U.S. Department of
ENERGY

Department of Energy Activities Relating to the Defense Nuclear Facilities Safety Board Fiscal Year 2009

Report to Congress
June 2010

United States Department of Energy
Washington, DC 20585

Message from the Secretary

June 18, 2010

Section 316(b) of the Atomic Energy Act of 1954, as amended, requires the Department of Energy to submit a written report to Congress addressing the Department's activities related to the Defense Nuclear Facilities Safety Board (Board). Enclosed is the calendar year 2009 report entitled *Department of Energy Activities Relating to the Defense Nuclear Facilities Safety Board.*

Highlights of the Department's accomplishments are included in the report's Executive Summary. Additional details, as well as the status of the Department's commitments to the Board, are included in the body of the report.

Pursuant to statutory requirements, this report is being provided to the following Members of Congress:

- **The Honorable Joseph R. Biden, Jr.**
  President of the Senate
- **The Honorable Jeff Bingaman**
  Chairman, Senate Committee on Energy and Natural Resources
- **The Honorable Lisa Murkowski**
  Ranking Member, Senate Committee on Energy and Natural Resources
- **The Honorable Daniel K. Inouye**
  Chair, Senate Committee on Appropriations
- **The Honorable Thad Cochran**
  Ranking Member, Senate Committee on Appropriations
- **The Honorable Byron L. Dorgan**
  Chair, Senate Subcommittee on Energy and Water Development
- **The Honorable Robert F. Bennett**
  Ranking Member, Senate Subcommittee on Energy and Water Development
- **The Honorable Carl Levin**
  Chair, Senate Committee on Armed Services
- **The Honorable John McCain**
  Ranking Member, Senate Committee on Armed Services
- **The Honorable Ben Nelson**
  Chair, Senate Subcommittee on Strategic Forces

- **The Honorable David Vitter**
  Ranking Member, Senate Subcommittee on Strategic Forces

- **The Honorable Nancy Pelosi**
  Speaker of the House of Representatives

- **The Honorable David R. Obey**
  Chair, House Committee on Appropriations

- **The Honorable Jerry Lewis**
  Ranking Member, House Committee on Appropriations

- **The Honorable Peter J. Visclosky**
  Chair, House Subcommittee on Energy and Water Development

- **The Honorable Rodney Frelinghuysen**
  Ranking Member, House Subcommittee on Energy and Water Development

- **The Honorable Ike Skelton**
  Chair, House Committee on Armed Services

- **The Honorable Howard P. McKeon**
  Ranking Member, House Committee on Armed Services

- **The Honorable Jim Langevin**
  Chair, House Subcommittee on Strategic Forces

- **The Honorable Michael Turner**
  Ranking Member, House Subcommittee on Strategic Forces

- **The Honorable Henry Waxman**
  Chair, House Committee on Energy and Commerce

- **The Honorable Joe Barton**
  Ranking Member, House Committee on Energy and Commerce

If you have any questions or need additional information, please contact me or Ms. Betty A. Nolan, Senior Advisor, Office of Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,

Steven Chu

Executive Summary

The Department of Energy (DOE or Department) provides this Annual Report to Congress in accordance with Section 316(b) of the Atomic Energy Act of 1954, as amended [codified at 42 U.S.C § 2286e (b)]. This Annual Report describes the Department's activities during fiscal year (FY) 2009 that are related to the Defense Nuclear Facilities Safety Board (Board), including the Department's key safety initiatives, the status of Board recommendations, and interface activities between the Department and the Board.

Key Safety Initiatives

The Department is implementing multiple initiatives to improve assurance of public health and safety. The DOE Office of Health, Safety and Security (HSS) leads many of the ongoing safety activities and initiatives that are implemented Department-wide. During FY 2009, HSS led the following key safety initiatives:

- The Department developed and implemented training throughout the complex to strengthen the timely and appropriate evaluation of safety considerations and controls for engineering and construction projects, as described in recently issued DOE Standard 1189, *Integration of Safety into the Design Process.* In addition, the Department completed quarterly project reviews to address identified technical issues and coordinated with the Board to provide joint update reports to Congress as requested.

- The Department continued to review and update its safety requirements directives in an effort to simplify and clarify them, reduce any unnecessary burden, and ensure that they fully support effective, efficient, and safe accomplishment of the Department's mission.

- The Department completed, continued, or initiated development of policy directives or standards in key technical areas, including nuclear materials packaging, digital instrument and control, justifications for continued operations, validation of safety controls, and risk assessment for nuclear safety.

- The Department continued its focus on integrated safety management (ISM) as its central framework for completing work while protecting the public, workers, and the environment. Through the ISM Champions Council, the Department's efforts were directed at (1) strengthening safety culture, (2) improving work planning and control, (3) sustaining ISM systems during American Investment and Recovery Act activities, (4) establishing feedback and improvement priorities, and (5) establishing programs that improve employee health and wellness and reduce the health care costs. The FY 2009 ISM workshop, held in Knoxville, Tennessee, in August 2009, was attended by over 900 line managers, safety professionals, presenters and track leads, ISM Champions, and other interested attendees; the workshop provided an excellent forum for exchanging best practices and lessons learned.

- The Department continued its efforts to upgrade the technical and managerial capabilities of its Federal staff responsible for operations and oversight of defense nuclear facilities by upgrading Functional Area Qualification Standards, completing a DOE complex-wide evaluation of safety system oversight, fostering its effective Facility Representatives program, and re-instituting the corporate intern program.

- The Department's Federal Quality Council identified key cross-cutting quality assurance issues and initiated working groups to resolve these issues.

Many other activities and initiatives were led by the Department's program offices for their respective areas of responsibility. In addition to significant gains in project management, safety management, and quality assurance, the DOE Office of Environmental Management (EM) is making significant progress in several key areas, such as nuclear materials disposition, radioactive waste disposal, and facility/site cleanup and closure. Noteworthy EM program accomplishments during FY 2009 include:

- In October 2009, the Department's Office of River Protection passed the halfway point on construction of the Waste Treatment and Immobilization Plant Project (WTP). The WTP overall design is 77 percent complete.

- EM sites completed the transfer of surplus plutonium and plutonium-bearing material in FY 2009, a DOE strategic initiative begun in 2007; all special nuclear material has been shipped to the Savannah River Site (SRS).

- Workers at the Department's Hanford Site finished removing the K East reactor basin on September 9, 2009, meeting an important milestone in the Hanford cleanup. Remediation of the soil underneath the basin began on September 27, 2009, thereby meeting another important milestone. The 1.2-million-gallon basin once held 1,100 tons of spent nuclear fuel, as well as sludge, a byproduct of fuel corrosion during years of storage.

