.

The technical staff comprises approximately 75 percent of the Board's budgeted total workforce, with the remainder comprised of administrative and legal staff. Between FY 2007 and FY 2014, the technical staff increased by 24 people at its peak. During this same period, administrative support and legal staff positions remained constant. The obligations attributable to the technical staff, which amount to approximately 80 percent of the Board's budget, are comprised of salaries, benefits, travel, training, and technical expert contractors who provide technical expertise in specialty areas, as well as a portion of the operating costs (e.g., rent and building security).

The combination of an aging workforce and high demand for experienced scientists and engineers by other organizations remains a challenge for the Board. Approximately 19 percent of the Board's technical staff is eligible for regular retirement today. Competition for scientists and engineers with the Board's required expertise continues to be stiff due to the demands of the commercial nuclear power industry, the consequent need for increased technical expertise by the NRC, the Department of Defense's emphasis on combating weapons of mass destruction, and DOE's nuclear weapons complex activities. Consequently, the Board expects to continue devoting resources as necessary toward recruiting highly qualified technical personnel in a competitive job market.

In addition to maintaining an experienced scientific and engineering staff, as well as filling vacancies as they occur, the Board will continue to focus on attracting the next generation of scientists and engineers. The Board will continue its highly competitive three-year Professional Development Program, which brings entry-level technical talent into professional positions within the Board straight from college. Through a technical mentor, individuals are provided a series of individually tailored developmental assignments, formal academic schooling, and a one-year, hands-on field assignment. The Professional Development Program employees have a three-year service commitment to the Board. The Board plans to recruit three additional people into the program in FY 2016.

### **Health and Safety Oversight Resource Requirements**

In order to maintain an effective, independent oversight program over a vast array of DOE defense nuclear programs and projects in geographically dispersed locations, the Board must continually balance and redirect its health and safety oversight resources with careful consideration of the following factors:

- Nuclear safety oversight activities are prioritized on the bases of risks to the public and the workers, the types and quantities of nuclear and hazardous material at risk, and the process and setting of the operations involved.
- Identifying potential accident conditions and mitigating their consequences are very important for risk management. Safety is assured by working to understand and reduce the likelihood of events that adversely affect safety and by limiting the consequences of events if they do occur, i.e., prevention and mitigation. In addition, safety is assured through robust systems that employ defense-in-depth, i.e., using multiple layers of protection such that no single layer is depended upon to ensure safety. The Board is actively working to identify "leading indicators" that can be used to prevent accidents.
- "Safety-in-design" requires integration of safety considerations early in the design and construction process of DOE defense nuclear facilities. The result of DOE adhering to this concept should be decreased project costs associated with retrofitting or redesigning safety systems into facilities as they are constructed, coupled with increased operating efficiency achieved by avoiding unplanned shutdowns to address latent safety issues.



- Equally important to safety-in-design is ensuring that facility safety systems will meet the functional design requirements through careful oversight of the quality assurance practices and testing programs as the facilities are built and placed into operation. Evaluating the transition of a facility from construction to operation requires additional oversight during the startup process and into operation.
- Another key facet to a facility's nuclear safety posture is the proper development of Technical Safety Requirements during the design and construction phase. Typically, Technical Safety Requirements are only preliminary when construction commences; as the facility approaches operation, these key safety provisions are fully developed and implemented in the facility's safety basis, which is basically a license to operate a facility per the requirements of 10 C.F.R. Part 830 - DOE's *Nuclear Safety Management Rule*. Technical Safety Requirements must be conservatively determined based on a thorough understanding of the safety features in the design and properly implemented during the transition to facility operation; otherwise, the facility will not achieve the required level of safety in operation.

In preparing this Budget Request, the Board reviewed its current resources and capabilities against the projected workload depicted in the FY 2015 Budget Request, which was derived from three sources: congressional direction, current DOE programs and projects, and new DOE projects and programs. The Board has also reviewed the President's priorities regarding nuclear weapons for applicability to the Board.

### **Prioritization of Work**

The Board's safety oversight activities are prioritized predominantly on the basis of risk to the public and the workers, types and quantities of nuclear and hazardous material at hand, and hazards of the operations involved. Four types of oversight are underway at all times.

- Evaluation of DOE's organizational policies and processes. These reviews evaluate topics such as technical competence of DOE and contractor personnel, adequacy of safety requirements and guidance, and the presence of a strong safety culture.
- Evaluation of actual hazardous activities and facilities in the field. These reviews focus on identifying the hazards and evaluating controls put in place to mitigate those hazards. The Board prioritizes these reviews based on the risk, complexity, maturity, and significance of the activities underway or planned by DOE.
- Expert-level reviews of the safety implications of DOE's actions, decisions, and analyses.
- Identification of new safety issues otherwise unknown in the DOE complex. Since, by definition, these safety issues would not have been addressed but for the Board's efforts, this may be the area in which the Board has the largest impact on the safety of DOE's highly hazardous operations. Examples of new safety issues identified by the Board during FY 2014 include: (1) the need for safety-class controls to prevent

unacceptable consequences from a wildland fire that impacts the Transuranic Waste Facility currently under design at Los Alamos National Laboratory, as detailed in a Board letter to DOE dated August 7, 2014; (2) the vulnerability of all the safety-significant safety instrumented systems in the 242-A High-Level Waste Evaporator at the Hanford Site to suffer a common-cause failure in a fire, as detailed in a Board letter to DOE dated June 18, 2014; and (3) numerous deficiencies in the conduct of operations and maintenance programs at the defense nuclear facilities at Sandia National Laboratories, which the NNSA field office and the laboratories' self-assessment program failed to detect, as detailed in a Board letter to DOE dated May 12, 2014.

The Board uses its Strategic Plan and its Annual Performance Plan to ensure that its resources remain focused on the most significant safety challenges. This approach gives the Board confidence that its staff and budget are dedicated to the highest risk activities under the Board's jurisdiction.

### **Congressional Concerns about Facilities and DOE Operations**

Congress has continued to express its concern, both during hearings and in legislation, with DOE's ability to manage its nuclear programs, especially the design and construction of new defense nuclear facilities. With its well-recognized technical expertise and cost-effective methods for conducting nuclear health and safety oversight, the Board's operations assist DOE in meeting mission requirements because safety and mission execution are closely coupled.

### **Increased Activity at DOE Defense Nuclear Facilities**

The risks and challenges facing DOE continue to grow. DOE is pursuing numerous major design and construction projects to build defense nuclear facilities for programmatic work and cleanup activities (Exhibit A), about a dozen of which are of particular concern to the Board. The Board is required by law to review DOE's design and construction projects to ensure that adequate protection of the health and safety of the public is addressed before construction begins and periodically thereafter. In FY 2016, the Board will be required to expend considerable resources to review ongoing design efforts, as well as construction and startup activities.

### **Review of DOE Directives**

Members of the Board's staff review newly proposed DOE directives and revisions to directives of interest to the Board including DOE technical standards and NNSA supplemental directives. The staff must evaluate new directives and proposed changes to existing directives to ensure requirements and guidance that affect safety will continue to provide adequate protection of the public, workers, and environment. Members of the Board's staff closely evaluate any reduction of requirements and guidance that affects safety to ensure the reduction will not compromise safety. Once DOE approves new or revised directives, the staff assesses the implementation of these DOE directives in the field to ensure requirements and guidance are implemented effectively. Historically, the staff has reviewed approximately 35 directives per year.

In FY 2014, DOE published a new DOE Standard, *Development of Probabilistic Risk Assessments for Nuclear Safety Applications*. DOE has identified the Hanford WTP as a pilot application for this standard. However, DOE's initial review of the pilot application found a number of shortcomings in the effort. As a result, DOE directed the WTP contractor to revise its approach to comply with the requirements and guidance of the new standard. Ultimately, the Board expects to review the probabilistic risk assessments for various WTP applications as well as any other uses of probabilistic risk assessment that emerge.

### **Additional Staffing Requirements**

The President's FY 2015 Budget of \$30,150,000 included funding for 125 FTEs for the Board to execute its oversight mission of ensuring adequate protection of public health and safety at DOE's defense nuclear facilities, and to fulfill requirements of the IG Act, including supporting recommended operational improvements. The Budget assumed a FY 2014 FTE usage of 116 based on increasing staffing from 111 to 120 employees by year-end, and a FY 2015 usage of 125. Because of the funding lapse in early FY 2014 and the subsequent delay in enactment of the appropriation (which delayed the Board's hiring efforts), and an abnormally high level of attrition, the Board ended FY 2014 with 105 employees, a net loss of six. The Board currently has 110 employees, and estimates it will realistically take until the end of FY 2016 to hire fifteen additional personnel (on top of replacing personnel who depart through normal attrition) to reach an on-board strength of 125 employees. The Board's interim goal is to have 120 employees on board by the end of FY 2015 (which would result in a FY 2015 FTE usage of approximately 114), and then reach its goal of 125 employees on board by the end of FY 2016, resulting in a FY 2016 FTE count of 122.5.

The FY 2015 enacted appropriation of \$28,500,000 will allow the Board to operate at the planned 114 FTEs. Thus, for FY 2016 the Board requires additional funding for 8.5 FTEs to operate at 122.5 FTE.

### **Additional Funding Needs**

Actual obligations for FY 2014, the financial plan for FY 2015, and the Board's Budget Request for FY 2016 are presented by object class (OC) accounts in Exhibit C.

- **Fully Fund the Salaries and Benefits Account for FY 2016 (OC 10)**

In addition to \$1,760,000 in funding needed for the increased 8.5 FTEs required (these additional FTEs are estimated to require approximately \$207,000 on average in obligations including salaries, benefits, and other miscellaneous expenses), the Board's Budget Request includes additional funding of \$200,000 to pay for increased salary and personnel benefits costs to fund the President's proposed FY 2016 civilian pay raise of 1.3 percent, as well as a projected increase in the agency's contribution percentage toward employee FERS retirement.

- **Funding for Increased Rental Payments to GSA (OC 23.1)**

The current GSA lease for the Board's office space in Washington, DC (where it has been located since 1990), will expire on March 6, 2016. Based on current market conditions, GSA has budgeted \$50/rentable square foot for a new lease, a 42 percent increase over the \$35.15 the Board will be paying in FY 2016 under its current occupancy agreement. For FY 2016, the total rent request is \$2,793,094 based on five months at the current lease and seven months at the estimated new lease rate, an increase of \$535,000 from the FY 2015 estimated rental payment to GSA.

- **Funding Offset from a Change in Unobligated Balances**

The Board ended FY 2014 with an unobligated balance of \$5.707M. This is a higher balance than it has historically experienced due to operating at less than the planned FTE, and de-obligation of approximately \$1.9M in funds from closing aged obligations (e.g., completed contracts). As shown in Exhibit C, the Board plans to draw down the unobligated balance to \$4.854M in by the end of FY 2015, and \$1.931M in FY 2016. That difference (\$2.923M) less the reduction in the beginning unobligated balance and recover of prior year obligations between FY 2015 and FY 2016 (\$1.078M) can be used as a FY 2016 budgetary resource in lieu of additional new budget authority.

## **Conclusion**

The Board's mandate is to provide vital, independent, technical health and safety oversight of DOE's defense nuclear facilities and activities in order to protect the health and safety of the public and workers. To accomplish this mission in FY 2016, the Board is requesting a total of \$29,150,000 in new budget authority and 122.5 FTEs. The Board provides oversight to DOE programs in the Office of Environmental Management and NNSA.

The Board seeks to avoid costly post-construction modifications to complex DOE defense nuclear facilities, due to the late identification of significant design flaws that could impact public and worker health and safety. Such modifications would require significantly more resources than the Board's budget. In this regard, the Board's requested funding is an inexpensive insurance policy to address Presidential and congressional priorities. But even more importantly, the Board works with DOE to prevent a nuclear accident that would be catastrophic to public and worker safety and adversely impact DOE's national security mission.

The Board's Budget Request of \$29,150,000 in new budget authority and 122.5 FTEs is necessary to provide the scientific and technical resources required to oversee the safety of the DOE cleanup program and the modernization of the weapons complex.

The Fukushima Dai-ichi and Deepwater Horizon accidents yielded an important lesson learned: inadequate independent oversight in a hazardous industry carries significant risks for the public, the workers, and the environment. In the case of DOE's defense nuclear complex, the potential hazards could clearly dwarf the impacts of the oil rig disaster. A major accident at a DOE defense nuclear facility would have intolerable safety, programmatic, and economic impacts that could rival those of the accident at Japan's Fukushima Dai-ichi nuclear station, and have significant adverse consequences on DOE's national security mission.

**Exhibit A: Planned or Underway DOE Design/Construction Projects**

SITE	FACILITY	TOTAL PROJECT COST (\$M)	CRITICAL DECISION APPROVED
<b>Hanford Site</b>	<b>Waste Treatment and Immobilization Plant</b>	12,263	
	Pretreatment Facility		CD-3
	High-Level Waste Facility		CD-3
	Low-Activity Waste Facility		CD-3
	Analytical Laboratory Facility		CD-3
	Balance of Facilities		CD-3
	<b>K-Basin Closure Sludge Treatment Project</b>	308	Phase 1: CD-3 Phase 2: CD-0
	<b>Low Activity Waste Pretreatment System</b>	375	CD-0
<b>Idaho National Laboratory</b>	<b>Integrated Waste Treatment Unit (IWTU)</b>	570.9	CD-4
	<b>Calcine Disposition Project</b>	900-2,000	CD-0
<b>Los Alamos National Laboratory</b>	<b>Plutonium Facility (PF-4) Seismic Upgrades</b>	Building structure: 15-20 Fire suppression system: 6  Active confinement ventilation system: 60-145	Not formally implementing critical decision process

SITE	FACILITY	TOTAL PROJECT COST (\$M)	CRITICAL DECISION APPROVED
	<b>Chemistry and Metallurgy Research Replacement Project – Radiological Laboratory Utility Office Building Equipment Installation Phase 2 and Plutonium Facility Equipment Installation</b>	1,500-2,000	CD-1
	<b>Radioactive Liquid Waste Treatment Facility Upgrade Project—Transuranic Liquid Waste Facility</b>	62-96	CD-1
	<b>Transuranic Waste Facility Project</b>	106.9	Phase A: CD-4 Phase B: CD-3
<b>Oak Ridge National Laboratory</b>	<b>Transuranic Waste Processing Center Sludge Project</b>	127-171	CD-1
<b>Savannah River Site</b>	<b>Saltstone Disposal Unit #6</b>	143	CD-3
	<b>Salt Waste Processing Facility</b>	2,320	CD-3
	<b>Waste Solidification Building</b>	414.1	CD-2/3
<b>Waste Isolation Pilot Plant</b>	<b>Underground Ventilation System</b>	309	CD-0
<b>Y-12 National Security Complex</b>	<b>Uranium Processing Facility</b>	4,200-6,500	CD-1
	<b>Metal Purification Process</b>	Not available	Electrorefining: CD-0

## **Exhibit B: The Board's Legislative Mandate**

The Board's specific functions are delineated in its enabling statute, 42 U.S.C. § 2286a(b), which states:

- The Board shall review and evaluate the content and implementation of the standards relating to the design, construction, operation, and decommissioning of defense nuclear facilities of the Department of Energy (including all applicable Department of Energy orders, regulations, and requirements) at each Department of Energy defense nuclear facility. The Board shall recommend to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected. The Board shall include in its recommendations necessary changes in the content and implementation of such standards, as well as matters on which additional data or additional research is needed.
- The Board shall investigate any event or practice at a Department of Energy defense nuclear facility which the Board determines has adversely affected, or may adversely affect, public health and safety.
- The Board shall have access to and may systematically analyze design and operational data, including safety analysis reports, from any Department of Energy defense nuclear facility.
- The Board shall review the design of a new Department of Energy defense nuclear facility before construction of such facility begins and shall recommend to the Secretary, within a reasonable time, such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety. During the construction of any such facility, the Board shall periodically review and monitor the construction and shall submit to the Secretary, within a reasonable time, such recommendations relating to the construction of that facility as the Board considers necessary to ensure adequate protection of public health and safety. An action of the Board, or a failure to act, under this paragraph may not delay or prevent the Secretary of Energy from carrying out the construction of such a facility.
- The Board shall make such recommendations to the Secretary of Energy with respect to Department of Energy defense nuclear facilities, including operations of such facilities, standards, and research needs, as the Board determines are necessary to ensure adequate protection of public health and safety. In making its recommendations, the Board shall consider, and specifically assess risk (whenever sufficient data exists), the technical and economic feasibility of implementing the recommended measures.



**EXHIBIT C: OBLIGATIONS BY FISCAL YEAR**

BUDGET ACCOUNT -- (OC)	FY 2014 OBLIGATIONS (Actual)	FY 2015 FINANCIAL PLAN	FY 2016 BUDGET REQUEST
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PERSONNEL SALARIES -- (11)	\$14,112,174	\$15,500,639	\$17,057,957
PERSONNEL BENEFITS -- (12)	\$ 4,431,090	\$ 5,119,295	\$ 5,662,690
BENEFITS FOR FOMER PERSONNEL -- (13)	\$ 359	\$ 0	\$ 0
TRAVEL -- (21)	\$ 641,250	\$ 900,000	\$ 1,100,000
TRANSPORTATION OF THINGS -- (22)	\$ 76,474	\$ 110,000	\$ 150,000
RENTAL PAYMENTS TO GSA -- (23.1)	\$ 2,452,306	\$ 2,258,809	\$ 2,793,094
COMMUNICATIONS & UTILITIES (23.3)	\$ 269,666	\$ 281,700	\$ 281,000
PRINTING & REPRODUCTION -- (24)	\$ 29,448	\$ 49,000	\$ 48,500
ADVISORY & ASSISTANCE SERVICES -- (25.1)	\$ 544,636	\$ 1,000,000	\$ 900,000
OTHER SERVICES -- (25.2)	\$ 2,546,363	\$ 2,553,000	\$ 2,500,000
GOVERNMENT SERVICES -- (25.3)	\$ 1,027,444	\$ 950,000	\$ 875,000
OPERATION & MAINT. OF FACILITIES -- (25.4)	\$ 12,388	\$ 30,000	\$ 30,000
OPERATION & MAINT. OF EQUIPMENT -- (25.7)	\$ 65,087	\$ 100,000	\$ 100,000
SUPPLIES & MATERIALS -- (26)	\$ 204,217	\$ 275,000	\$ 300,000
ACQUISITION OF ASSETS -- (31)	\$ 396,730	\$ 675,000	\$ 500,000
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*** TOTAL OBLIGATIONS ***	\$26,809,632	\$29,802,443	\$32,298,241
NEW BUDGET AUTHORITY	\$28,000,000	\$28,500,000	\$29,150,000
UNOBLIGATED BALANCE - PREV. FY	\$ 4,051,254	\$ 5,707,071	\$ 4,854,628
RECOVERY OF PRIOR YR OBLIGATIONS	\$ 465,449	\$ 450,000	\$ 225,000
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TOTAL BUDGETARY RESOURCES	\$32,516,703	\$34,657,071	\$34,229,628
EST. UNOBLIGATED BAL. - CUR. FY	\$ 5,707,071	\$ 4,854,628	\$ 1,931,387
OUTLAYS	\$25,430,698	\$29,206,394	\$30,360,347

## EXHIBIT C SUMMARY

The following provides further detail supporting the FY 2016 amounts in Exhibit C, i.e., describing further how the Board proposes to utilize the budget resources requested in the following manner:

### **Salaries and Benefits (OC 10)**

The FY 2016 request includes funding of \$22,720,647 to support the projected salary and benefit costs for 122.5 FTEs. The funding for salaries and benefits represents 70 percent of the Board's FY 2016 estimated obligations. In calculating the projected salary and benefits needs of the Board, the following federal pay adjustment and benefits factors for Executive Branch employees are used:

- Pay increase of 1.0 percent beginning in January 2015.
- Pay increase of 1.3 percent beginning in January 2016.
- Employee benefits of 30.2 percent of salaries, or \$39,999 per FTE in FY 2016.

Note personnel benefit (OC 12) costs also include other costs (e.g., change of station, public transit subsidies).

In establishing the Board, Congress sought to bring the best talent available to focus on health and safety oversight questions associated with the design, construction, operation, and decommissioning of DOE defense nuclear facilities. The recruitment and retention of scientific and technical staff with outstanding qualifications are the key components in the Board's human capital strategy if the Board is to be successful in accomplishing its mission. The Board has assembled a small and highly talented technical staff with extensive backgrounds in science and engineering disciplines, such as nuclear-chemical processing, conduct of operations, general nuclear safety analysis, conventional and nuclear explosive technology and safety, nuclear weapon safety, storage of nuclear materials and nuclear criticality safety, and waste management. Virtually all of the technical staff has technical master's degrees, and approximately 19 percent hold doctoral degrees. Many of the Board's technical staff members possess practical nuclear experience gained from duty in the U.S. Navy's nuclear propulsion program, the nuclear weapons field, or the civilian reactor industry. In order to accomplish the Board's highly technical mission, it is of paramount importance that the Board receives sufficient funds to meet the salary and benefit requirements of the staff.

The Board enhances its on-site safety oversight of defense nuclear facilities by assigning experienced technical staff members to full-time duty at priority DOE sites. Currently ten full-time site representatives are stationed at five DOE sites: 1) Pantex Plant to oversee nuclear weapons activities, including the weapons stockpile stewardship and weapons disassembly programs; 2) Hanford Site to monitor waste characterization and stabilization and facility deactivation; 3) Savannah River Site to monitor DOE's efforts to deactivate facilities, stabilize waste materials, and store and process tritium; 4) Oak Ridge's Y-12 National Security Complex to monitor safety and health conditions at Y-12 and other defense nuclear facilities in the area; and 5) Los Alamos National Laboratory (LANL) to advise the Board on overall safety and health conditions at LANL, and to participate in Board reviews and evaluations related to the design, construction, operation, and decommissioning of LANL defense nuclear facilities.

The Site Representatives Program provides a cost-effective means for the Board to closely monitor DOE activities, and to identify health and safety concerns promptly by having on-site staff conducting first hand assessments of nuclear safety management at the priority sites to which they have been assigned. Site representatives regularly interact with the public, union members, congressional staff members, and public officials from federal, state, and local agencies.

### **Travel (OC 21)**

The Board requests \$1,100,000 to support the official travel of Board Members and staff, \$50,000 less than the amount requested in President's FY 2015 Budget to adjust for 2.5 fewer FTEs. Extensive travel to the various DOE defense nuclear facilities located throughout the United States is necessary for Board Members and staff to conduct first-hand assessments of operations and associated health and safety issues. The Board is required to react to incidents at DOE defense nuclear facilities that may affect public health and safety, requiring unplanned travel expenditures to support its work at these sites. During FY 2014, Board Members and staff made 137 team visits to defense nuclear sites in support of its high priority public health and safety oversight mission.

The Board is also authorized to station staff members at DOE sites or facilities to assist in carrying out its functions. The Board has assigned technical staff teams to round-the-clock monitoring of major startup, testing, or restart activities at various DOE sites. The presence of its technical staff has proved to be invaluable in providing the Board with firsthand information on the demonstrated readiness, capabilities, and performance of DOE and its contractors for ensuring safety in the conduct of such activities. During the coming fiscal years, the Board anticipates a continued need for technical staff teams to monitor construction and startup of new DOE defense nuclear facilities, such as the Salt Waste Processing Facility in Aiken, South Carolina; the WTP in Richland, Washington; and the Uranium Processing Facility in Oak Ridge, Tennessee.

Travel funds are also used to pay for Board expenses associated with public hearings and meetings at or near DOE sites, where any interested persons or groups may present comments, technical information, or data concerning health and safety issues under the Board's purview.

### **Transportation of Things (OC 22)**

The Board has included \$150,000 in its FY 2016 Budget Request - the same amount included in the President's FY 2015 Budget - for the shipment of household goods for employees relocating to the Washington, DC, area and/or to become site representatives at DOE facilities.

### **Rental Payments to GSA (OC 23.1)**

The Board requests funds totaling \$2,793,094 to reimburse GSA for projected office rental costs. This amount is \$575,166 greater than the amount included in the President's FY 2015 Budget, and approximately \$535,000 higher than the Board's current FY 2015 rent estimate, due to expiration of the Board's current lease, as explained on page 11. This overhead expense represents approximately 8.7 percent of the Board's FY 2016 Budget Request.

### **Communications and Utilities (OC 23.3)**

The Budget Request includes \$281,000 for projected communications support costs. Funds in this account will be used for telephone (local, long distance, and cellular) services, Internet emergency communications services for the Board's Headquarters, Site Representatives, and the Board's alternate Continuity of Operations Facility are also included in this account.

### **Printing and Reproduction (OC 24)**

The Budget Request includes \$48,500 for reimbursing the U.S. Government Printing Office for publication of required legal notices in the *Federal Register*. Routine printing and copying charges for Budget Requests, the Board's *Annual Report to Congress*, and technical reports, are also included in this account.

### **Advisory and Assistance Services (OC 25.1)**

The Board maintains a highly skilled staff, but it is not economically feasible to maintain multiple permanent staff in very specialized technical disciplines. Therefore, it is necessary to have the funds available to immediately contract for this expertise when needed. Advisory and assistance services obligations include training costs for the Board's engineers and scientists as well as contracting costs for outside experts. For example, extensive use of technical consultants has been necessary to review the complex design and construction of the Waste Treatment and Immobilization Plant at Hanford. This includes the review of seismic analysis, structural loading, and construction plans to ensure the safety of this more than \$12 billion project. The Board obtains specialized contractor expertise in a variety of technical disciplines to augment its internal review capability and avoid any unnecessary impact on DOE's construction schedule.

The Board plans to continue contracting for technical expert services in highly specialized disciplines such as geotechnical investigation and seismic/structural engineering. Should an unexpected imminent or severe threat to public health and safety be identified, this expertise may be required for short durations. Each technical expert that the Board employs will continue to be carefully screened for possible conflict of interest.

The FY 2016 Budget Request includes \$900,000 for both training of Board engineers and scientists and for advisory and assistance support contracts to assist the Board in its health and safety reviews, the same amount included in the President's FY 2015 Budget.

### **Other Services (OC 25.2)**

The Budget Request includes \$2,500,000 to fund a wide range of recurring information technology and administrative support needs of the Board in FY 2016 in such areas as help desk, server administration, physical and cyber security, training for administrative and legal employees, recruitment, court reporting, and drug-free workplace testing. This amount is the same as requested in the President's FY 2015 Budget.

### **Government Services (OC 25.3)**

The Board's budget request includes \$875,000 for reimbursable support agreements with other Federal agencies, the same amount as included in the President's FY 2015 Budget. The Board utilizes cross-service providers for accounting and payroll processing services consistent with government-wide lines of business objectives, and also utilizes cross-servicing arrangements for services such as physical security, health unit, employee background investigations for security clearances, Employee Assistance Program services, and the Library of Congress FedLink program for legal and legislative research.

### **Operation and Maintenance of Facilities (OC 25.4)**

The Board requests \$30,000 for maintaining Board facilities (e.g., HVAC maintenance, building alterations and plumbing repairs outside the scope of the building lease) - the same amount included in the President's FY 2015 Budget.

### **Operation and Maintenance of Equipment (OC 25.7)**

The Board requests \$100,000 for maintaining and repairing Board equipment (e.g., copier maintenance agreements, repair of office equipment), and for storage of household goods for relocated personnel, the same amount included in the President's FY 2015 Budget.

### **Supplies and Materials (OC 26)**

The Board requests \$300,000 for continued access to numerous technical standards databases, legal research services, maintenance of the technical reference information for its library, and for general office supplies and materials, the same amount included in the President's FY 2015 Budget.

### **Acquisition of Assets (OC 31)**

The Board requests \$500,000 acquisition of assets, the same amount included in the President's FY 2015 Budget. This includes \$450,000 for recurring software licenses/maintenance agreements supporting the Board's operations, to replace outdated office equipment such as printers and copiers, and to make minor enhancements to existing software systems. In addition, the Board requests \$50,000 in non-recurring obligations for anticipated mandatory IT initiatives.

The Board's Budget Request for assets does not otherwise include funding for any new systems. It does include a small amount (less than \$100,000) for potential enhancements to existing systems. The priority for system enhancements will be to ensure that existing security requirements are maintained and/or addressed as part of the enhancement (e.g., no funds will be spent on systems enhancement without first ensuring systems meet existing security requirements or will meet them as a result of the enhancement).

## 5. ANNUAL PERFORMANCE PLAN

### Agency and Mission Information

**Overview.** The Board's FY 2016 Annual Performance Plan (APP) and Annual Performance Report (APR) are included here as an integral part of the FY 2016 Budget Request to Congress. Introductory material regarding the Board, its legislative authority, mission, staffing, and budget may be found in sections 1–4 of the Budget Request.

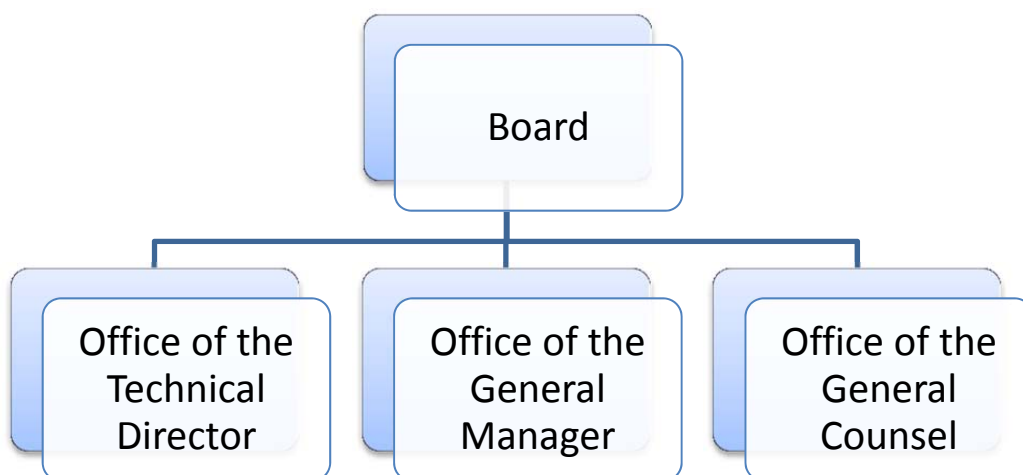
The Board's FY 2016 APP aligns with the Board's *Defense Nuclear Facilities Safety Board Strategic Plan, FY 2014–2018*, summarized below. The Board developed new Performance Goals in FY 2014 that align with the agency's Strategic Goals and Objectives.

The FY 2014 accomplishments shown in the APR are the first to align with the Performance Goals published in the Strategic Plan. Performance accomplishments for FY 2013 and the previous two years are included in the format used in those years, i.e., aligned with the annual Performance Objectives established in those years.

**Mission Statement.** Per the Board's enabling legislation (42 U.S.C. § 2286a(a)), the mission of the Board is:

to provide independent analysis, advice, and recommendations to the Secretary of Energy to inform the Secretary, in the role of the Secretary as operator and regulator of the defense nuclear facilities of the Department of Energy, in providing adequate protection of public health and safety at such defense nuclear facilities.

**Organizational Structure.** The Board is composed of 122.5 budgeted Federal FTEs arranged in a relatively flat management structure. More than 80 FTEs are assigned to the Office of the Technical Director (OTD), where they directly carry out the mission of the Board, supported by the Office of the General Manager (OGM) and the Office of the General Counsel (OGC).



## Strategic Goals and Strategic Objectives

Based on the mission noted above, the Board proposed the following Strategic Goals and Strategic Objectives. These Goals and Objectives are also repeated in the section of this report entitled “Performance Goals” to show the alignment of the Performance Goals with the Strategic Goals and Strategic Objectives.

- **Strategic Goal 1, Improve Safety of Operations:** Perform independent oversight of operational safety of DOE’s defense nuclear facilities to develop analysis, advice, and recommendations that will inform the Secretary of Energy in providing adequate protection of public health and safety at such defense nuclear facilities.
  - Strategic Objective 1.1—Accomplish independent and timely oversight to strengthen safety of operations involved in the maintenance of the nuclear weapons stockpile and in weapons-related research, development, and testing.
  - Strategic Objective 1.2—Accomplish independent and timely oversight to strengthen safety of operations in cleanup of legacy defense nuclear wastes and facilities.
- **Strategic Goal 2, Strengthen Safety Standards:** Recommend and promote effective safety standards for the Secretary of Energy to apply in providing adequate protection of public health and safety at such defense nuclear facilities.
  - Strategic Objective 2.1—Accomplish independent oversight to strengthen the development, implementation, and maintenance of DOE regulations, requirements, and guidance for providing adequate protection of public health and safety at defense nuclear facilities.
  - Strategic Objective 2.2— Accomplish independent oversight to improve the establishment and implementation of safety programs at defense nuclear facilities.
- **Strategic Goal 3, Strengthen Safety in Design:** Recommend and promote safety in design for new and modified defense nuclear facilities.
  - Strategic Objective 3.1—Accomplish independent oversight to strengthen the use of approved nuclear standards in the design and construction of defense nuclear facilities and major modifications to existing facilities.
  - Strategic Objective 3.2—Accomplish independent safety oversight to enhance the clear and deliberate implementation of the principles and core functions of integrated safety management in the design, construction, and upkeep of safety systems in defense nuclear facilities.
- **Strategic Goal 4, Achieve Excellence in Management and Communication with Stakeholders:** Operate in a manner that is accountable to the public and achieves the mission efficiently and effectively.
  - Strategic Objective 4.1—Improve management controls to achieve the Board’s mission efficiently and effectively.

- Strategic Objective 4.2— Improve the alignment of human capital strategies with agency mission, goals, and objectives through analysis, planning, investment, measurement, and management of human capital programs.
- Strategic Objective 4.3—Improve and sustain effective, transparent two-way communications between the Board and its stakeholders on safety issues in DOE's defense nuclear complex and on the Board's operations.

**Next Steps for Strategic Objectives.** In FY 2014, the Board implemented a new set of Strategic Objectives and corresponding Performance Goals for FY 2014 and FY 2015, which included the development and implementation of new metrics by which to measure the achievement of the Performance Goals. Follow-on goals to advance performance in these same areas are included for FY 2016. The Board will monitor the implementation of the new Goals, measure the progress against the Goals, and assess the feasibility and effectiveness of these Goals. If adjustments to or replacement of Goals is found to be necessary, the Board will make those changes and will incorporate them into the next Annual Performance Plan.



## **Performance Goals**

The Board’s Performance Goals for FY 2015 and FY 2016 are provided below, showing alignment with the agency’s Strategic Goals and Strategic Objectives. Senior managers within the agency are identified as “Goal Leaders” for each of the Board’s Strategic Objectives.

### **Strategic Goal 1, Improve Safety of Operations**

Goal: Perform independent oversight of operational safety of DOE’s defense nuclear facilities to develop analysis, advice, and recommendations that will inform the Secretary of Energy in providing adequate protection of public health and safety at such defense nuclear facilities.

<p><b>Strategic Objective 1.1</b>—Accomplish independent and timely oversight to strengthen safety of operations involved in the maintenance of the nuclear weapons stockpile and in weapons-related research, development, and testing.</p>
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<p><b>Leader: Group Lead for Nuclear Weapon Programs, OTD</b></p>
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<p><b>Performance Goal 1.1.1</b> – Conduct effective oversight through formal, well-planned safety reviews of the NNSA defense nuclear facilities engaged in maintenance of the nuclear weapons stockpile and in weapons-related research, development, and testing.</p>
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<p>Indicator: Number of reviews completed that comply with the Board’s new Technical Staff Instructions, Operating Procedures, and Internal Controls.</p>
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<p>FY 2015 Target:      10</p>
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<p>FY 2016 Target:      10</p>
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<p>Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.</p>
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<p><b>Performance Goal 1.1.2</b> - Conduct effective oversight through formal, well-planned reviews of NNSA’s nuclear explosives safety activities.</p>
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<p>Indicator: Number of reviews completed that comply with the Board’s new Technical Staff Instructions, Operating Procedures, and Internal Controls.</p>
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<p>FY 2015 Target:      3</p>
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<p>FY 2016 Target:      4</p>
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<p>Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.</p>
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<b>Performance Goal 1.1.3</b> – Notify NNSA of potential safety issues at NNSA defense nuclear facilities and in nuclear weapons operations.
Indicator: Percentage of Board letters regarding potential safety deficiencies sent to NNSA (for which the Board receives a response in the target year) that result in a positive NNSA response to assess the safety issues.
FY 2015 Target:        85%
FY 2016 Target:        85%
Trend Information:    The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

<b>Performance Goal 1.1.4</b> – Maintain a near-continuous oversight presence at each of the following sites: Los Alamos National Laboratory (LANL), Y-12 National Security Complex (Y-12), and Pantex.
Indicator: Number of days per year that a Site Representative or a member of the Board Technical Staff conducts safety oversight at each site (LANL, Y-12, and Pantex).
FY 2015 Target:        220
FY 2016 Target:        220
Trend Information:    The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Strategic Objective 1.2**—Accomplish independent and timely oversight to strengthen safety of operations in cleanup of legacy defense nuclear wastes and facilities.

**Leader: Group Lead for Nuclear Materials Processing and Stabilization, OTD**

**Performance Goal 1.2.1** – Conduct effective oversight through formal, well-planned safety reviews of DOE-Office of Environmental Management operating defense nuclear facilities and facilities undergoing decommissioning and decontamination.

Indicator: Number of reviews completed that comply with the Board’s new Technical Staff Instructions, Operating Procedures, and Internal Controls.

FY 2015 Target: 10

FY 2016 Target: 10

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Performance Goal 1.2.2** – Notify DOE of potential safety issues at DOE defense nuclear facilities and in nuclear waste remediation operations.

Indicator: Percentage of Board letters regarding potential safety deficiencies sent to DOE (for which the Board receives a response in the target year) that result in a positive DOE response to assess the safety issues.

FY 2015 Target: 85%

FY 2016 Target: 85%

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Performance Goal 1.2.3** – Maintain a near-continuous oversight presence at the Hanford Site and Savannah River Site (SRS).

Indicator: Number of days per year that a Site Representative or a member of the Board Technical Staff conducts safety oversight at each site (Hanford Site and SRS).

FY 2015 Target: 220

FY 2016 Target: 220

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

## Strategic Goal 2, Strengthen Safety Standards

Goal: Recommend and promote effective safety standards for the Secretary of Energy to apply in providing adequate protection of public health and safety at defense nuclear facilities.

**Strategic Objective 2.1**—Accomplish independent oversight to strengthen the development, implementation, and maintenance of DOE regulations, requirements, and guidance for providing adequate protection of public health and safety at defense nuclear facilities.

**Leader: Group Lead for Nuclear Programs and Analysis, OTD**

**Performance Goal 2.1.1** – Strengthen DOE’s Directives by providing timely oversight and comments to improve revised and newly issued DOE Directives (as noted on the list of “Directives of Interest to the Board”).

Indicator: Percentage of DOE Directives entering the review-comment period for which the Board provides comments on or before the Review Date Deadline.

FY 2015 Target: 95%

FY 2016 Target: 95%

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Performance Goal 2.1.2** – Conduct effective oversight of the implementation of DOE Directives (as noted on the list of “Directives of Interest to the Board”) through formal, well-planned safety reviews of DOE defense nuclear facilities.

Indicator: Number of reviews of the implementation of DOE Directives completed that comply with the new Technical Staff Instructions, Operating Procedures, and Internal Controls.

FY 2015 Target: 3

FY 2016 Target: 3

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Strategic Objective 2.2**— Accomplish independent oversight to improve the establishment and implementation of safety programs at defense nuclear facilities.

**Leader: Group Lead for Nuclear Programs and Analysis, OTD**

**Performance Goal 2.2.1** – Conduct effective oversight through formal, well-planned reviews of DOE’s establishment and implementation of safety programs at defense nuclear facilities.

Indicator: Number of reviews completed that comply with the Board’s new Technical Staff Instructions, Operating Procedures, and Internal Controls.

FY 2015 Target: 4

FY 2016 Target: 4

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Performance Goal 2.2.2** – Notify DOE of potential actions to improve establishment and implementation of safety programs at DOE defense nuclear facilities.

Indicator: Percentage of Board letters regarding potential safety deficiencies sent to DOE (for which the Board receives a response in the target year) that result in a positive DOE response to assess the safety issues.

FY 2015 Target: 85%

FY 2016 Target: 85%

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

### Strategic Goal 3, Strengthen Safety in Design

Goal: Recommend and promote safety in design for new and modified defense nuclear facilities.

**Strategic Objective 3.1**—Accomplish independent oversight to strengthen the use of approved nuclear standards in the design and construction of defense nuclear facilities and major modifications to existing facilities.

**Leader: Group Lead for Nuclear Facilities Design and Infrastructure, OTD**

**Performance Goal 3.1.1** – Promote and strengthen the early integration of safety into the design and construction of DOE’s defense nuclear facilities by reviewing the adequacy of safety design basis documents at major project Critical Decision milestones.

Indicator: Percentage of significant Hazard Category 2 projects achieving a Critical Decision milestone (CD-1, 2, 3, 4) for which the Board’s Technical Staff completes and documents in a staff report a review of the associated safety design basis document.

FY 2015 Target: 100%

FY 2016 Target: 100%

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Performance Goal 3.1.2** – Provide early notification to DOE of safety issues at DOE design and construction projects by issuing project letters within 60 days of major Critical Decision milestones to document the Board’s assessment of the project’s safety strategy and readiness to proceed with the next project stage.

Indicator: Percentage of significant Hazard Category 2 projects achieving a Critical Decision milestone (CD-1, 2, 3, 4) for which the Board issues a project letter to DOE within 60 days of DOE’s Critical Decision milestone.

FY 2015 Target: 100%

FY 2016 Target: 100%

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Strategic Objective 3.2**—Accomplish independent safety oversight to enhance the clear and deliberate implementation of the principles and core functions of integrated safety management in the design, construction, and upkeep of safety systems in defense nuclear facilities.

**Leader: Group Lead for Nuclear Facilities Design and Infrastructure, OTD**

**Performance Goal 3.2.1** – Conduct effective oversight through formal, well-planned reviews of the design, construction, and upkeep of safety systems at DOE’s defense nuclear facilities.

Indicator: Number of reviews completed that assess the ability of the safety systems to meet their safety function when called upon and that comply with the Board’s new Technical Staff Instructions, Operating Procedures, and Internal Controls.

FY 2015 Target: 10

FY 2016 Target: 10

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Performance Goal 3.2.2** – Notify DOE of potential safety issues regarding design and construction projects at defense nuclear facilities.

Indicator: Percentage of Board letters regarding potential safety deficiencies sent to DOE (for which the Board receives a response in the target year) that result in a positive DOE response to assess the safety issues.

FY 2015 Target: 85%

FY 2016 Target: 85%

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

## Strategic Goal 4, Achieve Excellence in Management and Communication with Stakeholders

Goal: Operate in a manner that is accountable to the public and achieves the mission efficiently and effectively.

**Strategic Objective 4.1**—Improve internal management controls to achieve the Board’s mission efficiently and effectively.

**Leader: Technical Director, OTD; General Manager, OGM; General Counsel, OGC**

**Performance Goal 4.1.1** – Within OTD, develop and implement formal procedures and Internal Controls prescribing effective and efficient safety oversight of DOE defense nuclear facilities.

Indicator: Percentage completion of implementation of new procedures.

FY 2015 Target: 100% complete for Phase 1 procedures  
50% complete for Phase 2 procedures

FY 2016 Target: 100% complete for Phase 2 procedures  
50% complete for Phase 3 procedures

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Performance Goal 4.1.2** – Within OGM, develop and implement formal procedures and Internal Controls prescribing effective and efficient support of the Board’s mission.

Indicator: Percentage completion of significant OGM work processes with effective procedures.

FY 2015 Target: 50% complete

FY 2016 Target: 75% complete

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.



<b>Performance Goal 4.1.3</b> – Within OGC, develop and implement formal procedures and Internal Controls prescribing effective and efficient support of the Board’s mission.
Indicator: Percentage completion of implementation of newly developed procedures. This indicator doesn’t include other OGC tasks or completed work.
FY 2015 Target: 33% complete
FY 2016 Target: 67% complete
Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Strategic Objective 4.2**— Improve the alignment of human capital management strategies with agency mission, goals, and objectives through workforce analysis, planning, investment, measurement, and management.

**Leader: General Manager, OGM**

<b>Performance Goal 4.2.1</b> – Achieve a more results-oriented performance culture.
Indicator: Number of employees operating under a performance-based appraisal system.
FY 2015 Target: (1) Implement a Senior Executive Service (SES) performance appraisal system that achieves certification by the Office of Personnel Management (OPM) by September 30, 2015. (2) Implement a revised GS performance management system that supports a results-oriented performance culture at the Board.
FY 2016 Target: Develop and implement electronic performance management systems for DN, General Schedule (GS), and SES performance appraisal systems by August 30, 2016.
Trend Information: The Board implemented a revised results-driven performance plan for its Technical Staff (DN) in FY 2013. Achievement of the FY 2015 target will result in the implementation of more results-oriented performance management systems for all Board employees.

<b>Performance Goal 4.2.2</b> – Address human capital gaps identified in critical mission functions.
Indicator: Number of unfulfilled critical missions functions.
FY 2015 Target: Develop a useful and flexible workforce management plan to address human capital gaps in the mission critical positions identified by Board’s Office Directors for FY 2015 execution.
FY 2016 Target: Develop a useful and flexible workforce management plan to address human capital gaps identified by the Board’s Office Directors for the entire Board and execute the plan by January 1, 2016.
Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Strategic Objective 4.3**—Improve and sustain effective, transparent two-way communications between the Board and its stakeholders on safety issues in DOE’s defense nuclear complex and on the Board’s operations.

**Leader: General Manager, OGM; General Counsel, OGC; Technical Director, OTD**

**Performance Goal 4.3.1** – Provide timely communications of safety observations obtained through direct oversight and maintaining cognizance of nuclear facilities at DOE’s nuclear weapons sites.

Indicator: Percentage of Site Representative Weekly reports documenting direct oversight posted to the Board’s public website within 35 days of the date of the report.

FY 2015 Target: 85%

FY 2016 Target: 85%

Trend Information: The Board began tracking this measure as a performance goal in FY 2014. For more information, refer to the FY 2014 APR.

**Performance Goal 4.3.2** – Inform the Congress and other stakeholders of potential safety issues early in the design and construction phases of DOE defense nuclear facilities.

Indicator: Number of *Reports to Congress on the Status of Significant Unresolved Technical Differences between the Board and the Department of Energy on Issues Concerning the Design and Construction of DOE’s Defense Nuclear Facilities* published and submitted to Congress. Inclusion within the Board’s Annual Report to Congress of a separate section bearing this title shall count as a report meeting this goal.

FY 2015 Target: 1

FY 2016 Target: 1

Trend Information: Although a new performance goal in FY 2014, the Board has been tracking this measure for multiple years as follows:

FY 2014:	3
FY 2013:	2
FY 2012:	2
FY 2011:	3
FY 2010:	3

<b>Performance Goal 4.3.3</b> – Effectively communicate safety issues by conducting public hearings in communities near DOE defense nuclear facilities and in Washington, DC.	
Indicator: Number of public hearings.	
FY 2015 Target:	3
FY 2016 Target:	3
Trend Information: Although a new performance goal in FY 2014, the Board has been tracking this measure for multiple years as follows:	
FY 2014:	3
FY 2013:	2
FY 2012:	3
FY 2011:	4
FY 2010:	2

## **Other Information**

**Major Management Priorities and Challenges.** The Board is pursuing several agency-wide initiatives in FY 2015 and FY 2016 to address recently identified challenges and new direction provided through congressional legislation. These initiatives include addressing opportunities for improving in the agency’s internal processes and procedures, continuing to align resources to address the additional workload from IG audits, and effectively managing change, both internal and as a result of changes in the DOE nuclear complex.

### *Improving Internal Processes*

In FY 2012, the Board commissioned an independent staffing analysis and an independent review of its internal processes and internal controls programs. These reviews highlighted several areas for improvement. The Board is addressing these areas by instituting new programs that will improve the effectiveness, efficiency, and long-term viability of the Board. The Board has taken aggressive action to meet these challenges. The most significant of these efforts, continuing through FY 2015 and FY 2016, include development of:

- Updated Board operating practices and procedures;
- Formal procedures and internal controls for the Office of the Technical Director (Performance Goal 4.1.1);
- Formal procedures and internal controls for the Office of the General Manager (Performance Goal 4.1.2);
- Formal procedures and internal controls for the Office of the General Counsel (Performance Goal 4.1.3);

- A formal Human Capital Management plan that includes effective programs for selection and hiring, knowledge transfer management, career development, training, and succession planning; and
- A SES performance management system capable of receiving OPM certification.

### *Inspector General*

The Consolidated Appropriations Act for FY 2014 assigned the NRC's Office of the Inspector General (NRC-OIG) to also serve as the Board's permanent IG effective in FY 2014. The NRC-OIG began work in the 3<sup>rd</sup> quarter of FY 2014, and completed two audits in administrative areas during FY 2014. FY 2015 will be the first full fiscal year during which the Board will operate with an IG, and the first year the IG will begin reviews/audits of the Board's technical operations. This is expected to be a significant effort, and additional staff resources will be required to support the audits and requests for information by the NRC-OIG.

**Evidence Building/Data Validation and Verification.** As a small agency in the executive branch, the Board does not maintain organizational components dedicated to research or evaluation. The Board tracks progress toward meeting its technical performance goals on a quarterly basis by evaluating its progress toward the target for each goal. For example, for Performance Goal 1.2.1, the Nuclear Materials Processing and Stabilization Group Lead determined the number of reviews completed in accordance with the Board's new internal procedures on a quarterly basis. Each group lead completes records of accomplishment to verify the target metric. The Board's Performance Assurance Group compiles the records of accomplishment, compares the information in the records of accomplishment to the established target metrics, and develops a report for Board management to provide the status of meeting performance goals.

To complete the records of accomplishment, group leads use data sources that include publicly available correspondence and staff issue reports and internally available information papers and group progress reports; these reports and papers document the activities performed by the Board's staff throughout the year. The Board makes its correspondence, staff issue reports, information papers, and group progress reports readily available to its staff, and the Board employs a robust review process, including factual accuracy checks, for its public reports and internal papers. Therefore, the review process ensures the accuracy of the data.

By tracking its progress toward meeting its performance goals on a quarterly basis, the Board is able to adjust its priorities and resources to meet performance goals.

## 6. ANNUAL PERFORMANCE REPORT

The FY 2014 accomplishments shown in the APR are the first to align with the Performance Goals established under the Strategic Goals published in the Board's *Defense Nuclear Facilities Safety Board Strategic Plan, FY 2014–2018*, i.e.,

- Strategic Goal 1 – Improve Safety of Operations
- Strategic Goal 2 – Strengthen Safety Standards
- Strategic Goal 3 – Strengthen Safety in Design
- Strategic Goal 4 – Achieve Excellence in Management and Communication with Stakeholders

Performance accomplishments for FY 2013 and FY 2012 are included in the format used in those years, i.e., aligned with the Performance Objectives established under the Strategic Goals published in the Board's *Defense Nuclear Facilities Safety Board Strategic Plan, FY 2011–2016*, i.e.,

- Strategic Goal 1 – Safe Nuclear Weapons Operations
- Strategic Goal 2 – Safe Processing and Stabilization of Nuclear Material
- Strategic Goal 3 – Safety in Nuclear Facilities Design and Infrastructure
- Strategic Goal 4 – Effective Nuclear Safety Programs and Analysis
- Strategic Goal 5 – Management Excellence

FY 2011 performance accomplishments to the predecessor strategic goals for 1 through 4 are also included. Performance accomplishments for Management Excellence were first reported in FY 2012.

## Strategic Goal 1, Improve Safety of Operations

**Strategic Goal 1: Perform independent oversight of operational safety of DOE’s defense nuclear facilities to develop analysis, advice, and recommendations that will inform the Secretary of Energy in providing adequate protection of public health and safety at such defense nuclear facilities.**

**Strategic Objective 1.1: Accomplish independent and timely oversight to strengthen safety of operations involved in the maintenance of the nuclear weapons stockpile and in weapons-related research, development, and testing.**

### Performance Goal 1.1.1

Fiscal Year	Goal Statement and Target	Target Measure, Milestone, or Deliverable	Result
2014	<p>Conduct effective oversight through formal, well-planned safety reviews at the NNSA’s defense nuclear facilities engaged in maintenance of the nuclear weapons stockpile and in weapons-related research, development, and testing.</p> <p>Target: Complete reviews that comply with the Board’s new Technical Staff Instructions, Operating Procedures, and Internal Controls</p>	Complete 8 reviews	Achieved  8 Reviews
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

### Discussion:

The Board’s technical staff conducted the following reviews to meet the above objective of conducting effective oversight of NNSA defense nuclear facilities engaged in maintenance of the nuclear weapons stockpile and in weapons-related research, development, and testing. The FY 2014 goal was to complete a minimum of eight safety oversight reviews. That goal was accomplished.

1. Los Alamos National Laboratory (LANL) Area G Basis for Interim Operation (BIO) Review, January 2014. Scope: Follow-up review of the BIO at LANL Area G transuranic waste facilities to discuss actions taken since the November 19, 2012, Board letter on the Area G BIO, review the details of the latest revision to the Area G BIO, and validate planned improvements in the safety basis and the configuration of the facilities.
2. Los Alamos National Laboratory TA-55 Criticality Safety Follow-up Review, April 2014 and June 2014. Scope: Evaluate actions taken by LANL and NNSA to address weaknesses

in conduct of operations and criticality safety that led to suspending operations at the LANL Plutonium Facility in June 2013.