- SRS maintained its accelerated transuranic waste program in FY 2009, with the disposition of 492 cubic meters of legacy transuranic waste and successfully completing 115 shipments to the Waste Isolation Pilot Plant (WIPP), comprising 1,871 drums and 55 standard waste boxes. The 1,000th shipment to WIPP was made on June 3, 2009. Over 30,000 drums have been disposed of since the beginning of the transuranic waste program in 2001.

Noteworthy accomplishments for the National Nuclear Security Administration (NNSA) during FY 2009 include:

- NNSA completed the startup process ahead of schedule for the Highly Enriched Uranium Materials Facility at the Y-12 site. Startup of this facility will allow for significant upgrades in both the safety and security of uranium storage. It will also expedite the elimination of aging nuclear facilities at the Y-12 Site and reduction of the footprint for nuclear activities, improving safety, security, and efficiency at the site.

- NNSA developed specific expectations for implementing DOE Standard 1189-2008, *Integration of Safety into the Design Process*, regarding design criteria for safety structures, systems, and components that are credited as features for preventing or mitigating chemical release accidents initiated by natural phenomena events. These expectations apply to projects and major modifications involving nuclear facilities in the early design stages, specifically the Chemistry and Metallurgy Research building replacement at Los Alamos, the Pit Disassembly and Conversion Facility at SRS, the Radioactive Liquid Waste Treatment Facility upgrade at Los Alamos, and the Uranium Processing Facility projects at the Y-12 site. In 2009, NNSA evaluated implementation during technical independent project reviews.

- NNSA convened the first DOE working group to discuss fire protection of active confinement ventilation systems. The workshop was attended by Departmental and Board staff and industry experts who deliberated on best practices and approaches for the fire protection of nuclear confinement ventilation systems. The workshop resulted in a series of additional discussions, fire testing and research plans, and NNSA supplemental guidance.

- The Chief of Defense Nuclear Safety completed the first series of reviews following up on the initial series of biennial reviews of nuclear safety that were completed in 2007. These biennial reviews are a systematic way for providing credible, value-added information to NNSA line managers on performance in 18 functional areas. Follow-up reviews were tailored to re-evaluate areas where weaknesses were previously identified. In all cases, these reviews indicated overall good performance or improvements in performance.

- NNSA Defense Programs Headquarters office (NA-10) completed its inaugural biennial self-assessment of nuclear safety performance in June 2009. This self-assessment identified that the Defense Programs organization had made significant improvements since the NNSA oversight review in 2007. NA-10 continues to pursue improvements, guided by a September 2009 corrective action plan that addresses issues identified during the self-assessment.

- NNSA responded to the Board in partnership with EM and HSS in developing a guide for conducting implementation verification reviews of safety basis control sets. This guide will standardize processes and increase assurance that safety basis controls are effectively maintaining the safety posture at NNSA facilities.

Status of Board Recommendations

As of the end of FY 2009 (September 30, 2009), the Board had issued 51 recommendations to the Secretary of Energy since it was established in 1988. The Secretary has accepted 47 of the Board's recommendations in their entirety, and accepted 4 with minor exceptions and clarifications. For each accepted recommendation, the Secretary has approved the Department's implementation plan. As of September 30, 2009, 41 of the Board's recommendations have been closed. One recommendation was closed in FY 2009: Recommendation 92-4, *Multi-Function Waste Tank Facility at Hanford.*

The Board issued one new recommendation during FY 2009: Recommendation 2009-1, *Risk Assessment Methodologies at Defense Nuclear Facilities.* The Secretary accepted Recommendation 2009-1 on November 3, 2009, and the Department provided its implementation plan at that time. This plan describes how the Department will enhance DOE-wide understanding of DOE's current policy with regard to quantitative risk assessment at its defense nuclear facilities and determine necessary changes. Revision to the Implementation Plan is being made to address Board comments. After the end of FY 2009, the Board issued one more recommendation in calendar year 2009: Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety*. The Department is evaluating this recommendation and has already taken a number of actions to respond to the concerns raised.

Ten recommendations remained open as of the end of FY 2009. While extensive work continues to address the Board's remaining open recommendations, the Department is making progress on completing the associated implementation plans and has many ongoing safety improvement initiatives,

such as revitalization of ISM and integrating safety into the design process that will further enhance the Department's ability to effectively improve safety at defense nuclear facilities. Further, the Department is continuing to make progress in its efforts to clean up hazardous materials, decommission facilities, and stabilize and consolidate nuclear materials in order to further eliminate or reduce risks.

REPORT TO CONGRESS

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I. Legislative Language

This report responds to legislative language set forth in 42 U.S.C. 2286e, wherein it is stated:

> *"SEC. 316. REPORTS. [42 U.S.C. 2286e]*
>
> *(b) DOE REPORT.__The Secretary of Energy shall submit to the Committees on Armed Services and on Appropriations of the Senate and to the Speaker of the House of Representatives each year, at the same time that the President submits the budget to Congress pursuant to section 1105(a) of title 31, United States Code, a written report concerning the activities of the Department of Energy under this chapter during the year preceding the year in which the report is submitted."*

II. Introduction

The U.S. Department of Energy (DOE) provides this Annual Report to Congress in accordance with Section 316(b) of the Atomic Energy Act of 1954, as amended [codified at 42 U.S.C. § 2286e (b)], to describe the Department's activities in fiscal year (FY) 2009 that are related to the Defense Nuclear Facilities Safety Board. This report represents a transition from calendar-year reporting to fiscal-year reporting; this change is intended to provide the report in a timelier manner to support the annual budget process. Information provided last year for October to December 2008 activities is not duplicated.

The Board is an independent executive-branch agency established by Congress in 1988 to provide advice and recommendations to the Secretary of Energy regarding public health and safety issues at the Department's defense nuclear facilities. The Board reviews and evaluates the content and implementation of health and safety standards and other requirements relating to the design, construction, operation, and decommissioning of the Department's defense nuclear facilities.

Figure 1 on the following page provides the locations of the major Department facilities involved in defense nuclear activities across the United States.

The Board communicates with the Department through a variety of mechanisms, including formal recommendations, formal reporting requirements, letters requesting action and information, letters providing suggestions, letters providing information (e.g., staff trip reports and reports on specific issues), and requests from the Board and its staff for information, public meetings, briefings, discussions, and site visits.