3. Nevada National Security Site (NNSS) Conduct of Operations and Maintenance Review, December 2013. Scope: Review the conduct of operations and maintenance programs at the following Hazard Category 2 and Hazard Category 3 facilities: Device Assembly Facility, including the National Criticality Experiments Research Center; Joint Actinide Shock Physics Experimental Research Facility (JASPER); Ula Complex; and the Radiological Waste Management Complex.
4. Pantex Electrical Distribution System and Electrical Safety Program Review, December 2013. Scope: The review focused on system modifications, maintenance, physical condition, and supporting engineering evaluations (e.g., calculations and assessments).
5. Y-12 National Security Complex (Y-12) Nuclear Operations and Maintenance Field-Based Assessment, January 2014. Scope: Evaluate the performance of nuclear operations and maintenance work in Y-12's defense nuclear facilities through field-based observations in Buildings 9212, 9215, 9204-2E, 9204-2, and 9720-82.
6. Y-12 National Security Complex Criticality Safety Review, March 2014. Scope: Evaluate the Y-12 contractor's processes for developing, designing, implementing, maintaining, ensuring quality assurance of, and performing configuration management of non-credited criticality safety controls as compared to safety-significant controls (the term "non-credited criticality safety controls" refers to those controls identified by a criticality safety evaluation, but not elevated for inclusion in a facility's documented safety analysis and technical safety requirements).
7. Y-12 National Security Complex Building 9204-2E/9720-82 Toxicological Hazard Analysis and Material Storage Review, April 2014. Scope: Evaluate the adequacy of hazard/accident analyses, control strategies, and disposition planning for storage of unique hazardous materials at Y-12 defense nuclear facilities.
8. Y-12 National Security Complex Conduct of Maintenance Review, June 2014. Scope: Evaluate the programmatic elements and field implementation of aging infrastructure maintenance at Y-12's highest hazard facilities (Buildings 9212, 9204-2, 9204-2E, and 9215).

Additionally, the following significant staff reviews completed during FY 2014 were not explicitly counted in this performance metric.

*Lawrence Livermore National Laboratory*

1. Probabilistic Seismic Hazard Analysis Update
2. Oversight of Radiation Protection
3. Oversight of Vital Safety Systems

### *Los Alamos National Laboratory*

1. Oversight of DOE Office of Safety and Emergency Management (HS-45) review of Radiological Control Implementation
2. Plutonium Facility (PF-4) Operations During Laboratory Pause (Los Alamos National Laboratory Plutonium Seismic Safety)
3. PF-4 Material-at-Risk
4. Confinement Vessel Disposition Project and Operations
5. PF-4 Alternate Seismic Analysis
6. DOE actions to address Recommendation 2009-2
7. Radioassay and Nondestructive Testing Facility Documented Safety Analysis
8. Area G Basis for Interim Operations Review Part 2
9. Oversight of Seismic Exploratory Testing for Update of Probabilistic Seismic Hazard Analysis

### *Pantex Plant*

1. Fire Protection Systems Reliability
2. W76 Weapon Response Technical Basis
3. Oversight of Two Annual Emergency Management Exercises
4. Conduct of Operations
5. Falling Man Weapon Impacts Methodology
6. Unreviewed Safety Question/Potential Inadequacy in Safety Analysis Process
7. Oversight of Management & Operating Contract Transition

### *Y-12 National Security Complex*

1. Missing Lateral Bracing at Building 9215
2. Direct Electrolytic Reduction (DER) and Electrolytic Refining (ER)
3. Aging Infrastructure: Buildings 9204-2E and 9215 Structural Systems
4. Management & Operating Contract Transition
5. 2014 Annual Site Emergency Exercise



## Performance Goal 1.1.2

Fiscal Year	Goal Statement and Target	Target Measure, Milestone, or Deliverable	Result
2014	<p>Conduct effective oversight through formal, well-planned reviews of NNSA's nuclear explosive safety (NES) activities.</p> <p>Target: Complete reviews that comply with the Board's new Technical Staff Instructions, Operating Procedures, and Internal Controls</p>	Complete 3 reviews	<p>Achieved</p> <p>3 Reviews</p>
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

### Discussion:

The Board's technical staff conducted the following reviews to meet the above objective of effective oversight of NNSA's nuclear explosive safety activities. The FY 2014 goal was to complete a minimum of three safety oversight reviews. That goal was accomplished.

1. Onsite Transportation and Staging NES Master Study, November 2013. Scope: Reviewed input documents, the study report, and close-out results.
2. W88 NES Operational Safety Review (OSR), January–February 2014. Scope: Reviewed input documents, two OSR study reports, and close-out results.
3. Approved Equipment Program NES Master Study Module II (Special Tooling), November–May 2014. Scope: Reviewed input documents, observed development of the study report, the presentation of the study report to NNSA management, the NNSA management disposition of all NES inadequacies identified, final closure of the NES study, and authorization of nuclear explosive operations. Held video-teleconferences with NNSA to discuss concerns that arose when NNSA downgraded a pre-start finding.

Additionally, the following significant staff reviews completed during FY 2014 were not explicitly counted in this performance metric:

1. Bays and Cells NES Master Study Observation
2. Approved Equipment Program NES Master Study Modules 3 and 4 (Supplemental Equipment Program, the Qualified Container Program, and the Category 2 and 3 Electrical Equipment Programs)
3. Proposed Changes to NES Directives
4. Special Purpose Facilities NES Master Study
5. W78 NES Study
6. Support Activities NES Master Study

### Performance Goal 1.1.3

Fiscal Year	Goal Statement and Target	Target Measure, Milestone, or Deliverable	Result
2014	<p>Notify NNSA of potential safety issues at NNSA defense nuclear facilities and in nuclear weapons operations.</p> <p>Target: Ensure Board letters regarding potential safety deficiencies sent to NNSA result in a positive NNSA response to assess the safety issues.</p>	80% of letters result in positive NNSA response	<p>Achieved</p> <p>100% of letters resulted in positive NNSA response.</p>
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

#### Discussion:

The metric used to evaluate this goal is limited to reviews that resulted in official Board correspondence to DOE. Each of the reviews described above resulted in the communication of Board staff concerns to the appropriate DOE/NNSA field office personnel, many of which resulted in action intended to effect improvement. This goal focuses on those issues that were evaluated as significant enough to merit correspondence. Board correspondence can be in the form of a letter that does not request a written response from DOE/NNSA, or in the form of a letter with a reporting requirement or a Board Recommendation, both of which require a written response. The correspondence issued to NNSA on potential safety issues at NNSA defense nuclear facilities and in nuclear weapons operations during FY 2014, and the response by NNSA, are listed below:

1. Y-12 and Pantex M&O Contract Transition. Board correspondence date: April 30, 2014. DOE/NNSA response date: Written response not required. Assessment of response: Positive.
2. SNL Conduct of Operations and Maintenance. Board correspondence date: May 12, 2014. DOE/NNSA response date: Written response not required. Assessment of response: Positive.
3. LANL Criticality Safety. Board correspondence date: May 16, 2014. DOE/NNSA response date: May 30, 2014. Assessment of response: Positive.
4. Pantex Falling Man Special Tooling Concerns. Board correspondence date: June 2, 2014. DOE/NNSA response date: Written response received July 11, 2014; briefing due in FY 2015. Assessment of response: To be determined based on briefing.
5. NNSA Administrator Welcome Letter. Board correspondence date: August 7, 2014. DOE/NNSA response date: Written response not required, but provided by NNSA on September 16, 2014. Assessment of response: Positive.

**Performance Goal 1.1.4**

<b>Fiscal Year</b>	<b>Goal Statement and Target</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	Maintain a near-continuous oversight presence at each of the following sites: Los Alamos National Laboratory (LANL), Y-12 National Security Complex (Y-12), and Pantex.  Target: Number of days per year that a site representative or a member of the Board technical staff conducts safety oversight at each site (LANL, Y-12, and Pantex).	220 days	Achieved  Coverage exceeded the target of 220 days
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

**Discussion:**

The Board’s site representatives and technical staff members conducted safety oversight and maintained a near-continuous oversight presence at LANL, Y-12, and Pantex during FY 2014.

- At LANL, the Board’s site representatives and technical staff members conducted 235 days of safety oversight, which exceeded the performance goal of 220 days.
- At Y-12, the Board’s site representatives and technical staff members conducted 236 days of safety oversight, which exceeded the performance goal of 220 days.
- At Pantex, the Board’s site representative and technical staff members conducted 236 days of safety oversight, which exceeded the performance goal of 220 days.

**Strategic Objective 1.2: Accomplish independent and timely oversight to strengthen safety of operations in cleanup of legacy defense nuclear wastes and facilities.**

**Performance Goal 1.2.1**

<b>Fiscal Year</b>	<b>Goal Statement and Target</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	<p>Conduct effective oversight through formal, well-planned safety reviews at DOE-Office of Environmental Management operating defense nuclear facilities and facilities undergoing decommissioning and decontamination.</p> <p>Target: Complete reviews that comply with the Board’s new Technical Staff Instructions, Operating Procedures, and Internal Controls.</p>	Complete 8 reviews	Achieved  8 Reviews
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

**Discussion:**

The Board’s technical staff conducted the following reviews to meet the above objective of conducting effective oversight of DOE-Office of Environmental Management (EM) facilities. The FY 2014 goal was to complete a minimum of eight oversight reviews. That goal was accomplished. Additionally, events at the Waste Isolation Pilot Plant in February 2014 resulted in an adjustment in priorities with an accompanying significant effort to provide effective, real-time assessment of EM’s initial response and subsequent efforts to develop and begin implementation of a recovery plan.

1. Hanford Tank AY-102 Decanting Impacts, October 2013. Scope: At the request of senior DOE Management (EM-1), review the safety implications of removing most of the liquid radioactive waste from Hanford’s leaking Double-Shell Tank AY-102.
2. Hanford 242-A Evaporator Safety Basis, March 2014. Scope: Review the newly revised safety basis and safety systems for the 242-A Evaporator Facility at the Hanford site.
3. Hanford Waste Encapsulation and Storage Facility Aging Infrastructure, May 2014. Scope: Review safety significant systems, structures, and components at Hanford’s Waste Encapsulation and Storage Facility.
4. Savannah River Site (SRS) H-Canyon and Tank Farms Ventilation Systems, December 2013. Scope: Review ventilation systems at the Tank Farms and H-Canyon facilities, including aging and maintenance issues.

5. SRS H-Canyon/HB-Line Ground Level Release Accident Scenario, July 2014. Scope: Review changes to the safety basis of the H-Canyon facility made by DOE after discovering the possibility that radiological material could be released at ground level instead of stack level following a seismically-induced accident.
6. SRS Maintenance Programs, July 2014 and August 2014. Scope: Review site maintenance programs, including backlogs and reliability of safety systems.
7. Idaho National Laboratory, DOE Readiness Assessment for the Integrated Waste Treatment Unit (IWTU), March 2014. Scope: Observe and assess the DOE Readiness Assessment team's evaluation of the readiness of the IWTU facility to commence operations involving radioactive waste.
8. Waste Isolation Pilot Plant (WIPP), Oversight of Recovery and Investigation into Fire and Radioactive Material Release Events, February–June 2014. Scope: In response to two February 2014 events at WIPP, a salt haul truck fire on February 5, 2014, and a radiological release event on February 14, 2014, provide continuous coverage of recovery actions and accident investigations, with nearly continuous presence on site from February 2014 through June 15, 2014, with analytical support by a team at the Board's Washington, DC, headquarters.

Additionally, the following significant staff reviews completed during FY 2014 were not explicitly counted in this performance metric:

*Hanford Site*

1. Justification for Continued Operations for Hanford Tanks with Deep Sludge
2. Hanford Tank AY-102 Continuing Leak Assessment
3. Hanford Emergency Preparedness and Response

*Idaho National Laboratory*

1. IWTU Startup Testing

*Savannah River Site*

1. Electrical Distribution Systems

## Performance Goal 1.2.2

Fiscal Year	Goal Statement and Target	Target Measure, Milestone, or Deliverable	Result
2014	Notify DOE of potential safety issues at DOE defense nuclear facilities and in nuclear waste remediation operations.  Target: Ensure Board letters regarding potential safety deficiencies sent to DOE result in a positive DOE response to assess the safety issues.	80% of letters result in positive DOE response	Achieved  100% of letters resulted in positive DOE response.
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

### Discussion:

The metric used to evaluate this goal is limited to reviews that resulted in official Board correspondence to DOE. Each of the reviews described above resulted in the communication of Board staff concerns to the appropriate DOE field office personnel, many of which resulted in action intended to effect improvement. This goal focuses on those issues that were evaluated as significant enough to merit correspondence. Board correspondence can be in the form of a letter that does not request a written response from DOE, or in the form of a letter with a reporting requirement or a Board recommendation, both of which require a written response. The correspondence issued to DOE on potential safety issues at DOE defense nuclear facilities and in nuclear waste remediation operations during FY 2014, and the response by DOE, are listed below:

1. Safety and Integrity Implications of Decanting Liquid from Hanford Tank 241-AY-102. Board correspondence date: November 1, 2013. DOE response date: Written response not required. Assessment of response: Positive.
2. Waste Isolation Pilot Plant Confinement Ventilation System. Board correspondence date: March 12, 2014. DOE response date: Written response not required. Assessment of response: Positive.
3. State of Operations at Savannah River Site. Board correspondence date: May 16, 2014. DOE response date: Written response not required. Assessment of response: Positive.
4. Idaho National Laboratory Integrated Waste Treatment Unit Readiness. Board correspondence date: May 23, 2014. DOE response date: June 20, 2014. Assessment of response: Positive.
5. Safety Basis Review of Hanford 242-A Evaporator at Hanford Site. Board correspondence date: June 18, 2014. DOE response date: August 28, 2014. Assessment of response: Positive.

**Performance Goal 1.2.3**

<b>Fiscal Year</b>	<b>Goal Statement and Target</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	Maintain a near-continuous oversight presence at the Hanford Site and Savannah River Site (SRS).  Target: Number of days per year that a site representative or a member of the Board technical staff conducts safety oversight at each site (Hanford Site and SRS).	220 days	Achieved  Coverage exceeded the target of 220 days
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

**Discussion:**

The Board’s site representatives and technical staff members conducted safety oversight and maintained a near-continuous oversight presence at Hanford and SRS during FY 2014.

- At Hanford, the Board’s site representatives and technical staff members conducted 244 days of safety oversight, which exceeded the performance goal of 220 days.
- At SRS, the Board’s site representatives and technical staff members conducted 241 days of safety oversight, which exceeded the performance goal of 220 days.

## Strategic Goal 2, Strengthen Safety Standards

**Strategic Goal 2: Recommend and promote effective safety standards for the Secretary of Energy to apply in providing adequate protection of public health and safety at such defense nuclear facilities.**

**Strategic Objective 2.1: Accomplish independent oversight to strengthen the development, implementation, and maintenance of DOE regulations, requirements, and guidance for providing adequate protection of public health and safety at defense nuclear facilities.**

### Performance Goal 2.1.1

<b>Fiscal Year</b>	<b>Goal Statement and Target</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	Strengthen DOE’s Directives by providing timely oversight and comments to improve revised and newly issued DOE Directives (as noted on the list of “Orders of Interest to the Board”).  Target: Percentage of DOE Directives entering the review-comment period for which the Board provides comments on or before the Review Date Deadline.	90%	Not Achieved  74%
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

#### **Discussion:**

During FY 2014, the Board’s staff completed reviews of 27 DOE directives, with 20 of the reviews (74%) completed by the Review Date Deadline.

#### **Information on Unmet Target:**

The timeliness of Board reviews of DOE Standards improved significantly after the implementation of new internal control processes at mid-year. During the 3<sup>rd</sup> and 4<sup>th</sup> quarters of the fiscal year, the timeliness response rate to DOE from the Board was nearly 100%. Future performance is expected to meet the target for timeliness.



## Performance Goal 2.1.2

Fiscal Year	Goal Statement and Target	Target Measure, Milestone, or Deliverable	Result
2014	<p>Conduct effective oversight of the implementation of DOE Directives (as noted on the list of “Orders of Interest to the Board”) through formal, well-planned safety reviews at DOE defense nuclear facilities.</p> <p>Target: Number of reviews of the implementation of DOE Directives completed that comply with the new Technical Staff Instructions, Operating Procedures, and Internal Controls.</p>	Complete 2 reviews	<p>Achieved</p> <p>2 Reviews</p>
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

### Discussion:

In FY 2014, two reviews were completed to provide independent oversight to strengthen the development, implementation, and maintenance of DOE regulations, requirements, and guidance for providing adequate protection of public health and safety at defense nuclear facilities. These reviews covered the following topics:

1. Sandia National Laboratories Conduct of Operations and Maintenance, February 4–6, 2014. Scope: Review the conduct of operations and maintenance programs at Sandia National Laboratories’ Annular Core Research Reactor Facility, Auxiliary Hot Cell Facility, and Sandia Pulsed Reactor Facility.
2. Savannah River Site Salt Waste Processing Facility Quality Assurance Program, January 2014 and June 2014. Scope: Observe and evaluate DOE-Headquarters audits and assessments of the SWPF quality assurance program.

Each of these reviews identified shortcomings in which DOE was not meeting the expectations outlined in DOE directives and guidance documents.

**Strategic Objective 2.2: Accomplish independent oversight to improve the establishment and implementation of safety programs at defense nuclear facilities.**

**Performance Goal 2.2.1**

<b>Fiscal Year</b>	<b>Goal Statement and Target</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	<p>Conduct effective oversight through formal, well-planned reviews of DOE’s establishment and implementation of safety programs at defense nuclear facilities.</p> <p>Target: Number of reviews completed that comply with the Board’s new Technical Staff Instructions, Operating Procedures, and Internal Controls.</p>	Complete 3 reviews	<p>Achieved</p> <p>3 Reviews</p>
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

**Discussion:**

In FY 2014, three reviews were completed to evaluate the establishment and implementation of safety programs at defense nuclear facilities. These reviews covered the following topics:

1. Hanford Plutonium Finishing Plant Activity-Level Work Planning and Control, April 1–3, 2014. Scope: Review activity-level work planning and control for deactivation activities at the Hanford Plutonium Finishing Plant.
2. Savannah River Nuclear Solutions Activity-Level Work Planning and Control, June 17–19, 2014. Scope: Review activity-level work planning and control at Savannah River National Laboratory, H-Canyon, and the Tritium Facility.
3. DOE Headquarters Emergency Response Function, April 28, 2014. Scope: Review the readiness of the DOE Headquarters Emergency Response Team to respond to an emergency at a DOE site.

Each of these reviews resulted in information exchanges between the Board, DOE, and its contractors that identified potential improvements to the safety programs that were reviewed at each site or facility.

## Performance Goal 2.2.2

Fiscal Year	Goal Statement and Target	Target Measure, Milestone, or Deliverable	Result
2014	<p>Notify DOE of potential actions to improve establishment and implementation of safety programs at DOE defense nuclear facilities.</p> <p>Target: Percentage of Board letters regarding potential safety deficiencies sent to DOE that result in a positive DOE response to assess the safety issues.</p>	80% of letters result in positive DOE response	<p>Achieved</p> <p>100% of letters resulted in positive DOE response</p>
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

### Discussion:

The metric used to evaluate this goal is limited to reviews that resulted in official Board correspondence to DOE. Each of the reviews described above resulted in the communication of Board staff concerns to the appropriate DOE field office personnel, many of which resulted in action intended to effect improvement. This goal focuses on those issues that were evaluated as significant enough to merit correspondence. Board correspondence can be in the form of a letter that does not request a written response from DOE, or in the form of a letter with a reporting requirement or a Board Recommendation, both of which require a written response. The correspondence issued to DOE regarding actions to improve establishment and implementation of safety programs during FY 2014, and the response by DOE, are listed below:

1. Closure of Recommendation 2005-1, Nuclear Material Packaging, and Reporting Requirements on DOE Manual 441.1-1, Nuclear Material Packaging Manual. Board correspondence date: March 31, 2014. DOE response date: July 30, 2014. Assessment of response: Positive.
2. Resources to Augment Waste Isolation Pilot Plant Emergency Response Capabilities and Specific Preconditions and Contingency Plans to Ensure Protection of the Public and Workers. Board correspondence date: March 28, 2014. DOE response date: April 4, 2014. Assessment of response: Positive.
3. Process to Revise, Update, and Improve the DOE Directives and Technical Standards of Interest to the Board. Board correspondence date: April 4, 2014. DOE response date: July 17, 2014. Assessment of response: Positive.
4. Closure of Recommendation 2004-1, Oversight of Complex, High-Hazard Nuclear Operations. Board correspondence date: May 1, 2014. DOE response date: To be determined, expected 1<sup>st</sup> quarter FY 2015. Assessment of response: To be determined (and reported on) in FY 2015.

5. Recommendation 2014-1, *Emergency Preparedness and Response*. Board correspondence date: September 3, 2014. DOE response date: To be determined. Assessment of response: To be determined (and reported on) in FY 2015.

**Strategic Goal 3, Strengthen Safety in Design**

**Strategic Goal 3: Recommend and promote safety in design for new and modified defense nuclear facilities.**

**Performance Goal 3.1.1**

<b>Fiscal Year</b>	<b>Goal Statement and Target</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	<p>Promote and strengthen the early integration of safety into the design and construction of DOE’s defense nuclear facilities by reviewing the adequacy of safety design basis documents at major project Critical Decision milestones.</p> <p>Target: Percentage of significant Hazard Category 2 projects achieving a Critical Decision milestone (CD-1, 2, 3, 4) for which the Board’s technical staff completes and documents in a staff report a review of the associated safety design basis document.</p>	100%	<p>Achieved</p> <p>100% Complete</p>
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

**Discussion:**

During FY 2014, the Board’s technical staff completed and documented reviews of the safety design basis document for three significant Hazard Category 2 projects that were approaching a Critical Decision milestone. This corresponds to an actual result of 100%. These projects include one that achieved the CD-1 preliminary design milestone in October 2014, Sludge Processing Facility Buildouts (DOE Project # 15-D-405), and two that achieved the CD-3 final design milestone during FY 2014, Transuranic (TRU) Waste Facility (DOE Project # 12-D-301) and KW Basin Sludge Removal Project (DOE Project # 15-D-401).

### Performance Goal 3.1.2

Fiscal Year	Goal Statement and Target	Target Measure, Milestone, or Deliverable	Result
2014	<p>Provide early notification to DOE of safety issues at DOE design and construction projects by issuing project letters in advance of major Critical Decision milestones to document the Board’s assessment of the project’s safety strategy and readiness to proceed with the next project stage.</p> <p>Target: Percentage of significant Hazard Category 2 projects achieving a Critical Decision milestone (CD-1, 2, 3, 4) for which the Board issues a project letter to DOE in advance of the Critical Decision milestone.</p>	100%	<p>Not Achieved</p> <p>33% Complete</p>
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

#### Discussion:

During FY 2014, the Board issued project letters for three significant Hazard Category 2 projects that were approaching a Critical Decision milestone (CD-1, 2, 3, or 4). These projects include one that achieved the CD-1 preliminary design milestone in October 2014, Sludge Processing Facility Buildouts (DOE Project # 15-D-405), and two that achieved the CD-3 final design milestone in FY 2014, Transuranic (TRU) Waste Facility (DOE Project # 12-D-301) and KW Basin Sludge Removal Project (DOE Project # 15-D-401). One of the project letters was issued in advance of the CD milestone. This corresponds to a success rate of 33% for this performance goal.

#### Information on Unmet Target

In the Board’s and DOE’s July 2007 joint report to Congress titled *Improving the Identification and Resolution of Safety Issues During the Design and Construction of DOE Defense Nuclear Facilities*, the Board committed to issue project letters to DOE to “summarize unresolved safety issues and Board view of safety status of projects at appropriate critical decisions.” To promote effective communication to DOE on issues identified by the Board, the Board strives to provide project letters in advance of DOE’s approval of a CD milestone. This allows for DOE to possess a complete understanding of the Board’s concerns with the project when considering approval of the CD milestone. The Board issued project letters for the Transuranic (TRU) Waste Facility (DOE Project # 12-D-301) and KW Basin Sludge Removal Project (DOE Project # 15-D-401) 20 and 88 days after those projects achieved their respective CD milestones. Given that the Board’s new Technical Staff Instructions, Operating Procedures, and Internal Controls are still in the process of being implemented, the Board expects improved performance for this performance goal in FY 2015. Additionally, the Board is revising the target for this goal for FY 2015 and 2016 to measure

issuance of project letters within 60 days of DOE’s Critical Decision milestones, instead of in advance of the milestones, because DOE, not the Board, controls when Critical Decision milestones are approved.

**Strategic Objective 3.2: Accomplish independent safety oversight to enhance the clear and deliberate implementation of the principles and core functions of integrated safety management in the design, construction, and upkeep of safety systems in defense nuclear facilities.**

**Performance Goal 3.2.1**

<b>Fiscal Year</b>	<b>Goal Statement and Target</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	<p>Conduct effective oversight through formal, well-planned reviews of the design, construction, and upkeep of safety systems at DOE’s defense nuclear facilities.</p> <p>Target: Number of reviews of safety systems completed that comply with the Board’s new Technical Staff Instructions, Operating Procedures, and Internal Controls.</p>	Complete 6 reviews	<p>Achieved</p> <p>6 Reviews</p>
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

**Discussion:**

In FY 2014, six reviews of safety systems were completed that comply with the Board’s new Technical Staff Instructions, Operating Procedures, and Internal Controls. These reviews covered the following topics:

- Probabilistic Seismic Hazard Analysis at the Idaho National Laboratory
- Probabilistic Seismic Hazard Analysis at the Hanford site
- Aging management of waste transfer lines at the Savannah River Site
- Ammonia Hazards at the Hanford Waste Treatment and Immobilization Plant Project
- Safety Design Strategy for the High Level Waste Facility at the Hanford Waste Treatment and Immobilization Plant Project
- Volcanic Ashfall Hazard at the Hanford Waste Treatment and Immobilization Plant Project

Given that the Board’s new Technical Staff Instructions, Operating Procedures, and Internal Controls relevant to these reviews were in effect for about two-thirds of FY 2014, the Board established an increased target of 10 reviews for FY 2015 and FY 2016. Further, the description of this performance goal will be clarified for FY 2015 and beyond to be consistent with the important nuclear safety design criterion that safety systems must be able to perform their safety function when called upon in an accident condition. This clarification ensures that future reviews will

consider both the capability of the safety systems and the severity of the accident conditions to which the systems must be designed.