The Department and the Board share the common goal of ensuring adequate protection of public health and safety and the environment at the Department's defense nuclear facilities. To accomplish this goal, the Department's interface policy, which is set out in DOE Manual 140.1-1B, *Interface with the Defense Nuclear Facilities Safety Board*, is to:

- Fully cooperate with the Board
- Provide access to information necessary for the Board to accomplish its responsibilities

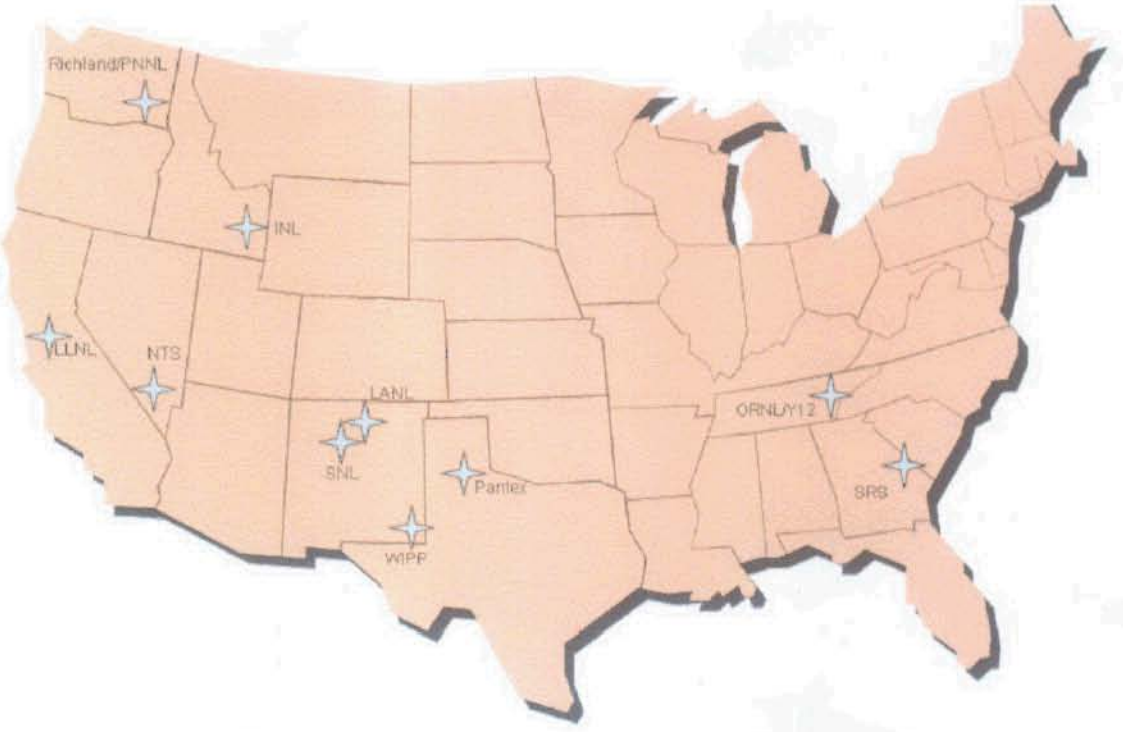

Figure 1. Location of Major Department Defense Nuclear Facilities

- Thoroughly consider the recommendations and other safety information provided by the Board
- Consistently meet commitments made in response to recommendationsof the Board
- Conduct interactions with the Board in accordance with the highest professional standards.

The remainder of this Annual Report is organized as follows:

- Section III, Key Department Safety Initiatives, describes broad-based Departmental activities affecting environment, safety, and health that are of interest to the Board.
- Section IV, Implementation of Board Recommendations, describes Departmental activities completed in FY 2009 to implement Board recommendations accepted by the Secretary of Energy.
- Section V, Other Board Interface Activities, describes Departmental activities to maintain communications and improve interaction between the Department and the Board.

Acronyms and abbreviations appear at the end of this report.

Site-specific activities and accomplishments are provided in a 2009 Supplement to this Annual Report to Congress that can be found on the Departmental Representative's webpage at: http://www.hss.energy.gov/deprep/archive/annlrpts/rpts2con.asp

III. Key Department Safety Initiatives

This section describes key initiatives that the Department is implementing to improve performance in ensuring public health and safety on a DOE- or program-wide basis. These activities address both safety-related issues identified by the Board and findings from self-assessments and independent oversight efforts undertaken by the Department at its defense nuclear facilities. The first six initiatives described below are DOE-wide efforts, led by the Office of Health, Safety and Security (HSS). Following these DOE-wide initiatives, key line program accomplishments by Office of Environmental Management (EM), the National Nuclear Security Administration (NNSA), and their associated safety staffs are described.

A. Early and Effective Integration of Safety into the Design Process

Throughout FY 2009, the Department continued to provide major focus on improving the integration of safety into the design process. HSS worked closely with NNSA and the DOE Offices of Energy, Science, and Management, as well as the Board, to develop training modules for implementing DOE Standard 1189, *Integration of Safety into the Design Process*. HSS also provided training to several DOE sites, including the Los Alamos, Savannah River, and Richland sites.

On September 29, 2006, House Report 109-702, the Conference Report to accompany House Resolution 5122, which became Public Law 109-364, the John Warner National Defense Authorization Act for Fiscal Year 2007, was released and approved by both houses of Congress. The Conference Report requested the Board and DOE to report jointly to the congressional defense committees on their efforts to improve the timeliness of resolution of design issues raised by the Board. On July 19, 2007, the joint report was issued. It identified actions both taken and planned that are intended to promote:

- Early identification of safety requirements and strategies at the conceptual and preliminary design phases of a project

- More effective processes and protocols for communicating issues to the Department and for tracking and managing these issues.

As a result of the joint report, senior Board and DOE staffs met quarterly in FY 2009 to discuss the most significant Board project concerns, to ensure that the issues are understood, and to ensure that appropriate progress is being made toward closure.

B. Review of Safety Requirements and Directives

HSS, in cooperation with the other major offices, continued a significant effort to systematically review the Department's safety directives that are managed by HSS. HSS is responsible for leading the Department's efforts in developing safety-related policy requirements and is responsible for most of the Department's safety directives. This review is being completed in accordance with the requirements of the Department's directives process, defined by DOE Order 251.1C, *Departmental Directives Program*, revised and issued in January 2009.

The review process established for systematic review of the safety directives includes multiple checks and balances, over and above DOE Order 251.1C requirements, to ensure that essential safety requirements are preserved and clarified where needed. Key process attributes include: (1) directives review teams with representatives of all major stakeholders and disciplines, including DOE program

office and field personnel, major contractor representatives, laboratory representatives, and nuclear safety staff members; (2) a central computer database to capture the team's decisions and their bases, including the technical bases for all directives requirements; (3) independent "red teams" to verify that project objectives have been met; (4) a top-level project leadership team (the Directives Review Board, as called for in DOE Order 251.1C) to direct and guide the project and approve the release of directives for DOE-wide review; and (5) the DOE-wide review and approval process, consistent with the approved DOE directives program. In addition, the process includes two separate opportunities to obtain review and input from the Defense Nuclear Facilities Safety Board staff. Eleven directives review teams were established in 2008 and began working on revisions of 12 key safety directives.

In 2009, the Department made significant progress in the systematic review and revision of safety directives managed by HSS. Revisions of safety directives addressing the Department's Federal personnel technical capabilities, nuclear safety management programs, startup and restart of nuclear facilities, and public and environmental radiation protection programs were successfully revised and are in the final stages of formal Departmental review prior to final approval and issuance. These directives include revisions of the following directives:

- DOE Order 426.1, *Federal Technical Capability*, issued in November 2009
- DOE Order 425.1C, *Startup and Restart of Nuclear Facilities*
- DOE Order 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*
- DOE Order 5480.20A, *Personal Selection, Training, Qualification, and Certification for DOE Nuclear Facilities*
- DOE Order 5480.19, *Conduct of Operations Requirements for DOE Facilities*
- DOE Order 5400.5, *Radiation Protection of the Public and the Environment.*

Many of these safety directives have not been updated in more than a decade. As this project moves forward, the Department expects to realize the ultimate benefits of this effort: improved clarity and bases for directives, improved ownership and understanding of directives, and re-emphasis of the importance of these safety requirements throughout the DOE complex.

The Department did not initiate any new directives revisions under this project during 2009 because the Department was performing an internal re-examination of its overall regulatory approach. After the end of FY 2009, this internal review was completed with issuance of the desired end-state for safety regulation. FY 2010 is expected to see strong and continued focus on ensuring that the Department's health, safety, and security requirements are appropriate and add value to effective mission accomplishment.

C. Integrated Safety Management (ISM) Activities

The Department remains committed to ISM as its central framework for completing work while protecting the public, workers, and the environment. ISM is the foundation of the Department's effort to improve safety performance and sustain a robust and effective safety culture. The Department's

top priorities for ISM during FY 2009 and FY 2010 are: (1) strengthening safety culture, (2) improving work planning and control, (3) sustaining ISM during American Reinvestment and Recovery Act (Recovery Act) activities, (4) establishing feedback and improvement priorities, and (5) better integrating employee health and wellness programs into ISM lessons-learned activities. Primary ISM activities and accomplishments in FY 2009 are described below.

ISM Champions. The ISM Champions Council promotes continuous learning and improvement of ISM effectiveness throughout the DOE complex through communications and the sharing of best practices and lessons learned. Under the leadership of the ISM Co-Champions (one from HSS representing institutional and programmatic safety, and one from NNSA representing the line programs), the Department's Champions continue to provide leadership in the program offices, site offices, and contractors. These Champions support line management in developing and sustaining vital, mature ISM systems throughout the Department so that work is reliably accomplished in a safe manner. During FY 2009, the ISM Champions Council conducted periodic calls and meetings to share best practices and lessons learned.

ISM Workshop. The Department held its FY 2009 ISM workshop in Knoxville, Tennessee, in August 2009. The workshop was sponsored by the DOE Oak Ridge Operations Office, the NNSA Y-12 Site Office, and their prime contractors. This workshop was well attended, with over 900 line managers, safety professionals, presenters and track leads, ISM Champions, and other interested attendees, including representatives from other government agencies, academia, and private industry. The theme of "ISM – Reaching New Heights" was selected to appropriately emphasize the Department's efforts to take the ISM system to the next level, thereby strengthening our safety culture through leadership, worker engagement, and organizational learning. The two and a half day workshop featured a number of tracks of presentations on the following topics:

- Safety Culture – Taking ISMS to the Next Level
- Worker Engagement
- Exposure Hazards
- Employee Health and Wellness
- Integration of Safety into Design
- Integrating Safety into Security Operations
- Environmental Protection and Management Systems, "Greening Initiatives"
- Safety of Work Created Under the Recovery Act
- Quality Assurance
- Feedback and Improvement.

Strengthening Safety Culture. In FY 2009, DOE continued to take a number of steps to strengthen safety culture throughout the Department. Specifically, the Department continued its partnership with the Energy Facility Contractors Group to develop a path forward by focusing on three key safety culture areas, identified based on lessons learned from other industries: leadership, employee/ worker engagement, and organizational learning. DOE also made some progress in identifying specific improvement targets and associated behavior expectations; improving performance by developing competence in desired behaviors through training, coaching, and practicing; and ultimately, achieving successful performance and recognition that reinforce the new behaviors and underlying values. In FY 2009, the Department continued to place significant focus on how DOE contractors meet ISM

requirements during the development, implementation, and assessment of the DOE voluntary protection program. Past experience clearly demonstrates that this program is an effective tool for contractors to engage the workers and to improve safety culture. As a result, DOE is continuing to expand participation in this program.

ISM Training. The ISM Champions upgraded and provided ISM training courses to the Senior Technical Safety Managers training program and the Nuclear Executive Leadership Training program during FY 2009. The ISM fundamentals training course was presented in conjunction with the ISM workshop in August 2009.

D. Facility Representative Program Activities

Facility Representatives are highly trained Department employees who provide effective day-to-day oversight of contractor operations at the Department's most hazardous facilities. Approximately 185 Facility Representatives around the complex provide oversight of operational activities important to mission accomplishment and worker and public safety. The Department's standard, DOE Standard 1063-2006, *Facility Representatives*, defines the duties, responsibilities, and qualifications for Department Facility Representatives. The Facility Representative program, managed by HSS, supports Department managers in ensuring that Facility Representatives are competent and technically qualified to perform their jobs. Key components of the program include:

- Complex-wide performance indicator reports provided to the Department's senior managers every quarter since 1999 for evaluation and feedback to improve the program and its implementation
- Designated Facility Representative Steering Committee members and sponsors at each field and major Headquarters program office to serve as management advocates for Facility Representatives
- Periodic conference calls of the Facility Representative Steering Committee to discuss program development and operational oversight issues
- Annual Facility Representatives Workshop to promote the sharing of lessons learned from Facility Representative programs across the complex
- Facility Representative website (http://www.hss.energy.gov/deprep/facrep/) to provide information on the Facility Representative program, qualification standards, vacancy announcements, and other useful information for the Department's Facility Representatives.

Annual Facility Representatives Workshop. The 2009 Annual Facility Representatives Workshop was held in Las Vegas, Nevada, from May 12 to 14, 2009. A total of 131 DOE personnel attended, representing every major program and field office. Included in the total were 59 Facility Representatives, representing over 30 percent of the Department's community of Facility Representatives. The theme of this year's workshop was "Facility Representatives Success Stories." The experience and training obtained by Facility Representatives not only provide them with a solid technical background, but also translate into excellent management skills, making them prime candidates for positions of higher

responsibility both in the field and at DOE Headquarters. The Facility Representatives' presentations on lessons learned and good practices were again a central component of the workshop; a total of 16 Facility Representatives provided presentations on operational, technical, and programmatic topics.

Facility Representative of the Year Award. This award is presented annually to a Facility Representative who demonstrates exceptional performance and who makes exemplary contributions to the safe and efficient operation of Department facilities. The Facility Representative of the Year award was presented at the 2009 Workshop to Mr. Stan Watkins from NNSA's Y-12 Site Office.