### Performance Goal 3.2.2

Fiscal Year	Goal Statement and Target	Target Measure, Milestone, or Deliverable	Result
2014	Notify DOE of potential safety issues regarding design and construction projects at defense nuclear facilities.  Target: Ensure Board letters regarding potential safety deficiencies sent to DOE result in a positive DOE response to assess the safety issues.	80% of letters result in positive DOE response	Achieved  100% of letters resulted in positive DOE response.
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

#### Discussion:

The metric used to evaluate this goal is limited to reviews that resulted in official Board correspondence to DOE. Each of the reviews described above resulted in the communication of Board staff concerns to the appropriate DOE field office personnel, many of which resulted in action intended to effect improvement. This goal focuses on those issues that were evaluated as significant enough to merit correspondence. Board correspondence can be in the form of a letter that does not request a written response from DOE, or in the form of a letter with a reporting requirement or a Board recommendation, both of which require a written response. The correspondence issued to DOE on potential safety issues at DOE defense nuclear facilities and in nuclear waste remediation operations during FY 2014, and the response by DOE, is listed below:

1. Transuranic Waste Processing Center Sludge Processing Facility Buildouts Project at Oak Ridge National Laboratory. Correspondence date: November 8, 2013. DOE response date: Written response not required. Assessment of response: Positive.
2. Transuranic Waste Facility Project at Los Alamos National Laboratory. Correspondence date: August 7, 2014. DOE response date: September 15, 2014. Assessment of response: Positive.

**Strategic Goal 4: Achieve Excellence in Management and Communication with Stakeholders**

**Strategic Objective 4.1: Improve management controls to achieve the Board’s mission.**

**Strategic Objective 4.1: Improve management controls to achieve the Board’s mission.**

**Performance Goal 4.1.1**

<b>Fiscal Year</b>	<b>Goal Statement and Target</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	<p>Within the Office of the Technical Director (OTD), develop and implement formal procedures and Internal Controls prescribing effective and efficient safety oversight of DOE defense nuclear facilities.</p> <p>Target: Percentage completion of implementation of new procedures.</p>	100% complete for Phase 1 procedures	<p>Not Achieved</p> <p>48% Complete</p>
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

**Discussion:**

In FY 2013, the Board, following recommendations received from two separate external assessments, decided to establish clearly documented internal controls for Technical Staff operations. The primary goals of this ongoing effort are to provide:

- Efficient and effective practices, policies, and procedures that enable managers to effectively plan, organize, direct, control, and report agency operations;
- Visibility to support efforts to manage quality, timeliness, and productivity, and control cost; and
- A uniform and measurable method for Technical Staff accomplishment of the Board’s oversight mission.

This large effort was divided into three phases, with implementation planned to occur over three years.

- Phase 1, which includes most of the Technical Staff day-to-day work processes, was scheduled to be complete by the end of FY 2014;
- Phase 2, which includes less frequently used Technical Staff work process and knowledge transfer documents, was planned to be complete by the end of FY 2015; and
- Phase 3, which includes processes that support Technical Staff development and human capital management, was scheduled to be complete in FY 2016.
- Phase 1 includes 29 Instructions, Operating Procedures, and Notices. Those documents were divided into six implementation packages. Three of the Phase 1 implementation



packages comprising 48% of the Phase 1 documents have been implemented. Phase 1 is now expected to be complete by March 13, 2015.

**Information on Unmet Target**

In April 2014, the Technical Director evaluated the status of Technical Staff Internal Control (TSIC) implementation efforts. Based on that evaluation, he reached three conclusions:

- More time was necessary to complete implementation activities related to recently approved processes;
- The technical staff needed additional time to integrate the newly established procedures into their normal work flow before implementing additional procedures; and
- The technical staff needed some uninterrupted time for mission execution.

The Technical Director also determined that it would be appropriate to evaluate the effectiveness of ongoing implementation efforts and make adjustments or improvements to the implementation process at a relatively early stage to help improve the efficiency and effectiveness of the overall effort. Consequently, on May 1, 2014, the Technical Director paused the implementation of new Phase 1 documents. The pause was lifted in August 2014, and implementation training resumed in September 2014. Although the pause delayed the Phase 1 completion date, the pause also helped improve Technical Staff implementation of the new procedures and allowed a more complete integration of the new procedures into the Technical Staff work flow. Additionally, the results of evaluations conducted during the pause are expected to support more efficient accomplishment of the remaining TSIC effort.

**Performance Goal 4.1.2**

<b>Fiscal Year</b>	<b>Goal Statement and Target</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	<p>Within OGM, develop and implement formal procedures and Internal Controls prescribing effective and efficient support of the Board’s mission.</p> <p>Target: Percentage completion of significant OGM work processes with effective procedures.<sup>1</sup></p> <p><sup>1</sup> Note this target has been clarified from the target published in the FY 2014 APR</p>	33% Complete	<p>Not achieved</p> <p>32% Complete</p>
<b>Actual Results for Preceding Fiscal Years</b>			
	NA (new goal in FY 2014)		

## Discussion

The Board's Internal Control Program Operating Procedures identify twenty-five (25) significant work processes within OGM. The following ten (10) work processes received internal control assessments in FY 2014 and were reviewed by the Board's Executive Committee on Internal Control (ECIC).

Time and Attendance	Drug Free Workplace
Employee Relations	Equal Employment Opportunity
Transportation Fringe Benefits Program	Purchase Card Program
Travel Charge Card Program	Classified Document Program
Records Management Program	Security Clearance Program

Eight of these processes or 32% of all OGM work processes (i.e., 8 of 25) were assessed by the ECIC as having effective internal controls. Equal Employment Opportunity and Records Management Program require enhanced procedures.

### Information on Unmet Target

Vacancies in key OGM management areas for much of FY 2014 were a major reason the goal was not achieved. Although progress has been made for both programs, certain actions remain to be implemented as of the end of the fiscal year. Drafting of updated procedures under the Equal Employment Opportunity program has begun, and approval of those procedures is targeted by the 3<sup>rd</sup> quarter of FY 2015.

The Board has entered into an Interagency Agreement with the National Archives and Record Administration for an assessment of its records management program. The assessment is scheduled to be completed in the 1<sup>st</sup> quarter of FY 2015. Based on the assessment, the Board will develop a corrective action plan for implementation during FY 2015.

### Performance Goal 4.1.3

Fiscal Year	Goal Statement and Target	Target Measure, Milestone, or Deliverable	Result
2014	<p>Within OGC, develop and implement formal procedures and Internal Controls prescribing effective and efficient support of the Board's mission.</p> <p>Target: Percentage completion of new procedures.</p>	40% Complete	<p>Not Achieved</p> <p>21% Complete</p>
<b>Actual Results for Preceding Fiscal Years</b>			
	NA (new goal in FY 2014)		

## Discussion

To meet its goal, OGC needed to identify and prioritize OGC internal control activities and develop and implement formal procedures and internal controls or update existing internal controls. OGC identified 14 activities, and 40% completion would have equated to six procedures. OGC completed three: reviewing, updating, and publishing corrections to the Board's Government in the Sunshine Act rule; publishing the second notice of the Board's proposed rule concerning procedures for safety investigations; and reviewing the Board's rule regarding testimony by employees and production of official records in legal proceedings.

### Information on Unmet Target

Reviews of three other activities were conducted, but not completed as of the end of the year. OGC expended unanticipated assets and time responding to a Government Accountability Office audit that had a broader scope than originally expected; leading efforts to identify an IG and then respond to the designation of NRC's IG as the Board's IG; working with the Office of Government Ethics and the Senate Armed Services Committee on three Board Member nominations and one confirmation; and assisting in the development, legal examination and explication, and implementation of new Board and staff procedures. Vacancy in a key OGC management area for much of FY 2014 also contributed to the reasons the goal was not achieved.

**Strategic Objective 4.2 — Improve the alignment of human capital strategies with agency mission, goals, and objectives through analysis, planning, investment, measurement, and management of human capital programs.**

### Performance Goal 4.2.1

<b>Fiscal Year</b>	<b>Goal Statement</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	Achieve a more results-oriented performance culture.	Develop a revised GS performance management system to ensure higher standards and employee accountability by August 31, 2014.	Ongoing
<b>Actual Results for Preceding Fiscal Years</b>			
	NA (new goal in FY 2014)		

## Discussion

The Division of Human Resources (DHR) has developed a revised General Schedule (GS) performance management system that adheres to the requirements in the Office of Personnel Management's (OPM) Performance Appraisal Assessment Tool (PAAT). PAAT helps federal agencies develop and implement effective appraisal programs that are fair, credible, and transparent. The development of a GS performance management system using PAAT not only helps ensure a

result-oriented performance culture at the Board, it will also help support the Board’s FY 2015 goal of attaining OPM certification of the SES performance appraisal system.

**Information on Unmet Target**

The revised GS performance management system is currently in draft form and will be shared with Board Members and managers in the 1<sup>st</sup> quarter of FY 2015. Employees will be given an opportunity to provide feedback in the 2<sup>nd</sup> quarter. OPM approval will be obtained during the 2<sup>nd</sup> quarter and current policies and operating procedures will be revised, accordingly, in preparation for rolling out the revised system for the performance year beginning on July 1, 2015.

The revised system ties all performance standards to the strategic goals of the Board, embeds accountability into each employee’s performance plan, and includes defined standards that give employees and managers a roadmap for performance expectations at each level.

**Performance Goal 4.2.2**

<b>Fiscal Year</b>	<b>Goal Statement</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	Address human capital gaps identified in critical mission functions.	Critical mission functions are defined within each position (entry-, mid-, and senior-career level) by June 30, 2014.	Achieved
<b>Actual Results for Preceding Fiscal Years</b>			
	NA (new goal in FY 2014)		

**Discussion**

DHR, with input from OTD and OGC, defined the mission critical functions within each of the Board offices. Additionally, generic core competencies have been developed for entry-level, mid-career, and senior-level positions and technical competencies have been drafted for the chemical, electrical, mechanical, and civil/structural engineering functions.

In FY 2015, additional technical competencies will be developed and vetted. Once this process is complete, the data will be migrated to an electronic workforce planning tool that will allow the Board to identify gaps in core competencies and adjust its recruitment and development plans accordingly.

**Strategic Objective 4.3: Improve and sustain effective, transparent two-way communications between the Board and its stakeholders on safety issues in DOE’s defense nuclear complex and on the Board’s operations.**

**Performance Goal 4.3.1**

<b>Fiscal Year</b>	<b>Goal Statement and Target</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	<p>Provide timely communications of safety observations obtained through direct oversight and maintaining cognizance of nuclear facilities at DOE’s nuclear weapons sites.</p> <p>Target: Percentage of Site Representative Weekly reports documenting direct oversight posted to the Board’s public webpage within 35 days of the date of the report.</p>	80%	<p>Achieved</p> <p>88% posted within 35 days</p>
<b>Actual Results for Preceding Fiscal Years</b>			
	N/A (New goal in FY 2014)		

**Discussion:**

The Board provided timely communications of safety observations obtained through direct oversight and maintaining cognizance of nuclear facilities at DOE’s nuclear weapons sites by posting its Site Representative Weekly reports to the Board’s public webpage within 35 days of the date of the report. Of 260 Site Representative Weekly reports, the Board posted 229 to its public webpage within 35 days of the date of the report for an overall percentage of 88%.

**Performance Goal 4.3.2**

<b>Fiscal Year</b>	<b>Goal Statement and Target</b>	<b>Target Measure, Milestone, or Deliverable</b>	<b>Result</b>
2014	<p>Inform the Congress and other stakeholders of potential safety issues early in the design and construction phases of DOE defense nuclear facilities.</p> <p>Target: Number of <i>Reports to Congress on the Status of Significant Unresolved Technical Differences between the Board and the Department of Energy on Issues Concerning the Design and</i></p>	3 reports	<p>3 reports submitted to Congress</p> <p>Achieved</p>

	<i>Construction of DOE's Defense Nuclear Facilities</i> published and submitted to Congress.		
Actual Results for Preceding Fiscal Years			
2013		N/A	2
2012		N/A	2
2011		N/A	3
2010		N/A	3

**Discussion:**

The Board published three reports during FY 2014 and submitted them to Congress in December 2013, May 2014, and September 2014. In the September 2014 report, the Board informed Congress that it henceforth will produce the reports semiannually. The FY 2015 and 2016 targets have been further modified to reduce the minimum number of reports to one per year, and to count for purposes of meeting this goal the inclusion of this subject matter within the Board's annual report to Congress. New issues will continue to be identified promptly by Board correspondence to DOE and by posting the correspondence on the Board's public website.

**Performance Goal 4.3.3**

Fiscal Year	Goal Statement and Target	Target Measure, Milestone, or Deliverable	Result
2014	Effectively communicate safety issues by conducting public hearings in communities near DOE defense nuclear facilities and in Washington, DC.  Target: Number of public hearings.	3 public hearings	3 public hearings  Achieved
Actual Results for Preceding Fiscal Years			
2013		N/A	2
2012		N/A	3
2011		N/A	4
2010		N/A	2

**Discussion:**

The Board held three public meetings in FY 2014, satisfying its target. The Board held its first public hearing and meeting of the fiscal year on *Safety in Design, Operations, and Emergency Preparedness at the Y-12 National Security Complex*, on December 10, 2013, in Knoxville, Tennessee. The Board held its second public hearing and meeting on May 28, 2014, in Washington, DC, on *Safety Culture and Board Recommendation 2011-1*. The Board convened its third public hearing and meeting, the second regarding *Safety Culture and Board Recommendation 2011-1*, in Washington, DC, on August 27, 2014.

**PERFORMANCE GOAL 1:  
SAFE NUCLEAR WEAPONS OPERATIONS**

<b>Performance Goal 1</b>	<u><b>Safe Nuclear Weapons Operations.</b></u> DOE operations that directly support the nuclear stockpile and defense nuclear research are conducted in a manner that ensures adequate protection of the health and safety of the public, the workers, and the environment.
<b>FY 2013 Performance Accomplishments</b>	
<p><b>LANL Plutonium Facility Seismic Vulnerabilities.</b> DOE, in its September 2012 response to the Board’s July 18, 2012 letter committed to conduct an alternate nonlinear seismic analysis of the plutonium facility. The Board’s staff has closely observed this substantial effort since its start in October 2012. Completion of this analysis is a critical step in determining the risk associated with a post-seismic collapse and fire accident scenario. The Board’s July 17, 2013 letter emphasized the importance of the analysis and requested a schedule that supports timely completion.</p> <p><b>Safety Basis at the LANL Plutonium Facility.</b> Following identification of new collapse mechanisms at the Plutonium Facility, DOE directed the LANL contractor to develop a Safety Basis Addendum to justify continued operations. The Board issued its January 3, 2013 letter urging DOE to consider additional compensatory measures including reduction of nuclear material inventory, robust containerization and increased emphasis on emergency preparedness. DOE issued the Addendum and responded to the Board on March 27, 2013, reporting that the Secretary of Energy’s review of consequence and frequency indicated it was safe to continue operations. The Board reported that it could not reach this conclusion until the above mentioned alternate seismic analysis was complete.</p> <p><b>Nuclear Criticality Safety at LANL.</b> In a July 15, 2013 letter to NNSA, the Board expressed concern with long-standing issues associated with LANL’s implementation of its Criticality Safety Program. Concerns include: a significant shortage of contractor criticality safety staff that has hindered their ability to address criticality deficiencies; most criticality safety controls are not incorporated into operating procedures; operators typically do not utilize written procedures when performing work; fissile material labels do not list parameters relevant to criticality safety (e.g., mass); some fissile material operations lack criticality safety evaluations (CSE); and some CSEs do not analyze all credible abnormal conditions. Most fissile material operations in the Plutonium Facility have been paused since June 27, 2013. In response to the Board letter, NNSA briefed the Board on September 24, 2013, and intends to release an approved resumption plan prior to restarting full operations with fissile materials.</p> <p><b>Continued Operations of Y-12 Aging Infrastructure.</b> In a letter to NNSA dated March 13, 2007, the Board identified concerns regarding NNSA’s ability to safely operate the 9212 Complex for an extended period of time and established an annual reporting requirement to evaluate the physical condition of the building’s systems, structures, and components. In February 2012, NNSA deferred transition of the operations in Buildings 9215 and 9204-2E from the scope of the planned Uranium Capabilities Replacement Project. Given this change, the Board emphasized the need for NNSA and the Y-12 contractor to more vigilantly monitor the condition of these facilities during the October 2, 2012, Public Hearing in Knoxville. On August 26, 2013, NNSA briefed the Board on the Continued Safe Operations Oversight Team’s review, which was expanded this year to incorporate Buildings 9215 and 9204-2E.</p> <p><b>Y-12 Training and Qualification Program.</b> In a letter to NNSA dated June 5, 2012, the Board identified numerous areas for improvement related to the Y-12 Training and Qualification Program. During FY 2013, the Y-12 contractor took action to address the Board’s concerns by formalizing a continuing training strategy within its production organization and making improvements to its systematic approach to training. The staff provided feedback to the Y-12 contractor regarding this strategy and continues to actively track progress towards implementing the new training program.</p> <p><b>Y-12 Work Planning and Control.</b> In a letter to NNSA dated December 29, 2011, the Board identified concerns with the planning, control, execution, and oversight of work at Y-12. The Y-12 contractor briefed the Board on April 24, 2013, regarding an independent contractor assessment of the effectiveness of corrective actions taken through the comprehensive Work Planning and Control Performance Improvement Plan. A number of weaknesses continue to persist and the Y-12 contractor committed to actions to sustain key initiatives and further improve in this area.</p> <p><b>Pantex Emergency Preparedness.</b> In October 2012, members of the Board’s staff conducted a review of the Pantex emergency preparedness program, observed an emergency exercise, and provided immediate feedback regarding a lack of personnel training and the adequacy of exercises and drills. On March 14, 2013, the Board</p>	

conducted a public meeting and hearing in Amarillo, Texas, that included discussions of the weaknesses in the program. As a result, NNSA recognized the weaknesses and initiated corrective actions for the emergency preparedness program at the Pantex Plant.

**Pantex Fire Protection.** On February 25, 2013, the Board issued a letter to NNSA documenting its concern regarding maintenance and operation issues with the fire protection systems at Pantex. NNSA responded by taking immediate actions to address issues with the fire suppression systems and maintenance procedures and committed to prioritizing long-term improvements to the fire protection system.

**Pantex Probabilistic Seismic Hazard Analysis (PSHA) Update.** Beginning in August 2012, and throughout FY 2013, members of the Board's staff reviewed the seismic qualifications of the Pantex site and noted a lack of compliance with DOE Order 420.1B, *Facility Safety*; specifically the requirement to evaluate the need to update the site seismic hazard analysis every ten years. NNSA and its contractor responded by publishing plans to address the seismic hazard at Pantex and updating the seismic source characterization model.

**Pantex Documented Safety Analysis.** On January 28, 2013, the Board received a briefing by NNSA regarding its continuing efforts to bring the Pantex documented safety analysis (DSA) into compliance with NNSA directives. Particular shortcomings were originally documented in a Board letter issued July 2, 2010. The Board reviewed the new plan and implementation efforts presented by NNSA and provided immediate feedback. NNSA utilized the Board's input and published an updated DSA Improvement Plan, which was published in July 2013.

**Pantex Safety Culture.** On March 2, 2012, the Board issued a letter describing major shortcomings in the Pantex safety culture that led to operations being performed that exceeded the approved nuclear explosive safety boundaries. NNSA initiated multiple efforts to address this significant concern including a B&W Pantex investigation of the nuclear explosive safety change evaluation process, an NNSA assessment of the same process, and an HSS investigation of Pantex safety culture. The Board further investigated how its concerns were being addressed at a public meeting and hearing held on March 14, 2013. NNSA is continuing to take corrective actions to increase safety of nuclear explosive operations and, in particular, to improve communication between management and workers.

**Nuclear Explosive Safety (NES) at Pantex.** The Board's staff observed several NES evaluations and raised a number of key issues:

- NNSA has allowed ongoing nuclear explosive operations to continue without correcting or mitigating critical safety concerns raised by these evaluations.
- NNSA does not provide adequate staffing levels of qualified federal personnel needed to conduct these evaluations.
- NNSA does not ensure that these evaluations are revalidated as required by the directives.

These and other issues were the subject of a Board public hearing in March 2013 in Amarillo, Texas. During the preparation phase for this public hearing, NNSA restructured the nuclear explosive safety program to address many of the concerns that had been raised informally via technical interchanges between the Board's staff and the NNSA staff. The Board received assurances from NNSA that these changes would improve the visibility and the independence of the current process and should lead to improvements in all of these areas.

**LLNL Safety Basis Processes.** On August 30, 2012, the Board issued a letter expressing concern that there were systemic deficiencies in the development, review, and approval of safety control strategies at LLNL. In response to the Board's letter, NNSA and the contractor each conducted an independent, external review of their respective nuclear safety basis processes during FY 2013. The Board evaluated the results of these reviews and will assess the effectiveness of the associated corrective actions as part of the Board's oversight process.

**LLNL Waste Storage Facilities Safety Basis.** A review team from the Board's staff assessed the LLNL Waste Storage Facilities Documented Safety Analysis for compliance with DOE Standards and noted a number of deficiencies and errors within the analysis. The staff review team communicated these deficiencies to the Livermore Field Office, which then directed the contractor to formally resolve the staff comments. One of the identified deficiencies led the LLNL contractor to declare that a potential inadequacy in the safety analysis existed. The contractor is working to address the staff review team comments. The staff is planning a follow up review of the Waste Storage Facilities Safety Basis once the contractor has completed updating the analysis.



**NNSS National Criticality Experiments Research Center (NCERC)—Safety Basis and Instrumentation and Control.** The Board’s staff continued to evaluate NNSA’s efforts to improve operations at NCERC—efforts that NNSA began in response to a Board letter dated August 5, 2010. Areas of concern included the adequacy of the safety analysis, classification of controls, and the reliability of instrumentation and control systems. In response, NNSA identified corrective actions for each of the Board’s concerns and in FY 2013, NNSA implemented several improvements to the safety analysis and controls at NCERC.

**NNSS Device Assembly Facility (DAF) Fire Suppression System.** The Board and its staff have long noted deficiencies in the DAF fire suppression system that should be corrected before beginning more hazardous operations. In response, NNSA initiated a project to assess the condition of the system, analyze and prioritize needed improvements, develop improvement options, and begin improvements to the system. In FY 2013, NNSA approved a new comprehensive project plan that should address the full scope of the deficiencies.

**Fire Protection and Life Safety for Subcritical Experiments at NNSS.** The Board’s staff reviewed plans and improvements to fire protection and life safety in the underground tunnel complex for subcritical experiments at NNSS. As a result of staff-to-staff interactions, NNSA identified more appropriate requirements for safety and health in underground facilities at NNSS.

**Performance Goal 1**

**Safe Nuclear Weapons Operations.** DOE operations that directly support the nuclear stockpile and defense nuclear research are conducted in a manner that ensures adequate protection of the health and safety of the public, the workers, and the environment.

**FY 2012 Performance Accomplishments**

**Safety Basis and Controls at LANL.** The Board identified concerns with the quality and timeliness of the safety basis update process across the laboratory during its public hearing held in Santa Fe, NM, in November 2011. Based on reviews of updates to both the Plutonium Facility Documented Safety Basis and the Area G Basis for Interim Operations, the Board issued a letter June 18, 2012, outlining its concerns with the safety basis for the Plutonium Facility. DOE is working to address the deficiencies identified by the Board.

**LANL Plutonium Facility Confinement Ventilation.** DOE's Implementation Plan for the Board's Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety*, committed to provide seismically qualified fire suppression and active confinement ventilation systems. DOE has committed to provide a Project Execution Plan that describes its plan to implement these improvements by November 2012.

**LANL Plutonium Facility Seismic Vulnerabilities.** An update to the Probabilistic Seismic Hazards Analysis for the laboratory issued in 2007 indicated that the likelihood of high seismic ground motion (particularly in the vertical direction) was much greater than previously believed. Further analysis identified nine facility vulnerabilities that could lead to loss of building confinement or structural collapse. NNSA completed physical upgrades to address these new vulnerabilities. The Board noted additional vulnerabilities and continued working with NNSA personnel as they conducted a static nonlinear analysis of the facility. The Board communicated its concerns with technical basis and acceptance criteria for this analysis in a July 18, 2012, letter. NNSA subsequently provided the Board with the initial results of this analysis, which identified more structural weaknesses in the building. On September 28, 2012, the Deputy Secretary of Energy replied to the Board's July 18 letter, committing to further analyses and continued cooperation with the Board.

**Nuclear Criticality Safety at LANL.** In August 2011, a significant violation of nuclear criticality safety requirements occurred at the Plutonium Facility. The Board evaluated the corrective action plan, its adequacy, and its applicability to other LANL facilities. Nuclear criticality safety concerns also arose in May 2012, at Technical Area 35 regarding the inventory and control of special nuclear materials. The Board has closely followed NNSA's involvement in this area, including observation of a Nuclear Criticality Safety Group assessment at LANL in February 2012.

**Emergency Preparedness at LANL.** The Board conducted a review of Emergency Preparedness in October 2011, and emphasized several weaknesses during its public hearing at Santa Fe in November 2011. Of particular concern were the wildland fire mitigation program and LANL's preparations to confront site-wide or cascading natural phenomena events. LANL responded with increased effort and has initiated an exercise program focused on these kinds of accident scenarios.

**Nuclear Explosive Safety at Pantex.** The Board issued a letter on November 7, 2011, detailing concerns on how NNSA addresses nuclear explosive safety issues that are identified during studies of proposed and ongoing nuclear explosive operations. NNSA has committed to improving the management review of findings and documenting the technical justification for not addressing findings prior to beginning or continuing operations.

Additionally, the Board issued a letter on March 2, 2012, documenting concerns with the effectiveness of the nuclear explosive safety program at the Pantex Plant. NNSA took immediate action to change the Pantex management structure to prevent conflicts of interest between nuclear explosive safety and production. NNSA and DOE's Office of Health, Safety and Security are also conducting reviews of the safety culture at Pantex.

**Pantex Hazard Analysis Reports.** In April 2011, NNSA approved the Pantex Documented Safety Analysis Upgrade Initiative which will bring Pantex Hazard Analysis Reports into compliance with the applicable DOE directives. In October 2011, the first safety analysis document was drafted with the intent of meeting the upgraded requirements. In December 2011, the Board presented NNSA with concerns and comments regarding this draft document; NNSA is currently making revisions.

**Implementation of DOE Standard 3016, Hazard Analysis Reports for Nuclear Explosive Operations.** During FY 2012, the Board followed up on its April 5, 2011, letter to NNSA that identified shortcomings with NNSA oversight

of the development and documentation of weapon response (an input to the safety basis for the explosive operations at the Pantex Plant in accordance with DOE Standard 3016. In response to the Board's letter, NNSA managers committed to evaluate implementation of the standard at each of the three weapon design agencies. The Board observed all of these reviews, the last of which was conducted in August 2012. The preliminary findings and weaknesses identified by the NNSA team are consistent with the concerns raised in the Board's letter. The NNSA review team will develop a final report and recommend corrective actions during FY 2013.

**Pantex Chemical Control Program.** In December 2011, the Board conducted an onsite review of the Pantex chemical control program and identified concerns with the categorization of hazardous chemicals and the technical basis of methods used for dispersion calculations. These concerns were transmitted to NNSA through staff to staff teleconferences and are being addressed.