Self-Assessment and Continuous Improvement. The Department continued with its efforts to improve the Facility Representative program. Field element managers are tasked with ensuring that periodically (at least every three years) their Facility Representative programs are evaluated by field element self-assessments. During 2009, self-assessments were performed at the Savannah River Operations Office and Y-12 Site Office. These self-assessments evaluated the Facility Representative program in the areas of training and qualification, staffing, effectiveness of oversight, functional support from management, and performance assessments and feedback. Each self-assessment found the Facility Representative programs to be satisfactory, identified opportunities for improvement, and facilitated the development of corrective actions.

In the area of training and qualification, HSS and the Savannah River Site (SRS) funded and developed a two-week classroom course covering the General Technical competencies listed in DOE Standard 1151-2002, *Facility Representative Functional Area Qualification Standard*. The pilot version of the course, delivered in April 2009 at the Savannah River Operations Office, aimed at significantly reducing the time necessary for Facility Representatives to accomplish core qualification. Participating in the pilot version were approximately 15 Facility Representatives undergoing qualification. The course has since evolved into an *Applied Engineering Fundamentals* training course, which is maintained by the DOE National Training Center and is scheduled to be offered in FY 2010.

In August 2009, the Department formed a team to revise DOE Standard 1151-2002 during FY 2010. A revision of DOE Standard 1063-2006 is also expected in FY 2010.

Safety System Oversight. DOE's safety system oversight personnel are responsible for providing oversight of contractors' programs to ensure that critical safety systems will function properly if an accident occurs. Using the results of an analysis published in July 2008, HSS coordinated development of a draft DOE technical standard for safety system oversight program implementation. The draft standard is in review and development and is expected to be issued in mid-2010.

E. Strengthening Quality Assurance

HSS serves as the Department's focal point for quality assurance (QA) programs, processes, and procedures. HSS is responsible for identifying and resolving cross-cutting QA issues and supporting line implementation of policy and requirements for the design, procurement, fabrication, construction, operation, and decontamination/ demolition of Department facilities.

QA Policy and Assistance. The mission of the HSS Office of QA Policy and Assistance, formed in 2008, includes: (1) establishing and maintaining QA policies, requirements, and guidance for the Department; (2) serving as DOE's corporate resource for ensuring that products and services meet or

exceed the Department's quality objectives; and (3) assisting Departmental elements in interpreting and implementing DOE QA requirements and in resolving QA-related issues.

DOE Quality Council. The DOE Quality Council, formed in 2008 and sponsored by HSS, is composed of Federal representatives of DOE Headquarters and field offices across the complex. The Council provides a forum to identify QA policy issues and recommend resolutions. During FY 2009, the Council identified key, cross-cutting QA issues related to QA training; application of the nuclear quality assurance (NQA) standard NQA-1, part 2; integration of QA and ISM; and the survey on QA implementation. The Council established working groups to resolve the identified issues. A pilot QA training for Headquarters organizations has been developed and is undergoing review. Anticipated future activities by the Council will include commercial-grade dedication guidance, graded approach guidance, review of the 2009 addenda to NQA-1, QA metrics, applicability of standard NQA-1 parts 3 and 4, and transition of research and development projects to production. The Council actively works with contractor QA counterparts through the Energy Facility Contractors Group. The Council also served as a peer review group for the draft revision of DOE Order 414.1C, *Quality Assurance*.

Update of the Quality Assurance Order. In June 2008, as part of the review of HSS safety directives, the Department established a team to review and revise DOE Order 414.1C. The revised order will update references to voluntary consensus standards (e.g., to the more recent NQA-1-2008, *Quality Assurance Requirements for Nuclear Facility Applications*); update references to DOE organizations; and strengthen requirements in evolving areas, such as software QA. In addition, the Order promotes combining requirements to help reduce burdens on DOE and contractor staff. In FY 2009, DOE completed development and peer review of the draft Order and expects to provide it for Department-wide review in early 2010, via the RevCom web-based review system.

QA Implementation Survey. The Department surveys and evaluates QA implementation biennially. In FY 2009, the Quality Council revised the survey, issuing it in October 2009. The survey prompts DOE leaders to ensure that management reviews of QA implementation are performed throughout the complex. Further, DOE ensures that the survey evolves to include areas of emerging interest, such as software QA, and training and qualifications. The Department expects to issue the 2009 survey results in mid FY 2010.

Standards Development Organizations. In FY 2009, HSS participated in meetings with the American Society of Mechanical Engineers (ASME)-sponsored NQA Standard Committee to gather information and keep current on ASME NQA national consensus standards and initiatives. HSS is working on several NQA-1 projects, including developing a stand-alone matrix to cross-reference NQA-1 QA requirements to the Department's QA requirements, and developing guidance on QA requirements for commercial-grade items and services. During 2009, HSS also worked closely with the International Atomic Energy Agency on developing a report comparing International Atomic Energy Agency QA requirements and ASME NQA-1 requirements. The final report will aid DOE and its contractors in dealing with international suppliers of items that affect nuclear safety. The report is expected to be published in early FY 2010.

Safety Software Quality Assurance. The Department has made significant enhancements in the rigor and effectiveness of its safety software QA program, which encompasses safety system software, safety and hazard analysis and design software, and safety management and administrative controls software. The Department is pursuing a two-pronged approach for ongoing program enhancements. First, a

Safety Software Expert Working Group was formed and is working with the developers of identified "toolbox" codes to evaluate and qualify the most recent versions of these codes for inclusion in the Central Registry. These toolbox codes are the set of widely-used computer codes that are utilized in safety analyses of nuclear facilities and meet the Department's safety software QA requirements. The Working Group is also conducting similar evaluations of new codes for inclusion in the Central Registry. The interaction with code developers has significantly raised awareness of safety software QA among code developers, with the expectation that the further development of these and other codes will follow rigorous safety software QA procedures. Second, the Department is continuing with the execution of its December 2008 plan for managing the Central Registry, including upgrading the website with an updated list of safety software, monitoring error reporting activities by code users, and developing a communication forum for the exchange of information. The Department's safety software QA procedures for qualifying newer versions of safety software were instrumental in finding hitherto unnoticed errors in one of the toolbox codes that was developed for a non-DOE Federal entity and widely used in the nuclear industry.

High Efficiency Particulate Air (HEPA) Filter Inspection and Testing Program. HSS manages the HEPA filter QA inspection and testing program for the Department. HSS oversees a contractor that provides DOE with the inspection and testing services at their Filter Test Facility. These independent QA inspections and tests of HEPA filters are performed in accordance with DOE and national consensus standards, to ensure that the filters will effectively protect the public, workers, and the environment from radioactive material exposure if called upon. HSS monitors and trends the rejection rates of filters from the Filter Test Facility tests and reports the results. A significant increase in the rejection rates was noted in FY 2007. Based on DOE and Board concerns (in a letter dated March 17, 2008), the Department developed a plan to address the increased rejection rates. This plan outlined several actions that are being taken by the Department and site contractors, in conjunction with the HEPA filter manufacturers, to improve the quality of filters and reduce the high rejection rates. HSS continued in FY 2009 to implement the planned actions, including a review of one of the filter manufacturers. This review identified several actions that will be taken to further reduce the rejection rates, thereby ensuring that high quality filters are received by DOE facilities.

F. Other DOE-wide Safety Initiatives and Activities

In addition to the activities described above, HSS played a key leadership role in improving the Department's nuclear safety posture in FY 2009, as described below.

Nuclear Material Packaging. In FY 2009, the Department continued implementation of the requirements in DOE Manual 441.1-1, *Nuclear Material Packaging Manual*, approved in March 2008, and identifying container needs and designs that can meet the requirements. HSS is working with the line program offices – NNSA, EM, and the Office of Science (SC) – to develop the resource requirements needed to support full implementation.

Application of Safety Instrumented Systems. HSS led an effort to review DOE and other government and industry practices to assess digital instrumentation and control systems, particularly those used in safety systems, to determine whether additional DOE guidance or a DOE standard is warranted to ensure that the unique aspects of digital instrumentation and control are appropriately addressed when designing, maintaining, and operating safety systems. An important aspect of this standard will be incorporation of industry standard ANSI/ASI-84.00.01-2004 (ISA 84), *Functional Safety: Safety*

Instrumented Systems for the Process Industry Sector, tailored to work with DOE's safety analysis approach. HSS, with assistance from a working group consisting of subject matter experts from across the complex, continued development of a draft standard in 2009. The draft standard is being reviewed and tested for its usability and efficacy by the site contractors, and is scheduled for completion in 2010.

Justifications for Continued Operations (JCOs). In FY 2009, the Department's line program offices worked with their site offices to ensure appropriate use of JCOs and limit their duration. JCOs are used to support operations when a nuclear facility deviates from its approved documented safety analysis. HSS, in coordination with the program offices, initiated a revision of DOE Guide 424.1-1A, *Implementation Guide for Use In Addressing Unreviewed Safety Question Requirements,* to better delineate the use of JCOs and to promote more consistent development and use of JCOs across the complex in the future. The revision was coordinated with the DOE's responsible program offices – e.g., EM, SC, NNSA, and the Office of Nuclear Energy (NE) – and its Energy Facility Contractors Group, and is expected to be approved in 2010.

Validation of Safety Controls. In FY 2009, HSS led a Department-wide effort in developing new guidance in this area for incorporation into a revision of DOE Guide 423.1-1, *Implementation Guide for Use in Developing Technical Safety Requirements*, which is expected to be approved in 2010. Before FY 2009, the Department reviewed concerns regarding the adequacy of established safety controls and concluded that existing requirements for implementation of safety controls appropriately focus on holding contractors responsible for proper implementation and validation of controls, but that additional guidance was needed to clarify how to perform initial and periodic validation of safety controls.

Federal Technical Capability Program Activities. The Department is committed to ensuring that employees are recruited, developed, deployed, and retained with full technical capability of performing their duties relative to defense nuclear facilities. The Department's focus on pursuing this objective is facilitated through the Federal Technical Capability Panel, which consists of senior personnel representing the various program and field offices and is currently chaired by NNSA. In FY 2009, the Panel facilitated updating of the workforce analysis for NNSA, EM, SC, HSS, and Headquarters offices; the list of key positions in NNSA, EM, and HSS was prioritized; and staffing plans detailing actions to be taken and due dates for completion were developed. The governing program directive was updated to reflect lessons learned and re-issued as DOE Order 426.1, *Federal Technical Capability*, in November 2009. Four new or revised Functional Area Qualification Standards were published, and work was initiated on updating all the remaining qualification standards that have not been updated in the past five years. The Panel also completed and planned other specific actions as identified in their annual operating plans.

G. EM's Risk Reduction Efforts through Stabilization of Excess Nuclear Materials and Waste

One of the most significant ways that the Department can protect public health and safety is through effective risk reduction and cleanup of legacy wastes. This is the mission of the Department's Office of Environmental Management: risk reduction and cleanup of the environmental legacy of the nation's nuclear weapons program and government-sponsored nuclear energy research. The EM program is one

of the largest, most diverse, and technically challenging cleanup efforts in the world. Three top-level program objectives that establish the framework for carrying out this responsibility continue to be:

1. Safety is the highest priority – no milestone or schedule is worth an employee having a safety incident. EM strives for a zero-accident workplace.
2. Attain and sustain 90 percent of EM's projects performing on cost and on schedule within approved baselines.
3. Develop a higher performing organization through an appropriate organizational structure that focuses on safety, leadership development, and diversity.

In FY 2009, EM made improvement in overall safety performance, as measured by annual occupational injury rates, by reducing the total recordable case (TRC) rate by 9 percent and the days away from work, on-job restriction or transfer (DART) case rate by 26 percent. The EM occupational injury rates continue to remain significantly below comparable private industry rates. EM remained vigilant in identifying emerging safety issues through ongoing awareness and analysis of operational experience and injuries and illnesses, and took action where necessary. For example, EM took action regarding an emerging electrical safety performance trend in the last half of FY 2009 by:

- Directing field sites to implement new provisions in the 2009 National Fire Protection Associations standards
- Developing a criteria review and approach document to evaluate electrical safety practices and directing field sites to implement this document
- Sharing lessons learned from the Oak Ridge arc flash occurrence with EM field managers.

American Reinvestment and Recovery Act. As a result of the Recovery Act, EM was able to seize several opportunities to significantly reduce its lifecycle costs by making upfront investments in core mission activities as described in *Report to Congress: Status of Environmental Management Initiatives to Accelerate the Reduction of Environmental Risks and Challenges Posed by the Legacy of the Cold War* (January 2009). These upfront investments include:

- Near-Term Completion – Accelerating the completion of mission activities at EM's smaller sites and at DOE's national laboratories, thereby allowing EM's remaining work to focus on the larger sites
- Footprint Reduction – Accelerating the completion of environmental (soil and groundwater) remediation and facility deactivation and decommissioning at the larger sites, thereby allowing EM's remaining work to focus on the areas of the site where long-term mission activities still need to be completed
- Solid Radioactive Waste Disposal – Accelerating the disposal of transuranic waste and low-level radioactive waste in an effort to maximize the use of readily available disposal facilities and capabilities.

Specific to the Recovery Act, as EM accelerates cleanup activities, introduces a new workforce, and retrains the existing workforce, the attention to safety on the job is integral and robust from the outset.

In addition to rigorous safety readiness evaluations, EM tracks all safety occurrences and injuries, provides prompt feedback to the field, and shares lessons learned across the complex to prevent future occurrences. EM also continues to emphasize effective work planning and oversight in the field as a key factor in avoiding workplace injuries.