**Pantex Conduct of Operations and Technical Procedures.** In February 2012, the Board conducted a review of the conduct of nuclear explosive operations at Pantex and provided immediate feedback to NNSA on areas for improvement. NNSA issued an updated Writer's Guide for technical procedures in March 2012; implementation of this guide has begun. The issues leading to improvements in the Writer's Guide and technical procedures were originally documented in a Board letter dated October 15, 2009.

**Pantex Technical Safety Requirements Calculations.** The Board issued a letter on March 2, 2012, documenting its review of the technical information and calculations Pantex used to develop its Technical Safety Requirements. The Board discussed a number of discrepancies with NNSA, and NNSA is taking action to address the concerns.

**Pantex Fire Protection System.** In July 2012, the Board conducted a review of the Pantex Fire Protection system and provided feedback NNSA on several areas for improvement.

**Pantex Hazard Analysis Task Teams.** In August 2011, the Board conducted a review of the operation of Hazard Analysis Task Teams at Pantex which are used to identify hazards, develop safety controls, and complete the Hazard Analysis Reports for nuclear explosive operations. NNSA has committed to reviewing its processes and documenting them through its Requirements Modernization and Integration initiative.

**Highly Enriched Uranium Materials Facility (HEUMF) Safety Analysis.** In response to the Board's letter to DOE dated April 20, 2011, the Y-12 contractor re-incorporated the analysis of chemical and toxicological hazards into the facility safety basis in June 2012.

**Y-12 Work Planning, Conduct of Operations, and Procedures.** The Board continued to evaluate actions in response to its letter to DOE dated August 19, 2011, that identified concerns regarding the Y-12 contractor's failure to adhere to conduct of operations principles during nuclear operations and inconsistencies in the quality of operating procedures. During this fiscal year, the Y-12 contractor implemented a comprehensive Conduct of Operations Improvement Plan and significantly improved the quality of technical procedures and operator adherence to these procedures. Additionally, NNSA evaluated the effectiveness of the Y-12 contractor's corrective actions and briefed the Board on the improvements to date.

In a letter to DOE dated December 29, 2011, the Board identified concerns with the planning, control, execution, and oversight of work at Y-12. The Y-12 contractor identified corrective actions to address the Board's concerns, which are being implemented through execution of a comprehensive Work Planning and Control Performance Improvement Plan, and have led to improvements in the content and format of work packages and added management attention on work planning activities. DOE and the contractor performed assessments of the effectiveness of these actions and noted improvements, but concluded that continued attention by DOE and contractor management is required to ensure improvements continue to mature and are consistently implemented.

**Y-12 Fire Protection.** The Board identified concerns related to the Y-12 contractor's decision to test aged sprinkler heads in defense nuclear facilities rather than replace them when the 50-year operating lifetime was exceeded. As a result, the Y-12 contractor decided to adopt an appropriately conservative approach and began replacing the aged sprinkler heads in 2012, improving the safety posture of the Y-12 facilities.

**Y-12 Training and Qualification Program.** In a letter to NNSA dated June 5, 2012, the Board identified numerous areas for improvement related to the Y-12 Training and Qualification Program. The Y-12 contractor has taken action to improve the content of several training courses to improve operator performance for nuclear operations, and has committed to a more comprehensive plan with additional corrective actions by November 1, 2012.

**Continued Operations of the 9212 Complex at Y-12.** In a letter to DOE dated March 13, 2007, the Board identified concerns regarding NNSA's ability to safely operate the 9212 Complex for an extended period of time and established an annual reporting requirement to evaluate the physical condition of the building's systems, structures, and components. On July 24, 2012, DOE briefed the Board on the Continued Safe Operations Oversight Team's review, which fulfilled the annual reporting requirement. The Board continues to track the safety of operations in the 9212 Complex and advocate for necessary maintenance and repairs until these operations can be transferred to the planned Uranium Capabilities Replacement Project.

**LLNL Safety Basis Development, Review, and Approval.** On March 29, 2011, the Board issued a letter expressing concern over the changes proposed in the contractor's annual update to the Tritium Facility safety basis, particularly with the selection of credited controls. The Board has further reviewed recent updates to the Plutonium Facility safety basis and is concerned that there is a trend toward decreasing rigor and conservatism in the development, review, and approval of important safety basis documents. The Board conveyed these concerns to NNSA in a letter dated August 30, 2012, and will monitor the response and any improvements in the safety basis process.

**Safety System Design, Functionality, and Maintenance at LLNL.** The Board issued a letter on December 13, 2011, which questioned the ability of two Plutonium Facility safety systems—wooden high-efficiency particulate air filter enclosures and the fire detection and alarm system—to perform their defined safety functions under all operating conditions. As a result, the laboratory is reviewing options for replacing the wooden enclosures, has made software improvements to the fire detection system to increase its reliability in some conditions, and is addressing the Board's concerns with additional Plutonium Facility systems (e.g., Hydrogen Gas Control System and Glovebox Exhaust System).

**NNSS National Criticality Experiments Research Center (NCERC)—Safety Basis and Instrumentation and Control.** In 2010 and 2011, the Board evaluated NNSS's readiness to begin operations at NCERC. In an August 5, 2010, letter to NNSA, the Board identified concerns with the safety analysis, classification of controls, and the reliability of instrumentation and control systems. In response, NNSA identified corrective actions for each of the Board's concerns that contributed to the safe startup of NCERC. In FY 2012, NNSA implemented compensatory measures for the start-up of critical assembly machines and experiments.

**Readiness to Dispose of a Damaged Nuclear Weapon or Improvised Device at NNSS.** For several years, NNSA completed life safety and tunnel infrastructure improvements and developed a plan for implementation of safety controls and upgrades for the facility at NNSS (G-Tunnel) that would be used in disposition of an improvised nuclear device. In FY 2012, NNSA abandoned G-Tunnel due to structural stability concerns. NNSA moved the planned location for such operations to a newer, more stable, and safer tunnel.

**Formality of Operations for Subcritical Experiments at NNSS.** The Board reviewed improvements to several safety management programs at NNSS nuclear facilities related to previous concerns with formality of operations. As a result of interactions with the Board through 2012, NNSA implemented compensatory measures to improve the conduct of operations, work planning, and configuration of safety systems at nuclear facilities at NNSS.

**Annular Core Research Reactor at SNL.** In letters to NNSA dated February 28, 2012, and April 18, 2012, the Board identified issues with the safety analysis, the reliability of some safety systems, and quality assurance (including software quality assurance) for the Annular Core Research Reactor. In response, NNSA and SNL established compensatory measures to limit material at risk, evaluated the Board's issues, and developed an improvement plan.

**Performance Goal 1**

**Safe Nuclear Weapons Operations.** DOE operations that directly support the nuclear stockpile and defense nuclear research are conducted in a manner that ensures adequate protection of the health and safety of the public, the workers, and the environment.

**FY 2011 Performance Accomplishments**

**Safety of Continued Operation of the LANL Chemistry and Metallurgy Research Facility.** In response to Board letters dated October 23, 2007, and May 16, 2008, which questioned DOE’s decision to operate the 55-year-old Chemistry and Metallurgy Research facility an estimated six years past the previously planned shutdown date of 2010, LANL agreed to limit the radioactive material-at-risk in the facility to reduce the design basis accident consequence to below the Evaluation Guideline.

**Integrated Nuclear Planning at LANL.** The Board identified that DOE had not demonstrated formal mechanisms to ensure that design requirements and interfaces for pit manufacturing at LANL were appropriately managed and controlled across the suite of projects that contribute to the future plutonium processing infrastructure. In response, DOE developed an Integrated Nuclear Planning process to improve coordination among its projects as national security mission requirements are refined. The Board has continued to participate in these Integrated Nuclear Planning workshops, including two this fiscal year. This process continues to be effective.

**Transuranic Waste Operations at LANL.** In a letter dated January 18, 2007, the Board urged NNSA to promptly develop a viable pathway for shipping high-activity transuranic waste drums from LANL to the Waste Isolation Pilot Plant for disposal. In response, DOE has bolstered waste disposition work at LANL by facility infrastructure upgrades, new safety basis documents, and training and qualification of operators. During FY 2011, the Board evaluated LANL’s preparations to re-establish the capability to vent waste drums potentially containing flammable gases.

**LANL Material Disposition Area-B.** The Board’s oversight of an American Recovery and Reinvestment Act activity to de-inventory the open pit disposal area at LANL’s Technical Area-21 is nearly complete. Ninety-eight percent of the waste has been uncovered and packaged for disposal. Sixty-five percent has been shipped off site to disposal.

**LANL Plutonium Facility Confinement Ventilation.** As part of DOE’s implementation plan for the Board’s Recommendation 2004-2, *Active Confinement Systems*, NNSA and its contractor evaluated the facility’s confinement strategy in parallel with an effort to develop a new safety basis for the facility. In its June 16, 2009, report to the Board, NNSA asserted that some modifications identified as needed in the confinement ventilation evaluation may not be needed to meet the overall safety strategy and goals under the final approved documented safety analysis. As a result, the Board issued Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety*, on October 26, 2009, to which DOE responded with an Implementation Plan on July 13, 2010. The Board is closely following the implementation of near-term improvements in the facility’s safety posture and NNSA’s development of a strategy for long-term improvements in the facility’s safety systems.

**LANL Plutonium Facility Seismic Vulnerabilities.** In 2007, the Probabilistic Seismic Hazards Analysis was updated indicating that the likelihood of high seismic ground motion (particularly in the vertical direction) was much greater than previously believed. Analysis identified nine facility vulnerabilities that could lead to loss of building confinement or structural collapse. In response, LANL declared a Potential Inadequacy of the Safety Analysis and submitted a Justification for Continued Operations that was approved by the NNSA site office in July 2011. LANL and NNSA are aggressively pursuing physical upgrades to address these new vulnerabilities. The Board believes additional vulnerabilities exist and is working with LANL and NNSA to ensure they are adequately addressed.

**LANL Weapons Engineering Tritium Facility.** In October 2008, LANL ceased operations at the tritium facility due to a Technical Safety Requirement violation and problems with the pressure safety program. These issues were initially identified by a Board review in July 2007 and communicated to DOE by letter on October 16, 2007. To comply with the facility’s safety basis, the laboratory made changes to the piping system, pressure relief components, and the facility’s pressure safety procedures. The Board carefully tracked these changes and questioned the laboratory’s plan (viewed as acceptable by the NNSA site office) to restart operations without a formal readiness review. As a result, NNSA headquarter held discussions with its site offices and the laboratory, ultimately resulting in the decision to perform formal contractor and federal Operational Readiness Reviews. LANL divided the restart into three phases. The Phase I readiness review authorizing low pressure operations was successfully completed in June 2010. The remaining phases were completed in FY 2011.

**Nuclear Criticality Safety at LANL.** In a September 10, 2007, letter to NNSA, the Board expressed concern that a software tool (MASS) was being relied upon by operators as a control to ensure compliance with criticality safety limits without appropriate software quality assurance. LANL took actions to strengthen the safety posture, and the schedule for bringing the nuclear criticality safety program into full compliance with industry standards and DOE directives appears acceptable. LANL began implementing a new software tool (MARTracker) in FY 2010. The Board anticipates greater oversight and involvement in FY 2012, including reviewing progress on criticality safety programmatic improvements and software upgrades.

**Nuclear Explosive Safety.** The Board evaluated 8 Nuclear Explosive Safety Studies and change evaluations conducted at Pantex during FY 2011, including the B53 dismantlement Nuclear Explosive Safety Study and the B61 and W87 Operational Safety Reviews.

**Quality of Safety-Related Information for Nuclear Explosive Operations.** In FY 2011, the Board completed a comprehensive review of the design laboratories' implementation of DOE Standard 3016, *Hazard Analysis Reports for Nuclear Explosive Operations*, and issued a letter on April 5, 2011, informing DOE that the standard had not been adequately implemented and that the technical information used by the laboratories could not be verified to be technically accurate. NNSA is in the process of responding to the Board's concerns.

**Pantex Procedures.** In 2009, the Board completed a series of onsite reviews and provided immediate feedback to Pantex on areas where improvements could be made in nuclear explosive operating procedures. On October 15, 2009, the Board issued a letter detailing shortcomings in the process for developing and implementing technical procedures at Pantex. In 2011, the Board continued observation of Pantex nuclear operations, providing feedback on shortcomings of procedures. In response to Board concerns, Pantex corrected implementation of immediate action procedures and is working on upgrades to the Writer's Guide for procedures.

**Pantex Hazard Analysis Task Teams.** In August 2011, the Board conducted a review of the operation of Hazard Analysis Task Teams at Pantex which are used to identify hazards, develop safety, and complete the Hazard Analysis Reports for nuclear explosive operations. NNSA has committed to reviewing its processes and documenting them through its Requirements Modernization and Integration initiative.

**Pantex Hazard Analysis Reports.** The Board issued a letter on July 6, 2010, detailing specific issues concerning Pantex's compliance with DOE Standard 3016 in developing Hazard Analysis Reports and establishing sufficient controls. On April 28, 2011, NNSA issued guidance for use of the standard. In March 2011, the Board participated in a workshop with NNSA to update guidance for the Pantex Documented Safety Analysis Upgrade Initiative which will bring Pantex Hazard Analysis Reports into compliance with the applicable DOE directives.

**Pantex Technical Safety Requirements Calculations.** The Board reviewed the technical information and calculations Pantex used to develop its Technical Safety Requirements. The Board discussed a number of discrepancies with NNSA, and NNSA is taking action to address the concerns.

**Y-12 Non-Material Access Area Storage.** In a letter to DOE dated February 4, 2011, the Board raised questions regarding the safety issues that were considered and the rationale used to evaluate the proposed new mission for an aging structure, Building 9720-5, to be used for storage of enriched uranium and other materials. Through subsequent interactions, the Y-12 contractor committed to (a) reduce combustible loading in the facility by over packing wooden containers of depleted uranium over the next four years and (b) conduct a programmatic and safety evaluation five years after material consolidation is complete.

**Highly Enriched Uranium Materials Facility Safety Analysis.** In a letter to DOE dated April 20, 2011, the Board raised concerns regarding the elimination of chemical and toxicological hazards from the safety analysis for the Highly Enriched Uranium Materials Facility (HEUMF). After several interactions and a briefing to the Board, NNSA directed the Y-12 contractor to ensure all non-radiological hazards are evaluated and appropriate controls are identified in the Documented Safety Analyses for both HEUMF and the Uranium Processing Facility (UPF). The Board also identified concerns regarding the basis for the potential downgrading of some safety related controls in HEUMF, specifically the lack of bounding analysis for certain fire scenarios. DOE subsequently directed the Y-12 contractor to provide more detailed analyses for fire scenarios.

**Special Material Capability Glovebox Project at Y-12.** The Board observed the contractor Readiness Assessment for startup of the new Special Material Capability Glovebox Project. The assessment was thorough, and the facility demonstrated readiness to operate the new glovebox. However, the Board was concerned that issues identified in the

area of conduct of operations were likely not limited to operation of the new glovebox, and could indicate facility or site-wide weaknesses. The Board conducted a review of Y-12 technical procedures and conduct of operations in April 2011 to evaluate this concern.

**Conduct of Operations at Y-12.** In a letter to DOE dated August 19, 2011, the Board identified concerns regarding the Y-12 contractor's failure to adhere to conduct of operations principles during some nuclear operations and inconsistencies in the quality of some operating procedures. The Y-12 contractor has since identified several corrective actions to address the Board's concerns, which are being implemented through execution of a comprehensive Conduct of Operations Improvement Plan. In its letter, the Board requested that DOE provide a report in six months that evaluates the effectiveness of these corrective actions.

**Y-12 Fire Protection.** Following a component failure, the Board identified concerns regarding the operability of the HEUMF fire suppression system. Through subsequent discussions, DOE and the Y-12 contractor identified numerous lessons learned, which will improve the availability and reliability of vital safety systems at Y-12 once implemented. The Board has also initiated interactions with Y-12 regarding testing to determine operability of aged sprinkler systems in other facilities.

**Y-12 Nuclear Criticality Safety.** The Board continued to evaluate actions taken in response to the Board's January 23, 2009, letter to NNSA, which raised concern over the adequacy of some criticality safety evaluations. The Y-12 contractor has since implemented a Criticality Safety Program Improvement Plan and upgraded several of its Criticality Safety Evaluations. These actions address weaknesses in both programmatic processes and documentation.

**Y-12 Activity-Level Work Planning.** The Board conducted a review of Y-12 activity-level work planning and control in August 2011. This review followed a 2008 review, the results of which were transmitted to DOE in a letter dated January 22, 2009. Final results of this follow-on review are pending, but preliminary concerns have been identified with the planning, control, execution, and oversight of work, similar to the issues identified in 2008. Y-12 issued several standing orders as a preliminary corrective action.

**Continued Operations of the 9212 Complex.** In a letter to DOE dated March 13, 2007, the Board identified concerns regarding NNSA's ability to safely operate the 9212 Complex for an extended period of time and established an annual reporting requirement on the physical condition of the building's systems, structures, and components. On May 17, 2011, DOE briefed the Board on the Facility Risk Review Follow-on Study, which fulfilled the annual reporting requirement. The Board will continue to track the safety of operations in the 9212 Complex and advocate for necessary maintenance and repairs until the transition of these operations to the Uranium Processing Facility.

**LLNL Tritium Facility Safety Posture.** On March 29, 2011, the Board issued a letter expressing concern over the changes proposed in the contractor's annual update to the safety basis, particularly with the selection of credited controls to protect workers from fires and breaches in tritium confinement. NNSA responded to most of the Board's concerns and imposed several conditions of approval when it acted on the contractor's proposed safety basis; however, the Board remains concerned with the lack of a credited fire suppression system.

**LLNL Activity Level Work Planning.** LLNL implemented some improvements to address weaknesses identified by the Board in the processes used to plan and execute work. In 2010, the Board assessed that the laboratory guidance was vague and that the work planning process suffered as a result. NNSA continues to strengthen oversight in this area and has directed the contractor to undertake long-term improvements to these processes.

**Worker Training at LLNL.** The Board issued a letter on April 1, 2011, identifying areas where training of nuclear facility workers could be improved to enhance the safety of operations at LLNL. NNSA and the contractor are addressing these areas as they implement the revised DOE directive on training.

**NNS Device Assembly Facility (DAF) Fire Suppression System.** In 2008, the Board determined that the DAF fire suppression system had significant deficiencies that should be corrected before beginning more hazardous operations. In response, NNSA initiated a project to assess the condition of the system, analyze and prioritize needed improvements, developed improvement options, and began improvements to the system. In FY 2011, NNSA approved Critical Decision-0 (approval of mission need) for a project to replace the fire suppression system's lead-in piping. The contractor hired additional fire protection engineers to assist in performing walk-downs of the as-built condition of the fire suppression system and re-compute hydraulic calculations, is working toward replacing strainers

to filter debris from the system, and is procuring a standalone fire suppression unit for installation in DAF.

**NNSS Criticality Experiments Facility (CEF) Safety Basis and Instrumentation and Control.** In 2010 and 2011, the Board evaluated NNSS's readiness to begin operations at CEF. The Board identified concerns with the safety analysis, classification of controls, and the reliability of instrumentation and control systems. The Board communicated these issues to NNSA in staff-to-staff discussions. In response, NNSA identified corrective actions for each of the Board's concerns that contributed to the safe startup of CEF.

**Readiness to Dispose of a Damaged Nuclear Weapon or Improvised Device at NNSS.** NNSA developed a plan for implementation of safety controls and upgrades appropriate for the scope of operations for the facility at NNSS (G tunnel) that would be used in disposition of an improvised nuclear device. As a result of the Board's interactions and discussions in FY 2011, NNSA planned for operational safety improvements and conducted training and exercises.

**Formality of Operations for Subcritical Experiments at NNSS.** The Board reviewed several safety management programs at NNSS nuclear facilities. In a March 28, 2011, letter to NNSA, the Board identified a number of deficiencies related to work planning and control. As a result of interactions with the Board, NNSA implemented compensatory measures to improve the conduct of operations, work planning, and configuration of safety systems at nuclear facilities at NNSS.

**Exemption to Nuclear Safety Management rule at SNL.** The Board assessed the adequacy of the controls to process Hazard Category 3 quantities of waste at the Radioactive and Mixed Waste Management Facility at SNL. NNSA granted SNL an exemption to the Nuclear Safety Management rule (10 C.F.R. Part 830) for the processing of this waste. The Board found that the operation could be accomplished safely under the controls that had been implemented.

**SRS Tritium Facilities.** On August 19, 2011, the Board issued a letter that communicated deficiencies in both the safety basis and the effectiveness of the Emergency Preparedness program at the SRS Tritium Facilities. These deficiencies include the lack of adequate conservatism in input parameters for the consequence analysis, a change in safety philosophy that replaced several safety-related preventive controls with mitigative or administrative controls, and failure to demonstrate that the Emergency Preparedness program could perform its credited function. NNSA is developing its response to the issues identified by the Board and has already begun addressing some of the deficiencies with the Emergency Preparedness program. For example, Tritium Facilities personnel participated in field drills and underwent classroom training in order to bolster the effectiveness of the program.



## PERFORMANCE GOAL 2: SAFE PROCESSING AND STABILIZATION OF NUCLEAR MATERIAL

### Performance Goal 2

**Safe Processing and Stabilization of Nuclear Material.** The processing and disposition of DOE defense nuclear materials and facilities are performed in a manner that ensures adequate protection of the health and safety of the public, the workers, and the environment.

#### FY 2013 Performance Accomplishments

**Maintenance Program at the Waste Encapsulation and Storage Facility (WESF).** DOE provided a corrective action plan to address the Board's letter dated October 6, 2011, relating to the Waste Encapsulation and Storage Facility (WESF) maintenance program. Members of the Board's staff reviewed the closure packages associated with the plan and observed a contractor review of the effectiveness of the plan. As a result of the original letter and associated follow-up reviews, DOE made improvements in the areas of formal periodic monitoring and surveillance of design features, the quality/use of technical procedures, facility-specific system training, and the effectiveness of contractor oversight.

**Installation of Systems to Remove Spent Nuclear Fuel Sludge in the K-West Basin at the Hanford Site.** Members of the Board's staff reached an agreement with DOE on the path forward associated with design issues identified in a project letter dated July 31, 2012. DOE agreed to remove non-conservative assumptions implicit in the accident analysis and is specifying industry consensus standards for the design of safety-related instrumented control systems.

**Recommendation 2012-2, Hanford Tank Farms Flammable Gas Safety Strategy.** On September 28, 2012, the Board issued Recommendation 2012-2 to address the need to take action to reduce the risk posed by flammable gas events at the Hanford Tank Farms. The Secretary of Energy accepted the recommendation on January 7, 2013, and submitted an Implementation Plan on June 6, 2013, which the Board accepted. Members of the Board's staff began reviewing DOE's near-term actions to improve the flammable gas controls.

**Safety Basis of Hanford Tanks with Deep Sludge.** Members of the Board's staff questioned DOE regarding the potential for large spontaneous flammable gas release events in the tanks receiving sludge waste and accumulating deep sludge layers. DOE declared a potential inadequacy in the safety analysis and, in March 2013, approved a Justification for Continued Operation. The staff members reviewed this justification and identified deficiencies. The staff passed on observations to DOE that the deep sludge issue was inadequately characterized, and the compensatory measures described are not sufficiently defined.

**Integrity of High-Level Waste Tanks and Transfer System at Hanford.** DOE addressed a number of the performance and maintenance issues related to the waste transfer system identified in a Board letter dated April 26, 2011. The Board encouraged DOE to continue laboratory and in-situ testing of corrosion mechanisms for the high-level waste tanks. These efforts are important in determining whether DOE's tanks and transfer pipelines can continue to perform for an anticipated 30 or more years. Members of the Board's staff continue to monitor progress in this area. The staff also reviewed DOE's analyses of potential leaks of high-level wastes from a single-shell tank and a double-shell tank at Hanford.

**Activity Level Work Planning and Control at the Plutonium Finishing Plant (PFP).** Members of the Board's staff conducted an on-site review of activity-level work planning and control at the Plutonium Finishing Plant and noted that the quality of work packages was enhanced by the consistent reinforcement of high expectations from PFP senior management and persistent, focused work planning and control oversight from DOE. The staff members continued to monitor work planning and execution at PFP.

**Long Term Storage of Spent Nuclear Fuel at SRS.** The Board issued Technical Report 38, regarding the storage conditions of reactive metal fuels in L-Basin at SRS. In this report, members of the Board's staff identified that the reactive metal fuels are vulnerable to degradation, and that degradation is already occurring. As the fuel degrades, it becomes more difficult to handle, repackage, and/or process in the future. The Board encouraged DOE to give more attention to the disposition of these materials.

**Plutonium Processing at H-Canyon and HB-Line.** Members of the Board's staff reviewed the safety basis developed by the contractor to support the resumption of plutonium processing in HB-Line. The staff identified

weaknesses in the safety strategy, which may have put the facility workers at risk in case of a fire, or led to vessel explosions in the case of a loss of power. DOE responded to these concerns by deciding to maintain a fire detection, alarm and notification system, and diesel generator as safety significant equipment.

**Operations at SRS High Level Waste Facilities.** Members of the Board's staff monitored operations in the Tank Farms and the Defense Waste Processing Facility (DWPF). In December 2012, a fire affected a transformer in DWPF. The staff reviewed the actions being taken by DOE to prevent a recurrence. These actions are reasonable, but the staff continues to monitor the situation. In January 2013, a fire in a Tank Farms trailer occurred near nuclear facilities and near a storage area for hazardous chemicals. The staff encouraged DOE to analyze the potential for fires in such structures to impact nuclear facilities or the workers operating those facilities.

**Recommendation 2012-1, Savannah River Site Building 235-F Safety.** In FY 2012, the Board issued Recommendation 2012-1, identifying the need for DOE to remove or immobilize the residual plutonium-238 contamination located within Building 235-F because of the material's physical form, its significant quantity, and the more than 1000 site workers located nearby. As a result, during FY 2013 DOE took action to improve the safety posture of this facility by reducing transient combustibles and conducting emergency response drills. In addition, DOE developed a deactivation plan and began development of a safety basis to support initiation of deactivation activities and the removal of the residual contamination.

**Neptunium Oxide Storage at INL.** Members of the Board's staff reviewed the storage of neptunium oxide at the Fuel Manufacturing Facility vault. DOE's Office of Nuclear Energy plans to conduct surveillance of six storage containers during 2014. A specially designed glovebox is being procured by INL to facilitate the surveillance and repackaging. The staff reviewed the design of the glovebox and raised questions to DOE regarding the adequacy of the planning for handling the containers for insertion into the glovebox. DOE is working to respond to the staff's concerns.

**Integrated Waste Treatment Unit at INL.** DOE developed a corrective action plan in response to the June 2012 over-pressurization event at IWTU. Members of the Board's staff reviewed DOE's development and initial implementation of this plan. The staff members noted several vulnerabilities in the corrective action plan, which they communicated to DOE. DOE acted to address the staff's concerns. The staff continues to monitor the project's progress.