With respect to Recovery Act work, EM has directed its field sites and Headquarters to:

- Perform Federal oversight, including standard site coverage for Facility Representatives, Federal project directors, and others as an element of site oversight of contractor assurance programs for safety management programs.
- Perform contractor oversight to ensure that the work is accomplished within the bounds of the existing ISM system, including safety performance metrics tracking.
- Perform readiness activities specific to Recovery Act work.
- Establish Headquarters oversight site representatives, reporting directly to Headquarters, at each site that receives Recovery Act funds.
- Apply nuclear safety requirements for scope performed within hazard category 2 or 3 nuclear facilities, including nuclear safety rule requirements and DOE Order 425.1C operational readiness requirements, as applicable.

In addition, from the outset of EM's Recovery Act planning, it has been important for EM to ensure that this work is planned and conducted to meet the high safety standards and performance expected within EM, and that safety must be integral and robust from the beginning of this effort. EM expects a rigorous safety infrastructure that ensures implementation of safety management programs, effective safety training, and thorough work planning processes.

EM has been working diligently to ensure alignment and cooperation between the base program and the Recovery Act projects to ensure that effective project management techniques are applied to improve overall project performance and oversight processes. Recovery Act work primarily involves accelerating work that had been planned for out years. Basic planning for these projects had been done, but performance baselines and baseline verifications had not been completed. EM and DOE's Office of Engineering and Construction Management worked together to develop a streamlined approach to establishing and validating project baselines.

In addition to the Recovery Act project work, EM has been improving project management through rigorous reviews of construction projects to improve all areas of project management. These reviews determine, through the use of an independent review committee, whether the scope of the projects, the underlying assumptions regarding technology, project management, cost and schedule baselines, and contingency provisions are valid and credible – within the budgetary and administrative constraints under which DOE functions. The major elements addressed in the reviews are technical disciplines relevant to the project; project management; contract systems; cost engineering; environment, safety, health, and QA; and prior reviews. The following projects were reviewed in 2009:

- Depleted Uranium Conversion Facility at Portsmouth
- Plutonium Preparation and Disposition at SRS

- Waste Treatment and Immobilization Plant (WTP) at the Office of River Protection (ORP)
- Salt Waste Processing Facility at SRS
- Uranium-233 (Building 3019) at Oak Ridge
- Integrated Waste Treatment Unit at Idaho.

Focus on the Waste Treatment and Immobilization Plant. Hanford's WTP project is the largest design, construction, and commissioning project in the Federal sector. When complete and operational, the WTP's facilities for separation, treatment support, and packaging will vitrify (immobilize in glass) radioactive and chemical waste from Hanford's underground tanks. In October 2009, ORP passed the halfway point on construction of the WTP. The WTP's overall design is 77 percent complete.

- With the increased Recovery Act work at Hanford, ORP has performed better than the target TRC rate of less than 1.5 per 100 person-years (200,000 person-hours) and a DART rate of less than 0.7 per 100 person-years.

- The WTP and Tank Farms projects achieved over 1 million hours without a DART.

- The Department's Tank Farms contractor, Washington River Protection Solutions, passed the combined Phase I & II ISM assessments one month ahead of schedule on August 26, 2009. The Department's assessment team concluded that the ISM functions and principles are effectively described in contractor and site office management systems and are effectively implemented.

- The Department's Tank Farms contractor, Washington River Protection Solutions, received Earned Value Management System Certification.

- The Department's WTP contractor, Bechtel National, Inc., achieved voluntary protection program Merit status.

- In FY 2009, ORP developed its Draft Tank Closure and Waste Management Environmental Impact Statement, which was subsequently released for public comment on October 30, 2009. This draft environmental impact statement analyzes alternatives for three types of actions: (1) retrieving and managing waste from 177 underground storage tanks at Hanford and closure of the single-shell tanks; (2) decommissioning of the Fast Flux Test Facility and its auxiliary facilities; and (3) managing solid waste operations on site, including the disposal of Hanford's low-level radioactive waste and mixed low-level radioactive waste and limited volumes of such waste from other DOE sites in an Integrated Disposal Facility at Hanford. DOE will hold public hearings on the draft environmental impact statement in Washington State, Idaho, and New Mexico during the 140-day public comment period.

- ORP's Recovery Act funds are being used to upgrade various Hanford Tank Farms critical operating facilities and infrastructure required to provide consistent and predictable tank waste feed to the WTP. Since April 2009, several Recovery Act projects have been completed, including:

  - Removed and transported the standby diesel-generator from SY Farm to the Environmental Restoration Disposal Facility

- Completed electrical upgrades in SY and AP tank farms
- Removed P-28 exhauster from SY tank farm and packaged it for offsite treatment
- Removed MO-924 office facility from 222-S Laboratory complex
- Completed construction of code-compliant stairwell at 222-S Laboratory
- Achieved 77 percent design complete, 47 percent construction complete, and overall 51 percent complete on WTP.

Other EM Major Accomplishments for 2009. In addition to significant gains in project management, safety management, and QA, EM is making significant progress in several key areas, such as nuclear materials disposition, radioactive waste disposal, and facility/site cleanup and closure. EM did not have any overdue commitments to the Board at the end of the year. Both EM Headquarters and field organizations work aggressively to address the issues that the Board identifies for projects in design and construction in its quarterly report to Congress. Some major accomplishment highlights for 2009 include:

- Waste material was exhumed from the Accelerated Retrieval Project-III in Idaho: 1,092 cubic yards of waste material, for a cumulative 9,872 cubic yards.
- The design effort on the uranium-233 down-blending project at Oak Ridge continued through calendar year 2009. A DOE 60 percent design review was held during the month of September, with observation by Board staff. The review concluded that overall, the uranium-233 project had reached the point of 60 percent design.
- The Transuranic Waste Processing Center at Oak Ridge exceeded the cumulative Site Treatment Plan goal of 587 cubic meters for contact-handled waste processing by processing 274.8 cubic meters of such material in FY 2009. Also, the Central Characterization Project, in cooperation with the Transuranic Waste Processing Center, achieved certification for waste shipments to the Waste Isolation Pilot Plant (WIPP) and completed four TRUPACT II shipments to WIPP in FY 2009.
- The Department and its river corridor cleanup contractor, Washington Closure Hanford, safely completed remediation of one of the most hazardous burial grounds along the Columbia River, the 618-7 Burial Ground.
- The Department completed construction of two new waste disposal cells at the Environmental Restoration Disposal Facility in Richland this year. Each pair of cells is 500 feet wide by 1,000 feet long and 70 feet deep, and has a capacity of 2.8 million tons. With the addition of cells 7 and 8, the capacity of this facility is now about 11 million tons.
- During May 2009, EM initiated work to place the Hanford 105-N Reactor into interim safe storage.