**Transuranic Waste Operations at INL.** Members of the Board's staff continued to review TRU waste operations at the Advanced Mixed Waste Treatment Project (AMWTP). In July 2013, the staff observed the much-delayed verification of Phase II implementation of Integrated Safety Management (ISM) Systems by the new contractor at AMWTP. The staff raised questions as to the absence of procedural compliance during a maintenance operation requiring step-by-step compliance. DOE incorporated the staff's observations in the closeout report.

**Uranium-233 Disposition at ORNL Building 3019.** Members of the Board's staff raised several safety and design-related concerns to DOE associated with the U-233 Disposition Project's "Phase II," in which U-233 materials will be processed for disposal. DOE intends to work toward addressing the staff members' concerns as it develops its Phase II plans.

**WIPP Maintenance Program.** On June 27, 2012, the Board issued a letter identifying safety issues associated with the formality and rigor of work planning and control for the maintenance program at WIPP. DOE and the contractor began to address the identified deficiencies. Members of the Board's staff followed these efforts to fully address the deficiencies.

**Performance Goal 2**

**Safe Processing and Stabilization of Nuclear Material.** The processing and disposition of DOE defense nuclear materials and facilities are performed in a manner that ensures adequate protection of the health and safety of the public, the workers, and the environment.

**FY 2012 Performance Accomplishments**

**Hanford Waste Encapsulation and Storage Facility (WESF).** In October 2011, the Board sent DOE a letter documenting issues identified during a review of the facility’s maintenance program and conduct of operations. The contractor completed numerous corrective actions and, with oversight from DOE, initiated a management assessment of nuclear operations at WESF and the Canister Storage Building in the fall of 2011. Subsequently, the contractor accomplished similar evaluations at some of its other defense nuclear facilities through the institution of a Nuclear Safety and Performance Evaluation Board. The contractor also rearranged the waste capsules in WESF to better distribute the heat load in the storage pools; thereby extending the time capsules would maintain their integrity after a seismically-induced loss of basin water accident.

**Hanford Canister Storage Building.** The Board evaluated the contractor readiness assessment for the restart of receiving multi-canister overpack containers from K Basin cleanout work. The Board identified a number of minor issues with procedures and conduct of operations that were addressed by the contractor. The Board also identified, that contrary to the requirements in DOE Order 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities*, DOE did not perform a readiness assessment of its own. The Board discussed adherence to DOE’s directives with DOE Richland Operations Office personnel and contractors.

**Hanford Processing of K-Basin Wastes.** The Board evaluated preparations at the K-West Basin and Cold Vacuum Drying Facility to process knock out pot material from the K-West Basin for safe interim storage at the Canister Storage Building. It was evident that the extensive testing and operator training for the operations was very helpful. The contractor initially planned to restart the Cold Vacuum Drying Facility for these operations without a formal readiness assessment to ensure the equipment and personnel were ready to resume operations safely. Subsequent to discussions with the Board’s staff, the contractor completed a formal readiness assessment prior to authorizing facility operation. As a result of the thorough preparations, the knock out pot material was successfully removed from the K-West Basin, processed at the Cold Vacuum Drying Facility, and is now safely stored away from the Columbia River in the Canister Storage Building.

**Hanford K-West Basin Sludge Retrieval and Disposition Project.** The Board reviewed DOE’s conceptual and preliminary designs for systems to remove radioactive sludge from the K-West Basin at Hanford and noted several design issues. As a result, DOE has included control of public access to the Columbia River as part of the safety control set, resolved design issues regarding the structural details of K-West Basin Modified Annex, agreed to remove non-conservative assumptions implicit in the accident analysis, and is specifying industry consensus standards for the design of safety-related instrumented control systems.

**Safety Basis at Hanford Tank Farms.** In response to a Board letter dated August 5, 2010, DOE committed to amend the safety basis to restore the safety-significant classification of the primary ventilation systems of the double-shell tanks to better prevent flammable gas events. Continued review and emphasis by the Board has been needed because DOE continues to defer execution of these commitments. On September 28, 2012, the Board issued Recommendation 2012-2, *Hanford Tank Farms Flammable Gas Safety Strategy*, to address the need to take action to reduce the risk posed by flammable gas events at the Hanford Tank Farms.

**Integrity of High-Level Waste Tanks and Transfer System at Hanford.** DOE addressed some of the performance and maintenance issues of the waste transfer system identified in a Board letter dated April 26, 2011, in a Fitness for Service Program that DOE is evaluating to implement at the Hanford Tank Farms. The Board is closely following the development of the Fitness for Service test plan, and encouraged DOE to continue laboratory and in-situ testing of corrosion mechanisms for the high-level waste tanks. These efforts are important in determining whether DOE’s tanks and transfer pipelines can continue to perform for an anticipated 30 or more years. The Board is closely following DOE’s recent efforts to determine if a double-shell tank has started to leak, as well as associated contingency plans and evaluations of other tanks containing similar wastes.

The Board’s letter identified deficiencies in the methodology used by the Tank Farms contractor for extending the service life of hose-in-hose transfer lines. DOE began to develop a test plan for studying the aging of such lines and other common polymer components under environmental conditions at the Tank Farms. The Board continues to review progress in this area.

**Conduct of Operations at Hanford Tank Farms.** The Board reviewed DOE's corrective actions in response to conduct of operations issues at the Tank Farms identified in a letter to DOE dated March 30, 2011, and assessed whether various elements of the conduct of operations program were adequately implemented. The Board found that DOE had made progress in correcting deficiencies in some areas, but that further actions are needed in other areas. The Board is working with DOE to address the remaining deficiencies.

**618-10/-11 Burial Ground Vertical Pipe Unit (VPU) Remediation Project at Hanford.** The Board reviewed the design and process activities for retrieval of the radioactive wastes in the VPUs. This review identified safety issues and questions that are being addressed by the DOE and its contractor. Of particular importance were the need for greater rigor in providing a capability to confine potential releases of hazardous materials and implementation of As Low As Reasonably Achievable (ALARA) radiological safety principles. Subsequently, the contractor expanded active confinement capability and has committed to perform an ALARA review earlier in design than originally planned.

**Recommendation 2012-1, Savannah River Site Building 235-F Safety.** The Board issued Recommendation 2012-1 on May 9, 2012, identifying the need for DOE to take action to reduce the hazards associated with the large amounts of residual plutonium-238 contamination within defunct process equipment in Building 235-F. On July 10, 2012, the Secretary of Energy accepted the recommendation. DOE's Implementation Plan for the recommendation is due to the Board in October 2012.

**Recommendation 2001-1, High Level Waste Management at the Savannah River Site.** The Board closed Recommendation 2001-1 on December 7, 2011, because DOE has made satisfactory progress in meeting the intent of the recommendation. Ongoing high-level waste operations will be evaluated through the Board's normal oversight processes.

**Emergency Preparedness at SRS.** The Board continued its review of DOE's emergency preparedness programs at SRS. In large part due to the Board's encouragement at its June 2011 public meeting at SRS, DOE conducted two large-scale, multi-facility, multi-contractor exercises to evaluate the site's ability to respond to a major accident. DOE is using the lessons learned from these exercises to improve emergency preparedness at SRS.

**Savannah River Fire Protection Water Supplies.** The Board reviewed the fire protection water supplies for A- and K-areas at SRS. The Board found that the systems were not maintained in compliance with applicable standards and documented these observations in a letter to DOE on March 27, 2012. DOE has made progress correcting the deficiencies in K-area and is developing modifications for the fire protection systems in A-area.

**Transuranic Waste Operations at SRS.** The Board reviewed the safety of transuranic waste remediation operations in E-area, F-Canyon and H-Canyon. The Board encouraged DOE to make improvements in worker protection, fire suppression systems, and tool use.

**Long Term Storage of Spent Nuclear Fuel at SRS.** The Board assessed the safety of long term storage of spent nuclear fuel in L-area at SRS. DOE no longer has an ultimate disposition path for much of this nuclear material, and its storage time may increase dramatically. The Board identified concerns with several categories of materials stored in the basin, particularly reactive fuels stored in isolation cans. The Board is working with DOE to ensure that items undergoing degradation are properly addressed.

**Processing of Spent Fuel in SRS H-Canyon.** In February 2011, the Board sent a letter to DOE regarding the shutdown of H-Canyon and the fate of spent nuclear fuel and other surplus nuclear materials. In FY 2012, DOE decided to process vulnerable sodium reactor experiment fuel in H-Canyon to eliminate that material from storage in L area. The Board reviewed the process and startup preparations for this activity and found them to be satisfactory.

**Planned Plutonium Processing in SRS H-Canyon and HB-Line.** DOE is planning a new plutonium processing mission in H-Canyon and HB-Line in support of the Mixed Oxide Fuel Fabrication Facility under construction at SRS. The Board is reviewing the safety basis documentation and facility modifications supporting this new mission.

**Neptunium Oxide Storage at INL.** The Board reviewed the storage of neptunium oxide at the Fuel Manufacturing Facility vault. No radiological contamination has been found outside the containers. However,

O-ring seals in the containers have been in place since 2004 and are approaching the end of their design lifetime. The Board will continue to monitor DOE's management of this material.

**Integrated Waste Treatment Unit at INL.** The Board reviewed the contractor and DOE readiness assessment activities and found that they adequately conformed to the relevant DOE directives. During startup of the facility prior to processing radioactive waste, the facility suffered a process upset that will require significant corrective actions, including design changes. The Board continues to follow this project closely.

**Transuranic Waste Operations at INL.** The Board continued to review transuranic waste operations conducted at the Advanced Mixed Waste Treatment Project (AMWTP). In June 2012, the staff reviewed site's health physics program and found that it adequately conformed to DOE directives. The Board's staff continues to monitor activities at AMWTP as it begins to process waste forms more complex than previously encountered.

**Uranium-233 Disposition at ORNL Building 3019.** A Board review of the technical basis for the radiation protection program revealed weaknesses that were addressed by DOE and the contractor. The contractor subsequently improved the peer review process used to review technical documents associated with the program. DOE successfully transferred two categories of uranium-233 materials out of Building 3019, is preparing to conduct a third transfer campaign, and is developing plans to process the uranium-233 materials stored in Building 3019 that cannot be disposed of directly. The Board will continue to monitor the safety of the transfer of materials and will review safety-related aspects of DOE's uranium-233 processing plans as they are developed.

**Oak Ridge Transuranic Waste Processing Center Cask Processing Enclosure.** The Board observed startup activities for the Cask Processing Enclosure. DOE was reluctant to conduct an independent readiness assessment; however, through discussions with the Board, DOE determined that an independent DOE readiness assessment was required by DOE directives. The contractor and DOE readiness assessments were successfully completed in June 2012, and the Cask Processing Enclosure is now operational.

**Fire Protection at WIPP.** The Board reviewed the fire protection program at WIPP and noted a number of deficiencies in a letter dated June 24, 2011. DOE acknowledged these problems and agreed to take corrective action. The Board's staff continues to follow implementation of the corrective actions.

**WIPP Maintenance Program.** On June 27, 2012, the Board issued a letter identifying safety issues associated with the formality and rigor of work planning and control for the maintenance program at WIPP. DOE and the contractor have taken steps to address the identified deficiencies.

**Recommendation 2005-1, Nuclear Material Packaging.** The Board issued Recommendation 2005-1 to increase protection for workers involved in the storage and handling of nuclear materials. In 2012, the Board continued to work with DOE to ensure that the SAVY-4000 containers developed at LANL are approved by the Los Alamos Site Office as meeting the requirements of DOE Manual 441.1-1, *Nuclear Material Packaging Manual*. The Board also worked with DOE to ensure that procedures are established to certify these containers for storage of plutonium-based materials at DOE sites other than LANL.

**Performance Goal 2**

**Safe Processing and Stabilization of Nuclear Material.** The processing and disposition of DOE defense nuclear materials and facilities are performed in a manner that ensures adequate protection of the health and safety of the public, the workers, and the environment.

**FY 2011 Performance Accomplishments**

**Nuclear Materials Stabilization.** DOE dramatically changed its plans for stabilization of surplus nuclear materials. DOE did not authorize the operation of the H-Canyon facility at SRS to process spent nuclear fuel, leaving the fate of the fuel and other materials in question. The Board sent a letter to DOE on February 28, 2011, outlining associated safety concerns. DOE responded by providing new disposition paths for a significant portion of the nuclear materials but has not developed a new strategy for spent nuclear fuel.

**Public Hearing at the Savannah River Site.** The Board held a public hearing at SRS on June 16, 2011, to discuss safety matters related to liquid waste processing, emergency preparedness, and nuclear materials disposition. The Board obtained commitments from DOE to develop a resumption plan for H-Canyon and to start performing emergency drills for seismic events that could impact multiple nuclear facilities. The hearing also drew increased DOE attention to integrated operations of liquid waste management facilities.

**Electrical Safety at H-Canyon.** In response to a Board letter dated February 6, 2009, DOE completed design and installation of a lightning protection system for the H-Canyon fan house at SRS.

**Hanford Sludge Retrieval and Disposition Project.** The Board reviewed DOE's conceptual design for systems to remove radioactive sludge from the K-West Basin at Hanford and noted several design issues. In response to a Board letter on the topic dated December 22, 2010, DOE is enhancing safety systems, improving its accident analysis, and developing a new capability to evacuate members of the public from the Columbia River in the event of a nuclear accident.

**Restart of the Cold Vacuum Drying Facility.** The Board reviewed the plans to restart operations at the Cold Vacuum Drying Facility. This facility will support K-West Basin clean up as well as sludge disposition. The Board suggested that DOE reconsider the planned level of rigor for restarting this inactive facility. DOE now plans to use a formal readiness assessment.

**Long Term Storage of Spent Nuclear Fuel at SRS.** The Board began assessing the safety of spent nuclear fuel in storage in L Basin at SRS. DOE no longer has an ultimate disposition path for much of this fuel, and its storage time may increase dramatically. After inquiries by the Board, DOE expanded surveillances of the spent nuclear fuel to examine the extent of fuel damage and needed remedial action.

**Recommendation 2001-1.** In a letter to DOE dated January 28, 2011, the Board accepted a new implementation plan for Recommendation 2001-1, *High Level Waste Management at the Savannah River Site*, to replace an interim plan from last year. In the new plan, DOE provided concrete interim goals to show progress in meeting the recommendation. To date, DOE has been successful in completing these new milestones.

**Structural Integrity of Hanford Tank C-105.** In response to a stakeholder's letter, the Board evaluated potential damage to the footing of single-shell Tank C-105 caused by a borehole-drilling rig. As noted in a letter dated June 9, 2011, to the stakeholder, the Board reviewed a DOE analysis that estimated the potential damage to Tank C-105. Although the energy imparted by the borehole-drilling rig would not be sufficient to damage the tank, the Board informed DOE that if radionuclide concentrations in the soil start to increase significantly, DOE should expeditiously remove the remaining waste from the tank.

**Safety Basis at Hanford Tank Farms.** In response to a Board letter dated August 5, 2010, DOE committed to amend the safety basis to restore the functional classification of the primary ventilation systems of the double-shell tanks to safety significant and identified physical improvements needed in the systems.

**HLW Transfer System at Hanford.** The Board reviewed the systems used to confine waste at the Tank Farms during waste transfer operations. In a letter dated April 26, 2011, the Board identified issues regarding the qualification, performance, and maintenance of the waste transfer system, as well as deficiencies in the safety basis. DOE is working with the Board to address these deficiencies.

**Conduct of Operations at Hanford Tank Farms.** The Board reviewed conduct of operations at the Hanford Tank Farms. In a letter to DOE dated March 30, 2011, the Board noted weaknesses in the formality demonstrated by operators and supervisors while conducting nuclear operations. In response, DOE took action

to address the issues.

**Hanford Waste Encapsulation and Storage Facility (WESF).** The Board reviewed the planning and conduct of maintenance at WESF and identified numerous deficiencies. Following the review, contractor managers began addressing the issues.

**Work Planning and Control at Hanford Plateau Remediation.** The Board reviewed work planning and control processes for work done by the plateau remediation contractor. In a letter dated September 23, 2010, the Board identified weaknesses in the contractor's activity-level hazard analysis process. During fiscal year 2011, the contractor piloted improvements to its work planning process.

**Work Planning and Control at Hanford's River Corridor Project.** On February 25, 2011, the Board sent a letter to DOE following the Board's review of the activity-level work planning and control process implemented by Washington Closure Hanford, LLC, noting improvements since a review in October 2008.

**Transuranic Waste Operations at INL.** The Board reviewed transuranic waste operations at INL. The Board discussed procedural compliance issues with DOE and its contractor, who took corrective actions. The Board tracked DOE's development of engineered controls to ensure the safe retrieval of degraded TRU waste boxes and drums at the Advanced Mixed Waste Treatment Project at INL. DOE and the Board identified problems with the contractor's implementation of controls during the DOE readiness assessment in September 2011.

**Transuranic Waste Operations at SRS.** The Board reviewed the startup of new phases of transuranic waste remediation operations in E-area, F-Canyon, and H-Canyon. The Board found that during the F-Canyon readiness assessments, operators and shift operations managers did not have a strong level of knowledge of topics such as safety basis requirements. DOE conducted remedial training for affected personnel.

**Fire Protection at WIPP.** The Board reviewed the fire protection program at WIPP and, in a letter dated June 24, 2011, noted a number of deficiencies. DOE acknowledged these problems and agreed to take corrective action. A DOE progress briefing to the Board is required by December 21, 2011.

**Work Planning and Control at WIPP.** The Board reviewed work planning and control programs for waste handling at WIPP. In a letter dated October 22, 2010, the Board identified problems in conduct of operations and site-wide safety culture. DOE acknowledged these issues and agreed to address them in a letter dated January 20, 2011. The Board has continued to track DOE progress in addressing these issues.

**Electrical Safety at WIPP.** The Board visited WIPP in March 2011 and discussed DOE progress on corrective actions for electrical safety issues noted previously by the Board. DOE continued to address these issues as noted in the DOE letter dated December 21, 2010, and completed all commitments by the end of FY 2011.

**Radiation Protection Program at WIPP.** In 2010, the Board noted weaknesses in the requalification process for radiological control technicians. DOE subsequently revised the process to correct the weaknesses. The Board confirmed that the revised process was implemented and effective during a visit to WIPP in March 2011.

**Tank W-1A Removal Action Project at ORNL.** The Board reviewed the safety basis and radiological controls for the Tank W-1A Removal Action Project at ORNL in December 2010. In response to issues identified by the Board's staff, DOE revised project documents to strengthen their technical bases and improved working-level documents prior to the DOE readiness review in August 2011. Project work began in September 2011.

**Plutonium Finishing Plant (PFP) Criticality Safety Controls.** During a review of PFP work planning documents, the Board noted that not all of the Criticality Prevention Specification (CPS) requirements were listed in the work instruction, which is contrary to nuclear consensus standards. This concern was communicated to DOE criticality safety personnel who, in turn, discussed the situation with the contractor. Subsequently, the contractor agreed to include the CPS requirements as an appendix to the work instruction

## PERFORMANCE GOAL 3: SAFETY IN NUCLEAR FACILITIES DESIGN AND INFRASTRUCTURE

<b>Performance Goal 3</b>	<p><b><u>Safety in Nuclear Facilities Design and Infrastructure.</u></b> DOE's new defense nuclear facilities and major modifications to existing facilities are designed and constructed in a manner that ensures adequate protection of the health and safety of the public, the workers, and the environment.</p>
<b>FY 2013 Performance Accomplishments</b>	
<p><b>Waste Treatment and Immobilization Plant (WTP) at the Hanford Site.</b> The Board continued its review of the design and construction of structures, systems, and components designated as important-to-safety in the WTP facilities. During this fiscal year, the Board did not identify any new safety issues with WTP. The Board's activities primarily consisted of evaluating potential safety issues and the adequacy of DOE's actions to resolve outstanding safety issues. Specific examples are cited below.</p> <ul style="list-style-type: none"> <li>• On November 8, 2012, the Secretary of Energy informed the Board that DOE needed to revise its strategy for verifying key parts of the WTP design. This required DOE to revise the Implementation Plan for Recommendation 2010-2, <i>Pulse Jet Mixing at the Waste Treatment and Immobilization Plant</i>. In a letter dated July 15, 2013, the Board expressed concern with DOE's delay in revising the design verification philosophy and development of the revised Implementation Plan. Members of the Board's staff have engaged with DOE on drafting a revision of the Implementation Plan.</li> <li>• Because of DOE's new design verification strategy, the Board closed an outstanding safety issue with DOE's effort to verify and validate the FLUENT computational fluid dynamics model as it would no longer be used for mixing system design confirmation. The Board identified this issue in a letter to DOE dated April 3, 2012.</li> <li>• Members of the Board's staff reviewed testing at Pacific Northwest National Laboratory that comprises DOE's efforts to resolve an issue with the methodology for assessing dose consequences from pressurized spray leaks involving radioactive liquids at WTP. The testing concluded that DOE's spray leak model is non-conservative. The Board first identified this safety issue in a letter dated April 5, 2011.</li> <li>• The Board reviewed DOE's response to the Board's April 13, 2012, letter identifying safety issues with the design and construction of the electrical distribution system for WTP. The Board concluded that the response identified a reasonable plan for resolving these issues during the next several years.</li> <li>• Members of the Board's staff reviewed the project's efforts to update the safety basis for the Low-Activity Waste (LAW) and HLW facilities and upgrade the hazard characterization for the LAW facility. The staff identified and communicated to DOE several deficiencies with the hazard analyses. DOE subsequently paused project hazard analysis efforts to correct the deficiencies.</li> <li>• Members of the Board's staff reviewed the project's efforts to re-qualify black cell components as safety significant. As a result of interactions between DOE and the staff, the project revised a supporting calculation to demonstrate adequate structural performance of the black cell components.</li> </ul> <p><b>Waste Feed Mixing and Delivery Systems at Hanford.</b> Members of the Board's staff continued to observe DOE's efforts on a small-scale mixing demonstration for the Hanford double-shell tank waste feed delivery system. The staff's activities included reviewing DOE's plans for and subsequent results from mixing and sampling tests associated with the Hanford double-shell tank waste feed delivery system, and DOE's plans and analyses for the Hanford tank farm waste feed certification process. Based on these reviews, DOE decided to pursue a different capability for characterizing and sampling Hanford tank farm waste.</p> <p><b>Salt Waste Processing Facility (SWPF) as SRS.</b> The Board reviewed and closed the two remaining safety issues with the SWPF project related to shortcomings with process vessel air pulse agitator (APA) mixing system testing and modeling, and deficiencies in how the project analyzes accidents resulting from detonation and deflagration of flammable gas in process vessels and piping systems. The Board identified these safety issues in letters to DOE dated February 10, 2009, and October 15, 2009, respectively. As a result of these reviews, DOE demonstrated its APA mixing system safety functions using a credible testing program and created new flammable gas safety and</p>	



administrative controls that meet applicable DOE requirements. Members of the Board's staff also reviewed the design and implementation of the Instrumentation and Control (I&C) System for the SWPF project. The review did not identify any significant safety issues but did identify several concerns that the project team subsequently addressed to demonstrate that the I&C system will be designed to perform its safety function.

**Uranium Processing Facility (UPF) at the Y-12 National Security Complex.** During this fiscal year, the Board reviewed NNSA's actions to resolve issues identified in its April 2, 2012, letter to NNSA concerning the integration of safety into the UPF design. Notably, the Board and its staff reviewed major revisions of the project's Preliminary Safety Design Report and supporting design documentation. The Board's review determined that while NNSA has made progress in addressing prior issues, additional action is needed by NNSA to ensure that the project complies with DOE's nuclear safety requirements and to continue improving the integration of safety into the UPF design. The Board documented its concerns in a letter to NNSA dated August 26, 2013. The Board has worked with NNSA to establish approaches for resolving these new concerns. Members of the Board's staff also reviewed and found reasonable NNSA's plan for validating structural modeling assumptions and design techniques. NNSA developed the plan in response to the Board's September 6, 2012, letter that identified issues with the impact of modeling assumptions not yet validated by the project on localized building behavior during seismic loading.

On October 2, 2012, the Board conducted a public hearing at Y-12 to discuss UPF safety issues with NNSA. The hearing also addressed NNSA's plans to mitigate safety concerns that could arise from planned changes to the project's execution strategy and major redesign activities. Due to changes in the project's execution strategy, the UPF project did not issue a formal revision of the Project Execution Plan during this fiscal year. The Board will review the revised plan when available.

**Transuranic Waste Processing Center (TWPC) Sludge Processing Facility Buildouts (SL-PFB) Project at Oak Ridge National Laboratory (ORNL).** Members of the Board's staff reviewed the conceptual design and safety design strategy for the SL-PFB project. The review identified no safety issues that would preclude the project from advancing to the next design stage (preliminary design). However, the review identified concerns with accident modeling parameters, seismic design requirements for safety systems, and the project team's evaluation of accidents involving potential detonations in process piping. During the staff's review, the project team committed to addressing these concerns. The staff's review will support the Board's development of a project letter for Critical Decision-1 in the next fiscal year.

**Transuranic Waste Facility Project at LANL.** On October 9, 2012, NNSA responded to the Board's June 11, 2012, letter that identified issues associated with the design and safety basis of the new Transuranic Waste Facility (TWF) at LANL. These issues included: (1) the use of non-conservative values for accident analysis parameters; (2) inadequate bases for screening external man-made accidents such as large truck and aircraft crashes in the accident analysis; and (3) an inadequate definition of the boundary for a system supporting the operability of the safety-related fire suppression system. Members of the Board's staff reviewed NNSA's response and supporting material and discussed subsequent concerns with NNSA officials. In addition, the Board received and members of the Board's staff began reviewing the Preliminary Documented Safety Analysis (PDSA).

**Electrical Safety at DOE Facilities.** During this fiscal year, members of the Board's staff reviewed the adequacy of the electrical safety programs (ESPs) and electrical distribution systems (EDSs) at LANL's Plutonium Facility and at the Pantex Plant. These reviews indicated that the ESPs are well organized, supported, and integrated with site operations. The reviews also identified several safety concerns with the seismic qualification of certain EDS components and emergency lighting at LANL and with the design of the battery room ventilation system for diluting explosive hydrogen gas at Pantex. DOE has committed to addressing the staff's concerns, and the staff is monitoring DOE's actions.

During this fiscal year, DOE also issued a revision of the DOE Electrical Safety Handbook (DOE-HDBK-1092-2013). The revision adequately addresses concerns previously raised by members of the Board's staff with the handbook.

**Probabilistic Seismic Hazard Analysis (PSHA) for SRS and Hanford.** Members of the Board's staff observed activities associated with updating the PSHAs at SRS and Hanford. The staff reviewed the SRS seismic hazard calculations and draft report dated May 2013, and has engaged DOE to address concerns in the final report. The staff participated in the second workshop to update the Hanford PSHA and followed DOE's progress toward developing the final report which is anticipated in late FY 2014.

**Deficiencies with the System for the Analysis of Soil-Structure Interaction (SASSI) Computer Software.** The DOE complex uses the computer program SASSI to evaluate interaction effects between nuclear facility structures and supporting soils. In an April 8, 2011, letter to DOE, the Board highlighted its concern that issues with the program could lead to erroneous conclusions that affect the safety-related structural design at DOE defense nuclear facilities. DOE responded to the Board in letters dated July 29, 2011, October 5, 2011, and December 27, 2011. DOE agreed with the Board's concerns and is taking actions to address both technical and quality assurance issues. DOE developed a SASSI Project Plan and Technical Work Plan that will result in an improved set of SASSI validation and verification problems. During this fiscal year, members of the Board's staff continued to monitor DOE's execution of these plans.

**Periodic Reports to Congress.** The Board issued two periodic reports to Congress on the status of significant unresolved technical differences between the Board and DOE on issues concerning the design and construction of DOE's defense nuclear facilities. These reports have been highly effective in communicating Board concerns to Congress, as well as to DOE senior management. The reports were issued December 24, 2012, and July 15, 2013, respectively.

### Performance Goal 3

**Safety in Nuclear Facilities Design and Infrastructure.** DOE's new defense nuclear facilities and major modifications to existing facilities are designed and constructed in a manner that ensures adequate protection of the health and safety of the public, the workers, and the environment.

#### FY 2012 Performance Accomplishments

**Waste Treatment and Immobilization Plant (WTP) at the Hanford Site.** The Board has continued its review of the design and construction of important-to-safety structures, systems, and components in the WTP facilities. The Board's activities primarily consisted of the identification and evaluation of emerging safety issues and the resolution of previously identified safety issues. Specifically:

- The Board held three separate public meeting and hearing sessions concerning WTP on March 22, 2012, and May 22, 2012. The sessions addressed unresolved technical issues with pulse jet mixing in WTP vessels, erosion and corrosion of process component materials, misalignments between the design and safety bases, and resolution of concerns with safety culture.
- On January 12, 2012, the Board evaluated and accepted DOE's Implementation Plan for the Board's Recommendation 2010-2, *Pulse Jet Mixing at the Waste Treatment and Immobilization Plant*. The recommendation addresses unresolved technical concerns with the WTP mixing and transfer systems.
- In a letter to DOE dated January 20, 2012, the Board identified safety issues with DOE's approach to resolving issues related to wear allowances for erosion/corrosion of piping and vessels at WTP.
- The Board evaluated and accepted DOE's Implementation Plan for Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant*, with a request to take into account emerging information gained from DOE's assessment of safety culture at the WTP project.
- In a letter to DOE dated April 3, 2012, the Board identified safety issues with DOE's effort to verify and validate the FLUENT computational fluid dynamics model that will be used for mixing system design confirmation.
- In a letter to DOE dated April 13, 2012, the Board identified safety issues with the design and construction of the electrical distribution system for WTP.
- In a letter to DOE dated August 8, 2012, the Board expressed concern that the portions of the WTP piping design that transport slurries will not prevent the formation of sliding beds of solids along the bottom of process piping, posing a concern for erosion of the piping.

**Waste Feed Mixing and Delivery Systems at Hanford.** The Board observed DOE's efforts on a small-scale mixing demonstration for the Hanford double-shell tank waste feed delivery system. During development of the implementation plan for Recommendation 2010-2, the Board communicated to DOE the need to establish technical and safety requirements for the waste feed delivery system.

**Integrated Waste Treatment Unit at Idaho National Laboratory.** The Board reviewed the installation and testing of the safety-significant instrumentation systems that protect workers at Idaho National Laboratory from potential chemical and radiological hazards associated with operation of the Integrated Waste Treatment Unit. Additionally, the Board reviewed the project team's processes for system testing and evaluated the adequacy of the project team's efforts to resolve problems during component and system testing. The Board also reviewed the project's processes for training and preparing operators to safely operate the new facility. The Board observed both the contractor and DOE Operational Readiness Reviews and evaluated final integrated system testing to support the eventual introduction of radioactive waste into the facility for processing. Based on issues identified during the testing, waste processing is not expected to begin until April 2013.

**Chemistry and Metallurgy Research Replacement Project at Los Alamos National Laboratory (LANL).** DOE developed a set of activities necessary to substantially complete the Chemistry and Metallurgy Research Replacement Nuclear Facility design by the end of calendar year 2012. The Board monitored these design completion activities.

**Radioactive Liquid Waste Treatment Facility (RLWTF) Upgrade Project at LANL.** The Board resumed oversight of the RLWTF Upgrade Project after DOE finished an evaluation of alternatives to reduce project cost. Initial Board activities included a review of the project's draft Safety Design Strategy.

**Transuranic Waste Facility Project at LANL.** The Board completed its review of the preliminary design and safety basis for the Transuranic Waste Facility project. The Board's review identified several issues that could impact the identification, design, and functional classification of safety-related controls for protecting the public and workers. The Board formally communicated these issues to DOE in a letter dated June 11, 2012. These issues included: (1) the use

of non-conservative values for accident analysis parameters; (2) inadequate bases for screening external man-made accidents such as large truck and aircraft crashes in the accident analysis; and (3) an inadequate definition of the boundary for a system supporting the operability of the safety-related fire suppression system.

**Salt Waste Processing Facility (SWPF) at SRS.** As part of construction oversight, the Board reviewed the welding program at SWPF and concluded that the program met the appropriate requirements. The Board noted a high cumulative rejection rate (12 percent) of production piping welds during radiographic inspection. The Board observed that many of the piping welds were manual welds on small piping which are difficult to produce. The Board was especially concerned with welds joining piping and vessel nozzles on process vessels. The SWPF project is shifting from manual to orbital machine welding to reduce the rejection rate of piping welds.

The Board and DOE closed out a longstanding issue concerning operator actions following a seismic event. DOE implemented a number of design changes to ensure that operator actions required to prevent explosions following an earthquake could be accomplished, such as including seismically qualified interlocks to shut down large recirculation pumps to process vessels should waste temperatures exceed a specified limit. DOE also performed detailed calculations of the temperature rise of the liquid waste in process vessels if cooling is lost due to an earthquake. DOE will use these calculations to develop safety controls to prevent explosions. The Board reviewed these calculations and found them to be acceptable. The Board and DOE also closed one additional safety issue related to mixing system controls and made significant progress towards closing issues related to flammable gas control.

**Uranium Processing Facility (UPF) at the Y-12 National Security Complex.** DOE completed development of the safety documentation supporting the preliminary design of UPF in August 2011. The Board conducted a review of the project's safety design strategy and preliminary safety design report and concluded that they did not adequately implement DOE's requirements to integrate safety into the preliminary design. The Board documented these issues in a letter to DOE dated April 2, 2012. The Board subsequently worked with DOE to establish approaches to resolving the concerns identified in the letter.

In a letter to DOE dated September 6, 2012, the Board noted that the overall structural design of the main UPF building is adequate, but that the UPF project needed to validate a number of modeling assumptions in the structural analyses that could conceal issues with the performance of local areas of the structure.

The Board and NNSA closed issues related to the Board's letter to NNSA dated March 15, 2010, which identified concerns related to the geotechnical and structural analysis of UPF.

**Electrical Safety.** DOE is revising the DOE Electrical Safety Handbook (DOE-HDBK-1092-2004). The Board reviewed and provided DOE with comments on the draft revision. DOE expects to issue the revised standard in FY 2012.

**Central and Eastern United States (CEUS) Seismic Source Characterization (SSC) Project.** The CEUS SSC project was completed and published as NUREG-2115, *Central and Eastern United States Seismic Source Characterization for Nuclear Facilities* (January 2012). The CEUS SSC project was a cooperative effort sponsored by DOE, the Electric Power Research Institute (as the nuclear industry representative), and the United States Nuclear Regulatory Commission. The Board's staff participated as a member of the participatory peer review panel. The product of this effort was a regional CEUS SSC model that is widely applicable to the entire CEUS and will be used by DOE to update probabilistic seismic hazard analyses (PSHAs) at several DOE sites during the next few years.

**Probabilistic Seismic Hazard Analysis for SRS and Hanford.** The Board reviewed activities associated with updating the PSHAs at SRS and Hanford. The Board reviewed seismic source and ground motion inputs being used by DOE to update the SRS PSHA and is working with DOE to ensure that all technical issues are resolved prior to the final report, anticipated early in FY 2013. The Board participated in the kick off meeting and first workshop to update the Hanford PSHA, which is scheduled to be completed during the next two years.

**Deficiencies with the SASSI Computer Software.** The DOE complex uses the computer program SASSI (A System for the Analysis of Soil-Structure Interaction) to evaluate interaction effects between nuclear facility structures and supporting soils. In an April 8, 2011, letter to DOE, the Board highlighted its concern that issues with the program could lead to erroneous conclusions that affect the safety-related structural design at DOE defense nuclear facilities. DOE responded to the Board in letters dated July 29, 2011, October 5, 2011, and December 27, 2011. DOE agreed with the Board's concerns and is taking actions to address both technical and quality assurance issues. DOE has developed a SASSI Project Plan and Technical Work Plan that will result in an improved set of SASSI validation and

verification problems. The Board attended a DOE workshop on SASSI and continues to review DOE's efforts to develop an improved set of SASSI test problems. DOE also undertook two quality assurance audits of contractors who execute SASSI. The Board observed these audits and is working with DOE to ensure that all findings and corrective actions are appropriately identified and resolved.

**Periodic Reports to Congress.** The Board issued two periodic reports to Congress on the status of significant unresolved technical differences between the Board and DOE on issues concerning the design and construction of DOE's defense nuclear facilities. These reports have been highly effective in communicating Board concerns to Congress as well as DOE senior management. The reports were issued March 8, 2012 and June 25, 2012.

### Performance Goal 3

**Safety in Nuclear Facilities Design and Infrastructure.** DOE's new defense nuclear facilities and major modifications to existing facilities are designed and constructed in a manner that ensures adequate protection of the health and safety of the public, the workers, and the environment.

#### FY 2011 Performance Accomplishments

**Waste Treatment and Immobilization Plant (WTP) at the Hanford Site.** The Board has continued its review of the design and construction of important-to-safety structures, systems, and components in the Waste Treatment and Immobilization Plant facilities. The Board's activities primarily consisted of the evaluation of emerging issues and the resolution of previously identified issues. Specifically:

- The Board held three separate public meeting and hearing sessions during the period October 7–8, 2010, addressing concerns with pulse jet mixing in WTP vessels, changes in the design basis due to a reduced material-at-risk, and the design basis for hydrogen in pipes and ancillary vessels.
- The Board issued Recommendation 2010-2, *Pulse Jet Mixing at the Waste Treatment and Immobilization Plant*, on December 17, 2010, to address unresolved technical concerns with WTP's mixing and transfer systems.
- The Board identified safety issues in a letter dated April 5, 2011, with the methodology for assessing dose consequences from pressurized spray leaks involving radioactive liquids at WTP.
- The Board identified safety issues in a letter dated May 5, 2011, with the design of instrumentation and control systems for WTP.
- The Board identified safety issues in a letter dated June 27, 2011, with the use of the Low Order Accumulation Model (LOAM) to predict solids accumulation in WTP process vessels.
- The Board identified safety issues in a letter dated August 3, 2011, concerning the heat transfer calculations used to determine when engineered controls would be required to prevent flammable conditions from developing in WTP process vessels.
- The Board identified safety issues in a letter dated September 13, 2011, concerning chemical vapor releases at WTP.

**Integrated Waste Treatment Unit at Idaho National Laboratory.** The Board continued its review of the design and construction of the Integrated Waste Treatment Unit. The Board's most significant activities focused on evaluating the Technical Safety Requirements and Documented Safety Analysis and monitoring implementation of the safety basis. Additionally, the Board evaluated the design of the safety-significant instrumentation and worked with DOE to resolve issues associated with construction completion and system testing.

**Chemistry and Metallurgy Research Replacement (CMRR) Project at Los Alamos National Laboratory (LANL).** In December 2010, the Board learned that LANL requested that NNSA contemplate several changes to the CMRR Nuclear Facility safety strategy and design. These changes included the elimination of one or more major safety-related systems and revisions to the seismic design requirements for certain safety systems. As a result, the Board sent a letter to NNSA on February 8, 2011, expressing concern that any change to the CMRR Nuclear Facility safety strategy and design must be properly justified and documented. NNSA subsequently informed the Board that major changes to the CMRR Nuclear Facility safety strategy are no longer being pursued.

The Board continued its review of seismic analysis input assumptions and the project approach to soil structure interaction. The Board provided feedback on seismic analysis issues including time history development and the approach to defining foundation input seismic motions. The Board continued its review of the revised CMRR Preliminary Documented Safety Analysis and initiated reviews of updated System Design Descriptions, the facility Process Hazard Analysis, and the analysis to assess habitability concerns with the Entry Control Facility, the location where operators will respond to design basis accidents including earthquakes.

**Radioactive Liquid Waste Treatment Facility Upgrade Project at LANL.** The Board tracked DOE's evaluation of alternatives to reduce project cost. Board oversight activities will continue when NNSA decides upon a path forward.

**Transuranic Waste Facility Project at LANL.** The Board continued its review of the design and safety basis development activities for the Transuranic (TRU) Waste Facility project, focusing on resolution of outstanding safety issues from conceptual design, as well as the development of the preliminary safety design report and preliminary design documents. The Board observed that the project took positive actions during preliminary design to resolve safety issues previously identified by the Board. These actions included relocating the facility to an alternate site where

an aircraft crash event is not credible and modifying accident analysis parameters for the seismic evaluation to comply with DOE technical standards.

**Pit Disassembly and Conversion (PDC) Project at the Savannah River Site (SRS).** The Board reviewed the Safety Design Strategy, the Facility Design Description, the Conceptual Safety Design Report, Hazard Analysis, and the Risk and Opportunity Analysis Report and provided comments to NNSA. Major comments identified involved the potential for seismic soft zones, the development of safety-class gaseous fire suppression systems, the need to consider Seismic Design Category 4 (SDC-4) because of high unmitigated accident consequences, the use of a plutonium storage container as a safety-class component, and the definition of “backfit” process. Even though the PDC project is being redirected, the comments provided should have a timely impact on the revised project. This will allow NNSA to address some major issues early in conceptual and preliminary design.

**Salt Waste Processing Facility (SWPF) at SRS.** The Board reviewed calculations related to the heat-up of the SWPF process vessels including a calculation of the Time-to-Combined Lower Flammability Limit (CLFL). The Time-to-CLFL calculation showed that safety-significant controls are needed to shut down the large recirculation pumps. The SWPF project will utilize high process vessel temperature as the set point for shutting down recirculation pumps and air pulse agitators for selected process vessels. Other smaller pumps that impact vessel heat-up will be shut down manually after loss of cooling caused by an earthquake or other natural event. In addition, the Board obtained agreement from DOE to conduct additional tests to characterize mixing of process tanks, including additional rheology tests and 1/5 scale mixing tests. The testing piggybacked on tests already planned to evaluate an improved material for adsorbing actinides from the high-level salt waste.

**Waste Solidification Building at SRS.** The Board has been following the construction activities at the Waste Solidification Building. The Board reviewed the corrective actions related to an unplanned construction cold joint in the concrete structure. The project took the appropriate actions to repair the structure. The Board is currently working with the Waste Solidification Building project to ensure that appropriate lessons learned are developed and shared with other DOE construction projects.

**Uranium-233 Downblending at Oak Ridge National Laboratory.** The Board reviewed DOE's alternatives analysis process to develop a new pathway for disposal of the U-233 inventory in Building 3019 at Oak Ridge National Laboratory. The downblending project will no longer be accomplished which makes the Board's previous issues with the design no longer relevant. The Board is now reviewing the new plans for U-233 disposition.

**Uranium Processing Facility.** In response to Board concerns that the project's critical decision strategy did not facilitate verification that safety was integrated into the preliminary design, DOE decided to develop preliminary safety documentation along with a detailed safety control set. This information would serve as a technical basis to validate the integration of safety into the preliminary design. The Board identified concerns with the adequacy of the developed control set, and DOE determined that the control set was not adequate. DOE decided that the UPF project would need to fully follow the safety basis development process expected at preliminary design to correct the deficiencies.

The Board also identified safety concerns with the project's safety design strategy and other safety documentation to aid DOE in the development of an acceptable preliminary safety design report. The Board worked closely with the project to review and provide feedback on the calculations being developed that address the geotechnical and structural issues transmitted to DOE on March 15, 2010.

The Board has provided comments related to the long-lead procurement equipment design contracts. These comments are being updated or resolved as the overall facility safety documentation is developed to address the revised equipment requirements.

**Electrical Safety.** The Board reviewed the electrical safety program at the Waste Isolation Pilot Plant (WIPP) and Idaho Nuclear Technology and Engineering Center (INTEC). The Board issued a letter to DOE on September 22, 2010, identifying several areas of the electrical safety program at WIPP which did not meet guidance in DOE's Electrical Safety Handbook (DOE-HDBK-1092-2004). WIPP has subsequently improved its electrical safety program. The Board concluded that the INTEC site-wide electrical safety program appeared adequate and complied with the model provided in DOE's Electrical Safety Handbook with a few exceptions. The staff reviewed and commented on a revision of DOE's electrical safety handbook, expected to be issued by DOE in FY 2012.

**Filter Test Facility.** Nuclear-grade high-efficiency particulate air (HEPA) filters are used in essentially all new DOE nuclear facilities and are tested in the Filter Test Facility to ensure the filters meet performance requirements. DOE

continues to address deficiencies previously identified by the Board at the Filter Test Facility. In particular, the Board continues to monitor DOE corrective actions to address the continuing unacceptably high filter failure rates.

**Central and Eastern United States (CEUS) Seismic Source Characterization (SSC) Project.** The CEUS SSC project is a cooperative effort sponsored by the Department of Energy, the Electric Power Research Institute (as the nuclear industry representative), and the United States Nuclear Regulatory Commission. The Board's staff is participating as a member of the participatory peer review panel.

The final CEUS SSC model shows that locations with geologic and geotechnical evidence of repeated large magnitude earthquakes (magnitude greater than about 6.5) will have significantly higher seismic hazard compared to other seismic sources. Ground motion estimates using the CEUS SSC model are anticipated to show higher seismic hazard at most nuclear facility locations compared to historical probabilistic seismic hazard estimates. This may be significant for SRS, which is about 100 to 150 kilometers from the Charleston seismic source. DOE has deferred the probabilistic seismic hazard analysis update for SRS pending completion of this project.

**Probabilistic Seismic Hazard Analysis for SRS and Hanford.** The Board has been reviewing activities associated with the SRS probabilistic seismic hazard analysis update, which has been deferred pending completion of the CEUS SSC project. The Board participated in the initial discussions at Hanford as DOE decides whether an update to the current probabilistic seismic hazard analysis for Hanford is necessary.

**Deficiencies with the SASSI Computer Software.** The DOE complex uses the computer program SASSI (A System for the Analysis of Soil-Structure Interaction) to evaluate soil-structure interaction effects between nuclear facility structures and supporting soils. In an April 8, 2011, letter to DOE, the Board highlighted its concern that issues with the program could lead to erroneous conclusions that affect safety-related structural design at DOE defense nuclear facilities. DOE agreed with the concerns and is developing corrective actions.

**Periodic Reports to Congress.** The Board issued three periodic reports to Congress on the status of significant unresolved technical differences between the Board and DOE on issues concerning the design and construction of DOE's defense nuclear facilities. These reports have been highly effective in communicating Board concerns to Congress as well as DOE senior management. The reports were issued December 30, 2010, June 15, 2011, and September 23, 2011.



## PERFORMANCE GOAL 4: EFFECTIVE NUCLEAR SAFETY PROGRAMS AND ANALYSIS

<b>Performance Goal 4</b>	<p><b>Effective Nuclear Safety Programs and Analysis.</b> DOE regulations, requirements, and guidance are developed, implemented, and maintained; and safety programs at defense nuclear facilities are established and implemented as necessary to adequately protect the health and safety of the public, the workers, and the environment.</p>
<b>FY 2013 Performance Accomplishments</b>	
<p><b>DOE Directives.</b> As part of its continuing review of new and revised DOE directives, members of the Board’s staff evaluated more than 30 DOE directives including technical standards and NNSA supplemental directives. Members of the Board’s staff provided constructive comments on directives being developed or revised, and evaluated the safety impact for directives that DOE proposed to cancel. Examples of reviews of DOE directives completed in FY 2013 include:</p> <ul style="list-style-type: none"> <li>• DOE Standard 3014-2006, <i>Accident Analysis for Aircraft Crash into Hazardous Facilities</i> (Re-affirmation)</li> <li>• DOE Handbook 3010-94, <i>Airborne Release Fractions/Rates and Respirable Fractions for Nonreactor Nuclear Facilities</i> (Reaffirmation)</li> <li>• DOE Standard 1150-YR, <i>Quality Assurance Functional Area Qualification Standard</i></li> <li>• DOE Standard 1174-YR, <i>Radiation Protection Functional Area Qualification Standard</i></li> </ul> <p>At year’s end, members of the Board’s staff were actively reviewing five revisions or reaffirmations of directives, including DOE Handbook 1132-99, <i>Design Considerations</i>. Members of the Board’s staff were also working to reach resolution of issues regarding revisions or drafts of eight pending directives to improve the content, clarity, and consistency of safety requirements and guidance. These directives include draft DOE Standard 3009-YR, <i>Criteria and Guidance for Preparation of U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analysis</i>, and draft DOE Standard, SAFT-0132, <i>Probabilistic Risk Assessment for Nuclear Safety Applications</i>.</p> <p><b>Integrated Safety Management.</b> In August 2012, the Board issued technical report DNFSB/TECH-37, <i>Integrated Safety Management at the Activity Level: Work Planning and Control</i>. DNFSB/TECH-37 concluded that there was a lack of comprehensive requirements and guidance within DOE’s directives system governing ISM at the activity level, and a lack of DOE and contractor oversight in this functional area. In October 2012, the Board’s staff provided feedback to DOE during development of its response that DOE’s planned actions did not include development of comprehensive guidance on contractor implementation of ISM at the activity level. Following this interaction, DOE submitted its response to DNFSB/TECH-37 that included actions to develop new and revised DOE directives providing comprehensive guidance on contractor implementation of ISM at the activity level, as well as on contractor and DOE oversight in this area. Per this response, DOE conducted a complex-wide workshop on ISM at the activity level to gain insights for the new guidance and has initiated an internal review of the new and revised DOE directives.</p> <p><b>Conduct of Operations.</b> The Board’s staff performed follow-up reviews in FY 2013 of the maintenance programs at the Waste Isolation Pilot Plant (WIPP) and the Waste Encapsulation and Storage Facility (WESF) at Hanford to validate that safety concerns noted in prior Board letters had been resolved. The Board’s staff noted improvements at WIPP in the post maintenance testing documentation, pre-job briefings, safety system walkdowns, and execution of maintenance activities. However, some weaknesses remain with respect to the quality of the work documents. Although the Board’s staff noted some opportunities for improvement, significant progress was evident at WESF in the areas of maintenance training, periodic inspections of design features, contractor oversight of maintenance, and execution of work. The Board’s staff communicated its observations related to operational activities at WIPP and WESF to key site personnel and will continue to evaluate DOE’s efforts to improve conduct of operations and maintenance throughout the complex.</p> <p><b>Emergency Management.</b> The Board’s staff continued to review emergency management programs at DOE sites with defense nuclear facilities. Key areas of concern included the ability of these programs to address severe events, multi-facility impacts, cascading or “connected” events, loss of utilities and supporting infrastructure, and the coordination of DOE and local response resources. The Board’s staff conducted reviews of emergency management programs and the ability of DOE sites to respond to emergency events including severe events at Pantex, LANL,</p>	

LLNL, Hanford, SNL, Y-12, and SRS. Emergency preparedness, response, and recovery at the Pantex site were key topics at the Board's public meeting/hearing held in Amarillo, TX, on March 14, 2013.

**Federal Technical Capability Program (FTCP).** The Board's staff participated in FTCP meetings and activities during FY 2013 to ensure DOE maintained a competent and highly capable federal workforce at its defense nuclear facilities. The Board's staff reviewed all newly issued and revised Functional Area Qualification Standards and provided extensive feedback to DOE on proposed safety improvements. DOE accepted many of the Board staff's comments that will ensure duties and responsibilities of site oversight personnel and the competencies documented in the Functional Area Qualification Standards are focused on technical and safety-related matters. In addition, an issue previously raised by the Board related to a lack of federal training on the human factors safety management program was resolved during FY 2013 with the development and implementation of a course at the National Training Center.

**Facility Representative Program.** The Board's staff ensured that the DOE facility representative program remained vibrant through participation in monthly meetings, periodic assessments, and working interactions with facility representatives during site visits. The Board's staff participated in facility representative program assessments at the Nevada Site Office and the Pantex NNSA Production Office and provided input to improve the assessment process.

**Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls.*** The Board's staff continued to follow DOE's efforts to verify the implementation of Recommendation 2002-3. DOE recently completed all of the commitments in its Implementation Plan for the Recommendation. The Board is reviewing closure of Recommendation 2002-3.

**Recommendation 2009-1, *Risk Assessment Methodologies at Defense Nuclear Facilities.*** The Board continued to monitor DOE's efforts in implementing Recommendation 2009-1 which identified the need for policies and guidance on the use of quantitative risk assessment methodologies at DOE defense nuclear facilities. DOE has shown a recent and renewed interest in applying risk assessment technology in nuclear safety applications. In this regard, members of the Board's staff reviewed DOE's proposed Standard on the use of risk assessment. The Board will continue to work toward improving DOE's safety posture with respect to the use of risk assessment methodologies.

**Recommendation 2010-1, *Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers.*** DOE has been working diligently on executing the Implementation Plan for Board Recommendation 2010-1. However, completion of this Implementation Plan proved to be more time consuming than DOE originally planned, and the schedule has been extended. DOE continues to work to make significant revisions to five essential DOE Standards that support implementation of DOE's Nuclear Safety Management Rule, 10 CFR Part 830. The Board's staff reviewed a draft of the first such Standard (DOE-STD-3009) and provided DOE with a significant number of comments to ensure consistency with the DOE Implementation Plan, as well as ensure that the workers and the public are adequately protected through a comprehensive set of clear and unambiguous requirements.

## Performance Goal 4

**Effective Nuclear Safety Programs and Analysis.** DOE regulations, requirements, and guidance are developed, implemented, and maintained; and safety programs at defense nuclear facilities are established and implemented as necessary to adequately protect the health and safety of the public, the workers, and the environment.

### FY 2012 Performance Accomplishments

**DOE Directives.** As part of its continuing review of new and revised DOE directives, the Board evaluated more than 30 DOE directives including technical standards and NNSA supplemental directives. The Board provided constructive comments on directives being developed or revised, and evaluated the safety impact for directives that DOE proposed to cancel. Examples of reviews of DOE directives completed in FY 2012 include:

- DOE Order 420.1C, *Facility Safety*
- DOE Guide 420.1-1A, *Nonreactor Nuclear Safety Design Guide for Use with DOE O 420.1C, Facility Safety*
- DOE Guide 226.1-2, *Federal Line Management Oversight of Department of Energy Nuclear Facilities*
- DOE Standard 1066-YR, *Fire Protection*
- DOE Standard 1212-YR, *Explosives Safety*
- DOE Handbook 1092-YR, *Electrical Safety*

At year's end, the Board was in the process of resolving issues regarding revisions or drafts of nine pending directives to improve the content, clarity, and consistency of safety requirements and guidance. These directives include a proposed revision of DOE Standard 3009-94 Change Notice 3, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*, and draft DOE Standard 1020, *Natural Phenomena Hazards Analysis and Design Criteria for DOE Facilities*.

**Readiness Reviews.** The Board evaluated Startup Notification Reports for defense nuclear facilities under its cognizance. The Board reviewed plans of action and implementation plans for the proposed startup and restart of defense nuclear facilities, and the Board reviewed startup and restart activities accordingly. Additionally, the Board continued to review DOE site offices' and contractors' local implementing procedures for DOE Order 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities*, which requires site offices and contractors to develop local implementation procedures for readiness reviews. The Board provided constructive critiques of the local implementation procedures in an attempt to ensure clarity and consistency with DOE Order 425.1D and DOE Standard 3006-2010, *Planning and Conducting Readiness Reviews*.

**Conduct of Operations.** The Board reviewed conduct of operations at Hanford's Plutonium Finishing Plant and Tank Farms, as well as the Pantex Plant, and the maintenance programs at the Waste Isolation Pilot Plant (WIPP) and the Pantex Plant in FY 2012. The Board noted weaknesses in the quality and use of technical procedures, supervisory control of work activities, and execution of work. The Board formally communicated its concerns related to activities at Hanford and WIPP and will continue to evaluate DOE's efforts to improve conduct of operations and maintenance throughout the complex.

**Federal Technical Capability Program (FTCP).** The Board participated in FTCP meetings and activities during FY 2012 to ensure DOE maintained a competent and highly capable federal workforce at its defense nuclear facilities. The Board reviewed and commented on the FTCP's FY 2012 Operational Plan and provided input on potential enhancements to the Functional Area Qualification Standards, including expanding the depth and applicability of human factors competencies to a broader range of functional areas and reinforcing the need to focus on technical objectives, not administrative functions. The Board reviewed all newly issued and revised Functional Area Qualification Standards and provided extensive feedback to DOE on proposed improvements.

**Recommendation 2002-3, Requirements for the Design, Implementation, and Maintenance of Administrative Controls.** The Board followed DOE's efforts to verify the implementation of Recommendation 2002-3. During this fiscal year, the Board monitored onsite reviews at NNSA sites including LLNL, LANL, SNL, and Pantex. During the previous year, EM had completed a series of similar implementation reviews. DOE is in the process of integrating the results of these field reviews to determine whether sufficient justification exists to seek closure of the Board's recommendation.

**Recommendation 2004-2, Active Confinement Systems.** During FY 2012, Savannah River National Laboratory initiated several modifications to facility ventilation systems to address deficiencies identified as a result of the Board's Recommendation 2004-2. The Board also reviewed the laboratory's plans for addressing the highest priority deficiencies.

**Recommendation 2009-1, Risk Assessment Methodologies at Defense Nuclear Facilities.** The Board continued to monitor DOE's efforts in implementing Recommendation 2009-1. The Board's recommendation identified the need for adequate policies and associated standards and guidance on the use of quantitative risk assessment methodologies for safety applications at DOE defense nuclear facilities. DOE has developed a draft Standard on the use of Probabilistic Risk Assessment in nuclear safety applications. The Board has been actively involved in encouraging DOE to seek opportunities for pilot application of the draft Standard. The Board will continue to work toward improving DOE's safety posture with respect to the use of risk assessment methodologies.

**Safety System Design, Functionality, and Maintenance.** During this fiscal year, the Board continued to conduct reviews of the design, functionality, and maintenance of safety systems at defense nuclear facilities and to follow up on previously identified issues. Examples of reviews conducted this year include detailed follow-up reviews related to safety system and control adequacy at LLNL and the Hanford Tank Farms. The Board's reviews have resulted in a number of hardware changes and significant commitments from DOE. The Board will continue to follow DOE's efforts to implement the changes associated with the Board's findings.

**Oversight of Safety Basis Requirements.** The Board engaged in significant efforts to improve DOE's system of safety basis requirements through the implementation of the Board's Recommendation 2010-1, *Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers*. The Board participated in several industry-wide workshops and evaluated DOE's efforts to revise DOE Standard 3009-94. The Board conducted extensive review and provided significant commentary to DOE in an effort to improve the standard. The Board is concerned that some of the proposed revisions to this vitally important guidance represent a relaxation or departure from longstanding safety principles. The Board will continue to closely monitor DOE's efforts to revise this standard and implement Recommendation 2010-1.

**Emergency Management.** The Board continued to pursue its review of emergency management programs at DOE sites with defense nuclear facilities. Key areas of concern included the ability of these programs to address severe events, multi-facility impacts, cascading or "connected" events, loss of utilities and supporting infrastructure, and the coordination of DOE and local response resources. Emergency preparedness, response, and recovery at LANL were key topics at the Board public meeting/hearing held in Santa Fe, NM, on November 17, 2011. The Board conducted reviews of emergency management programs and the incorporation of lessons learned from major accidents such as the tsunami impacts on Japan's Fukushima Daiichi nuclear power station into the programs at LANL, Hanford, and Y-12.

## Performance Goal 4

**Effective Nuclear Safety Programs and Analysis.** DOE regulations, requirements, and guidance are developed, implemented, and maintained; and safety programs at defense nuclear facilities are established and implemented as necessary to adequately protect the health and safety of the public, the workers, and the environment.

### FY 2011 Performance Accomplishments

**DOE Directives.** As part of its continuing review of new and revised DOE directives, the Board evaluated the DOE 2010 Safety and Security Reform Plan, which commenced on March 16, 2010. As a result of the 2010 Safety and Security Reform Plan, the Board evaluated more than 50 DOE directives including technical standards and NNSA supplemental directives. The Board provided constructive comments on directives being developed or revised, and evaluated the safety impact for directives that DOE proposed to cancel. Examples of reviews of DOE directives completed in FY 2011 include:

- DOE Policy 420.1, *Department of Energy Nuclear Safety Policy*
- DOE Policy 450.4A, *Integrated Safety Management Policy*
- DOE Order 450.2, *Integrated Safety Management*
- DOE Policy 226.1B, *Department of Energy Oversight Policy*
- DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*
- DOE Order 414.1D, *Quality Assurance*
- DOE Order 252.1, *Technical Standards Program*
- DOE Order 442.2, *Differing Professional Opinions for Technical Issues Involving Environment, Safety and Health*
- DOE Standard 1195-2011, *Design of Safety Significant Safety Instrumented Systems Used at DOE Non-Reactor Nuclear Facilities*

At year's end, the Board was in the process of resolving issues regarding revisions or drafts of 18 pending directives to improve the content, clarity, and consistency of safety requirements and guidance. These directives include draft DOE Order 420.1C, *Facility Safety*, draft DOE Guide 420.1-1A, *Nonreactor Nuclear Safety Design Criteria and Guide for use with DOE O 420.1, Facility Safety*, and draft DOE Guide 421.1-2, *Implementation Guide for Use in Developing Documented Safety Analyses to Meet Subpart B of 10 CFR 830*. As a result of DOE's proposed revisions to these directives, the Board expects that DOE technical standards will need to be revised to ensure consistency and clarity of requirements and guidance. Examples of these DOE technical standards include DOE Standard 1066-99, *Fire Protection Design Criteria*, and DOE Standard 1020-2002, *Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities*.

**Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant.*** The Board issued this Recommendation 2011-1 on June 9, 2011, following an investigation that revealed a chilled atmosphere adverse to safety as well as suppression of technical dissent. On June 30, 2011, the Secretary of Energy responded by affirming the importance of a robust safety culture and identifying several near-term actions to improve the safety culture on the project and to evaluate safety culture at other sites and projects, but disagreed with some of the Board's findings. The Board provided additional detail to the Secretary of Energy in a letter on August 12, 2011, to assist DOE in developing a satisfactory response to the recommendation. On September 19, 2011, the Secretary of Energy provided clarification of his acceptance of the recommendation. The Implementation Plan for this recommendation is due to the Board in January 2012.

**Recommendation 2010-1, *Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers.*** The Board issued this recommendation on October 29, 2010. The Board intended for this recommendation to lead to clear identification of the requirements and criteria that contractors must meet in preparation of documented safety analyses and identification of safety-related controls for protection of the public and the workers, as well as the requirements that the DOE approval authorities must meet prior to giving their approval. DOE agreed that clearer requirements are needed and committed to revising two fundamental standards to provide better guidance. DOE partially rejected this recommendation on February 28, 2011, but committed to submit an Implementation Plan that would meet the intent of the recommendation. The Board received the DOE Implementation Plan on September 26, 2011, and is assessing whether it meets the intent of the Board's recommendation.

**Recommendation 2009-1, *Risk Assessment Methodologies at Defense Nuclear Facilities.*** The Board's recommendation identified the need for adequate policies and associated standards and guidance on the use of quantitative risk assessment methodologies for safety applications at DOE defense nuclear facilities. During this fiscal year, the Board followed DOE's efforts to implement the recommendation. DOE issued a complex-wide Information

Notice that discusses permitted uses of risk assessment under existing policy and guidance and the need for effective quality assurance. Further, DOE chartered a risk assessment working group and completed studies on the use of risk assessment in the DOE and other government agencies. DOE also issued a new Nuclear Safety Policy and developed a draft standard on the use of probabilistic risk assessment in nuclear safety applications.

**Recommendation 2007-1, *Safety-Related In Situ Nondestructive Assay of Radioactive Materials.*** The Board continued to evaluate DOE's progress in implementing Recommendation 2007-1. Although responsibility for this recommendation was transferred from the DOE Office of Environmental Management to NNSA, milestones from the implementation plan continued to be met, including development of an action plan to address gaps in training and qualification, equipment capabilities, directives, research and development, quality assurance, and oversight.

**Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations.*** All commitments made in the DOE Implementation Plan responding to Recommendation 2004-1 were due to be accomplished by 2009. Although one commitment was closed this year, several commitments were late or had no discernible response from DOE. The Board was concerned that some previous improvements had degraded as result of changes in directives, management/oversight approach, and/or neglect. To address these concerns, the Board held a public hearing and meeting on the efficacy of DOE's safety oversight on May 25, 2011. This public meeting and hearing was the third in a series, and examined federal safety management and oversight policies being developed. Senior DOE and NNSA leadership confirmed their ongoing support for and commitment to integrated safety management and shared their vision for oversight across the DOE complex. The public meeting and hearing was effective in heightening the awareness of senior DOE and NNSA leadership to the need for maintaining effective safety management and oversight systems for defense nuclear facilities. The Board will continue to conduct reviews related to key aspects of this recommendation.

**Integrated Safety Management.** In addition to oversight activities related to Recommendation 2004-1, the Board continued its reviews of DOE's implementation of ISM and associated nuclear safety programs. The Board commented on revisions to the ISM Policy and Guide, and on the newly developed ISM Order. The Board observed that these revisions reduced the requirements and guidance developed during 15 years of implementing ISM systems. Continued DOE efforts are necessary to maintain ISM systems and ensure continuous improvement across the complex. The Board reviewed the effectiveness of the implementation of ISM in activity-level work planning processes at three sites. The reviews revealed shortcomings in the implementation of the ISM programs at Washington Closure Hanford, Nevada National Security Site, and Y-12 National Security Complex at the activity level. In all cases, weaknesses were identified in the processes used to analyze activity-level hazards and to provide adequate controls to ensure worker safety. In response to the Board's reviews, the DOE contractor URS Global Management and Operations Services developed a work planning standard that is now implemented at five DOE defense nuclear facilities. Additionally, the Energy Facility Contractors Group in concert with DOE and NNSA is tailoring the URS standard so that it can be used at all DOE sites operating defense nuclear facilities.

**Leading Indicators for Safety Performance.** During the last several years, DOE and its contractors have worked to develop and maintain performance-based contractor assurance systems. These systems are typically large databases of performance metrics selected to monitor contractor performance in satisfying DOE's contractual expectations. With the Board's encouragement, DOE and its contractors are beginning to consider whether data in those systems may provide leading indicators for facility safety programs. The Board has suggested a methodology for identifying and using leading indicators for facility safety programs and will continue to encourage DOE and its contractors in their efforts.

**Nuclear Criticality Safety.** The Board followed progress made by DOE contractors on nuclear criticality safety issues identified in previous years, specifically at the Y-12 National Security Complex and Los Alamos National Laboratory. The Board reviewed nuclear criticality safety evaluations from several sites, including the Nevada National Security Site, Los Alamos National Laboratory, Y-12, Savannah River Site, and Hanford. The Board also reviewed the technical basis for not requiring a criticality alarm system at Device Assembly Facility at the Nevada National Security Site. The Board continued to evaluate complex-wide activities as described in DOE's annual report on criticality safety. Each of these reviews confirmed that the various criticality safety programs and associated documentation were adequate, but the Board noted several opportunities for improvement and communicated them to DOE and its contractors.

**Readiness Reviews.** The Board evaluated Startup Notification Reports for defense nuclear facilities under its cognizance and reviewed startup and restart activities accordingly. Additionally, defense nuclear sites started implementing DOE Order 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities*, which requires

site offices and contractors to develop local implementation procedures for readiness reviews. The Board started reviewing local implementation procedures in FY 2011 and expects to continue reviewing the local procedures. The Board provided constructive critiques of the local implementation procedures in an attempt to ensure clarity and consistency with the requirements in DOE Order 425.1D and the guidance in DOE Standard 3006-2010, *Planning and Conducting Readiness Reviews*.

**Conduct of Operations.** The Board reviewed conduct of operations and maintenance at three Hanford facilities, the Idaho National Laboratory, and the Y-12 National Security Complex in FY 2011. The Board noted weaknesses in the quality and use of technical procedures, supervisory control of work activities, and execution of work. The Board formally communicated its concerns on Hanford and Y-12 and will continue to evaluate DOE's efforts to improve conduct of operations throughout the complex.

**Justifications for Continued Operations.** The Board continues to review DOE's processes and practices associated with the use of justifications for continued operations (JCOs) at defense nuclear facilities. Previously, the Board found a number of weaknesses in the JCO process and its implementation at defense nuclear facilities. In response to the Board's concerns, DOE developed and promulgated new and improved guidance in this important safety basis area. The Board continues to assess DOE's implementation of JCOs via the Unreviewed Safety Question (USQ) process. The most recent example involves the review of the JCO for structural vulnerabilities at LANL's Plutonium Facility. The Board will closely follow the implementation and effectiveness of the improved guidance.

**Safety System Design, Functionality, and Maintenance.** During this fiscal year, the Board continued to conduct reviews of safety system design, functionality, and maintenance at defense nuclear facilities and to follow up on previously identified issues. Examples of reviews conducted this year include safety system and control adequacy assessments of the Tritium Facility at Lawrence Livermore National Laboratory and the Hanford Tank Farms. A number of important safety issues were identified during these reviews and communicated to DOE for resolution. As a result of these interactions, several engineered systems were identified for upgrades to their safety classification.

**Federal Technical Capability Program (FTCP).** The Board participated in FTCP meetings and activities during FY 2011 to ensure DOE maintained a competent and highly capable federal workforce at its defense nuclear facilities. The Board reviewed the FTCP's FY 2011 Operational Plan and provided input on potential enhancements to the Functional Area Qualification Standards, including expanding the depth and applicability of human factors competencies to a broader range of functional areas. The Board also reviewed all newly issued and revised Functional Area Qualification Standards and provided feedback to DOE on ways to improve them.

**Quality Assurance.** The key quality assurance activity of the Board was reviewing DOE's revised directive on quality assurance. The revised order is stronger and clearer than the previous version. The Board continued to encourage and provide timely feedback to the efforts of DOE to improve awareness and performance in the areas of commercial grade dedication, suspect/counterfeit items, software quality assurance, and overarching quality assurance programs. The Board conducted five reviews in 2011 in multiple quality assurance areas. The Board issued a letter in April 2011 underscoring the software quality assurance issues with a soil-structure interaction model used to assess the seismic response of defense nuclear facilities.

**Safety Culture Improvement Project.** Since FY 2008, DOE and its contractors have worked to develop tools for assessing and improving the safety culture of the federal and contractor workforces. In FY 2009 and early FY 2010, the tools developed by the task team were piloted at several DOE sites, and lessons learned were incorporated into the tools. Two recurring observations from the pilot efforts were that safety culture improvement must be a long-term initiative, and that a cadre of personnel knowledgeable on safety culture should be available to advise and support the sites during their efforts. In FY 2011, the Board identified significant deficiencies in safety culture at the Waste Treatment and Immobilization Plant that resulted in issuance of Recommendation 2011-1, *Safety Culture at Waste Treatment and Immobilization Plant*, as noted above. Implementation of this recommendation is expected to assist DOE in identifying other facilities and activities needing improvements in safety culture.

## **PERFORMANCE GOAL 5: MANAGEMENT EXCELLENCE**

The Board will strive for management excellence throughout its technical, legal, and administrative staffs.

**OUTCOME:** There will be public confidence that DOE defense nuclear facilities are being operated safely and that the Board's oversight is a positive influence on the safe execution of these activities.

### **FY 2013 Management Excellence Performance Accomplishments**

**Performance Goal 5.1: The Board will keep Congress informed on current health and safety issues at DOE defense nuclear facilities and the status of progress toward issue resolution.**

- The Board submitted to Congress its 23<sup>rd</sup> Annual Report for Calendar Year 2012 on February 28, 2013. As required by 42 U.S.C. § 2286e(a), this report describes the Board's current safety initiatives and assesses improvements in the safety of DOE defense nuclear facilities as well as safety problems yet to be resolved.
- On December 24, 2012, and July 15, 2013, the Board provided two periodic reports to Congress and DOE on the status of significant unresolved technical issues concerning the design and construction of DOE's defense nuclear facilities. These periodic reports built on earlier reports to summarize the status of issues previously raised and identified new issues associated with the relevant projects.
- As required by the NDAA for FY 2013, on February 14, 2013, the Board issued its Report to Congress on the Board interpretation of "Technical and Economic Feasibility."

**Performance Goal 5.2: The Board will inform the public of issues related to health and safety at defense nuclear facilities.**

- During FY 2013, the Board posted numerous documents to the public website to include the Board's Annual Report, Periodic Reports, weekly Site Representative Reports, letters to DOE regarding safety issues, Board recommendations, Federal Register notices, and notices of Board hearings. The standard was met for posting documents to the public website within 2 working days of the publication date.
- On October 2, 2012, the Board held a public hearing in Knoxville, Tennessee, on factors that could affect the timely execution and safety of the UPF Project. The hearing was made publicly available via a live video stream on the Board's website.
- On March 14, 2013, the Board held a public hearing in Amarillo, Texas, on safety culture and the status of emergency preparedness at the Pantex Plant. The hearing was made publicly available via a live video stream on the Board's website.

**Performance Goal 5.3: The Board will adopt and execute processes and procedures with DOE that are compatible with the Board's enabling legislation and further the Board's mission.**



- The Board received briefings on issues by senior DOE officials from the Office of Environmental Management and NNSA in order to continue the dialogue on public health and safety at DOE defense nuclear facilities.
- On August 15, 2013, the Board issued Policy Statement 5, *Policy Statement on Assessing Risk*, which establishes the approach the Board will take to assess risk when making recommendations to the Secretary of Energy.

**Performance Goal 5.4: The Board will implement internal processes and procedures that effectively support the Board’s oversight operations and responsibilities as a Federal agency using OMB and OPM management guidance applicable to small agencies to gauge performance.**

- The Board planned, organized, and held training for Board executives on the new Senior Executive Service (SES) performance system, with an emphasis on how to develop performance plans (including performance standards) that meet OPM requirements for system certification.

**Performance Goal 5.5: Appropriate technical and professional expertise will be recruited and/or trained by the Board to accomplish the mission.**

- The Board continued its recruitment of highly-qualified technical personnel and was able to achieve its goal of utilizing at least 95% of its budgeted FTEs, despite absorbing an 8% reduction to its enacted appropriation as a result of sequestration.

**Performance Goal 5.6: The Board will effectively manage the appropriated financial resources, and exercise responsible stewardship over its resources to meet its needs and accomplish the mission.**

- The Board achieved its seventh consecutive unqualified audit opinion on its FY 2012 financial statements from an independent auditor, as required by the Accountability of Tax Dollars Act of 2002. The auditor found that the Board complied with all applicable federal laws and regulations and had no material weaknesses in its internal controls.

**Performance Goal 5.7: The Board will assign staff to be in residence at selected sites.**

- The Board enhances its on-site safety oversight of DOE defense nuclear facilities by assigning experienced technical staff members to full-time duty at priority DOE sites. Ten full-time site representatives are stationed at five DOE sites: (1) Pantex Plant to oversee nuclear weapons activities, including the weapons stockpile stewardship and weapons disassembly programs; (2) Hanford Site to monitor waste characterization and stabilization and facility deactivation; (3) Savannah River Site to monitor DOE’s efforts to deactivate facilities, stabilize waste materials, and store and process tritium; (4) Oak Ridge’s Y-12 National Security Complex to monitor safety and health conditions at Y-12 and other defense nuclear facilities in the area; and (5) LANL to advise the Board on overall safety and health conditions at LANL, and to participate in Board reviews and evaluations related to the design, construction, operation, and decommissioning of LANL defense nuclear facilities.

## **FY 2012 Management Excellence Performance Accomplishments**

### **Performance Goal 5.1: The Board will keep Congress informed on current health and safety issues at DOE nuclear facilities and the status of progress toward issue resolution.**

- The Board submitted to Congress its 22<sup>nd</sup> Annual Report for Calendar Year 2011 on February 17, 2012. As required by 42 U.S.C. § 2286e(a), this report describes the Board's current safety initiatives and assesses improvements in the safety of defense nuclear facilities as well as safety problems yet to be resolved.
- On March 7, 2012, and June 25, 2012, the DNFSB provided two quarterly reports to Congress and DOE on the status of significant unresolved technical issues concerning the design and construction of DOE's defense nuclear facilities. These quarterly reports built on earlier reports to summarize the status of issues previously raised and identified new issues associated with the relevant projects.
- On April 17, 2012, the Chairman testified before the House Armed Services Committee, Subcommittee on Strategic Forces regarding "Safety Oversight of Department of Energy Defense Nuclear Facilities."

### **Performance Goal 5.2: The Board will inform the public of issues related to health and safety at defense nuclear facilities.**

- During FY 2012, the Board posted numerous documents to the public website to include the Board's Annual Report, Periodic Reports, weekly Site Representative Reports, letters to DOE regarding safety issues, Board recommendations, Federal Register notices, and notices of Board hearings. The standard was met for posting documents to the public website within 2 working days of the publication date.
- On November 17, 2011, the Board held a public hearing in Santa Fe, New Mexico, on Seismic Safety of the Plutonium Facility, Los Alamos National Laboratory. The hearing was made publicly available via a live video stream on the Board's website.
- On March 22, 2012, in Session I, Parts 1 and 2, in Kennewick, Washington, the Board held a public hearing and received testimony from DOE and its contractors concerning the status of actions related to unresolved technical safety issues in the design of the Waste Treatment and Immobilization Plant. The hearing was made publicly available via a live video stream on the Board's website.
- On May 22, 2012, in Session II, the Board received testimony regarding the status of actions related to DOE's implementation plan for the Board's Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant* at the Board's Headquarters in Washington, DC. The hearing was made publicly available via a live video stream on the Board's website.

**Performance Goal 5.3: The Board will adopt and execute processes and procedures with DOE that are compatible with the Board’s enabling legislation and further the Board’s mission.**

- The Board received briefings on issues by senior DOE officials from the Office of Environmental Management and NNSA in order to continue the dialogue on public health and safety at DOE defense nuclear facilities.

**Performance Goal 5.4: The Board will implement internal processes and procedures that effectively support the Board’s oversight operations and responsibilities as a Federal agency using OMB and OPM management guidance applicable to small agencies to gauge performance.**

- The Board implemented its new DN (Technical) Performance Management system during FY 2012 and began revising its SES Performance Management System during FY 2012 with the goal of achieving full OPM certification during FY 2013.
- The Board developed and posted its Operating Practices and Procedures on the Board’s public webpage and Intranet.
- The Board occupied second place among 35 small agencies in “The Best Places to Work in the Federal Government 2011” list published by the Partnership for Public Service. This ranking is based on data drawn from the Federal Employee Viewpoint Survey, conducted annually by OPM.

**Performance Goal 5.5: Appropriate technical and professional expertise will be recruited and/or trained by the Board to accomplish the mission.**

- The Board continued its recruitment of highly-qualified technical personnel to reach an on-board strength of 116 personnel, with the remaining four vacancies expected to be filled in early FY 2013.
- The Consolidated Appropriations Act of 2012 provided the Board \$29.130 million in new budget authority. The Board effectively managed its appropriated financial resources and received monthly briefings from senior Board staff on the use of these resources.
- The Board achieved its sixth consecutive unqualified audit opinion on its FY 2011 financial statements from an independent auditor, as required by the Accountability of Tax Dollars Act of 2002. The auditor found that the Board complied with all applicable federal laws and regulations and had no material weaknesses in its internal controls.
- The Board hired an advisory and assistance contractor to perform a risk assessment of Board administrative and program activities and develop a draft FY 2013 audit plan.

**Performance Goal 5.7: The Board will assign staff to be in residence at selected sites.**

- The Board enhances its on-site safety oversight of DOE defense nuclear facilities by assigning experienced technical staff members to full-time duty at priority DOE sites. Ten full-time site representatives are stationed at six DOE sites: (1) Pantex Plant to oversee nuclear weapons activities, including the weapons stockpile stewardship and weapons disassembly programs; (2) Hanford Site to monitor waste characterization and stabilization and facility deactivation; (3) Savannah River Site to monitor DOE's efforts to deactivate facilities, stabilize waste materials, and store and process tritium; (4) Oak Ridge's Y-12 National Security Complex to monitor safety and health conditions at Y-12 and other defense nuclear facilities in the area; (5) LANL to advise the Board on overall safety and health conditions at LANL, and to participate in Board reviews and evaluations related to the design, construction, operation, and decommissioning of LANL defense nuclear facilities; and (6) Lawrence Livermore National Laboratory to perform similar advisory and review efforts.
- The Site Representatives Program provides a cost-effective means for the Board to closely monitor DOE activities, and to identify health and safety concerns promptly by having on-site staff conducting first-hand assessments of nuclear safety management at the priority sites to which they have been assigned. Site representatives regularly interact with the public, union members, congressional staff members, and public officials from federal, state, and local agencies.