- EM sites completed transfer of surplus plutonium and plutonium bearing material in FY 2009, a DOE strategic initiative begun in 2007. All special nuclear material has been shipped to Savannah River.

The Department retrieved 461 cubic meters of radioactive waste from the low-level Burial Grounds at Hanford and completed the treatment of 1,266 cubic meters of mixed low-level waste.

Workers at the Department's Hanford Site finished removing the K East reactor basin on September 9, 2009, meeting an important milestone in the Hanford cleanup. Remediation of the soil underneath the basin began on September 27, 2009 thereby meeting another milestone. The 1.2-million-gallon basin once held 1,100 tons of spent nuclear fuel, as well as sludge, a byproduct of fuel corrosion during years of storage.

SRS maintained its accelerated transuranic waste program in FY 2009, dispositioning 492 cubic meters of legacy transuranic waste and successfully completing 115 shipments to WIPP, comprising 1,871 drums and 55 standard waste boxes. The 1,000th shipment to WIPP was made on June 3, 2009. Over 30,000 drums have been disposed of since the beginning of the transuranic waste program in 2001.

The Defense Waste Processing Facility at Savannah River produced 196 canisters of vitrified high-level waste glass.

Approximately 1.5 million gallons of salt waste from Tank 50 were processed during calendar year 2009 at Savannah River.

EM completed a major reorganization in 2009 to streamline operations, increase accountability and efficiency, and give field managers more responsibility and accountability in decision-making. The main focus of EM's Headquarters team is being changed from directing activities in the field to assisting the field offices in successfully completing their missions. The plan also aims to strengthen project management. The reorganization made several changes in EM's senior management ranks and at the Deputy Assistant Secretary level.

H. Chief of Nuclear Safety: Support for Energy and Science CTAs

The Department established Central Technical Authority (CTA) positions as part of the Department's implementation plan in response to Board Recommendation 2004-1, *Oversight of Complex, High-Hazard Operations*. The Department has established three CTAs: one in NNSA, one in Energy, and one in Science. The NNSA Principal Deputy Administrator is the CTA for NNSA and is supported by the Chief of Defense Nuclear Safety (CDNS) (see Section II.J). The Under Secretary of Energy is the CTA for Energy, and the Under Secretary of Science is the CTA for Science and are supported by the Chief of Nuclear Safety. The responsibilities of the CTAs, set out in DOE Order 410.1, *Central Technical Authority Responsibilities Regarding Nuclear Safety Requirements*, include:

- Concurrence on changes in the Department's nuclear safety requirements
- Concurrence on exemptions or exceptions from nuclear safety requirements
- Concurrence on nuclear safety requirements in contracts and requests for proposal.

The position of Chief of Nuclear Safety (CNS) was established to ensure the availability of technical expertise and provide operational awareness necessary for the proper implementation of nuclear safety by line management. The CNS and staff enable the Under Secretary of Energy and the Under Secretary for Science to execute their functions as CTAs by maintaining awareness of complex, high-hazard nuclear operations of sites under the cognizance of EM, SC, and NE through such activities as monitoring performance metrics, reviewing site-specific and complex-wide reports and documents, discussing technical issues, and conducting onsite reviews. CNS and staff also support the CTAs in executing their authorities, supporting project and program execution, and sponsoring cross-cutting nuclear safety initiatives. Accomplishments in FY 2009 include the following:

- Line Oversight: The CNS continued to support line oversight activities through nuclear criticality safety program evaluations, operational awareness reviews, programmatic assessments of Federal ISM and construction project reviews, and other means, as described below.

- Field Oversight Activities: In FY 2009, CNS conducted 31 field activity reviews involving the following functional areas: (1) facility safety/authorization basis; (2) nuclear criticality safety; (3) oversight program; (4) seismic safety; (5) project management/construction project reviews; (6) commissioning; (7) ISM; (8) QA; (9) conduct of operations; and (10) decontamination and decommissioning.

- WTP Oversight: CNS staff members worked with ORP at Hanford to support activities necessary to ensure the successful execution of the Department's largest, most complex construction project. Areas reviewed include construction inspection activities, the commercial-grade dedication process, the Nuclear Regulatory Commission report on DOE regulatory processes, the Bechtel WTP contract, the WTP Material-at-Risk Accident Analysis Update Plan, and an issue involving hydrogen in piping and ancillary vessels.

- EM Technical Authority: EM is responsible for managing high-profile, mission-critical projects that require the engagement of multiple technical disciplines at various project phases. These disciplines include, among others, nuclear design, construction, deactivation and decommissioning, groundwater and soil remediation, and stabilization. EM has adopted the Technical Authority framework to effectively manage its technical and safety issues and risks in a forward-looking manner, where the Technical Authority is clearly identified and responsible for technical decision-making. The CNS staff works with EM to develop and implement its Technical Authority Board to advise and integrate functional responsibilities, such as design, engineering, technology, and safety.

- EM Standard Review Plan: The CNS staff continues to assist EM in developing Standard Review Plan modules to provide consistent and rigorous technical guidance to support EM's Critical Decision (CD)-related reviews of new facility projects and to provide technical review strategy and expectations. Thirty-one modules have been developed or revised, and another 19 are being developed for 2010. The overarching concept behind this revision was to enable each module to be tailored to fit the applicable CD phase. New modules cover such topics as seismic design expectations, software QA, and readiness reviews.

- Construction Project Reviews: CNS staff worked with SC and its successful model of project review to enhance the EM capital project review process. In FY 2009, the CNS provided

leadership and technical resources for construction project reviews conducted at the depleted uranium hexafluoride project at Portsmouth, the Plutonium Preparation Facility and Salt Waste Processing Facility projects at Savannah River, the WTP project, and down-blending of uranium-233 in Building 3019 at the Oak Ridge National Laboratory. The key to future success of the construction project reviews program is the development and institution of effective management systems within EM. These reviews have examined critical aspects of project performance, including program management, project management, training and qualification, environmental protection, health and safety, QA, performance management, contract management, and effective use of past experience.

- Code of Record for EM Nuclear Facilities: CNS staff drafted a Code of Record Interim Policy for EM. The Code of Record includes those requirements invoked during the design phase and later used to initiate operations. It is important that these are clearly identified and available to responsible parties during each lifecycle phase, and that they are used to support organizational and mission changes.

- Natural Phenomena Hazard Assessment and Design: In recent years, the Department and its contractors have recognized a need to improve assessment of natural phenomena hazards (such as earthquakes and tornados) to support the design of facilities to withstand them. To address this issue, the CNS established a Seismic Lessons-Learned Panel, including internationally recognized experts, to review the seismic hazard assessments and designs at projects across DOE. In June 2009, the CNS briefed EM senior leaders on seismic hazard assessment and design activities; EM subsequently provided direction to EM field offices reiterating existing DOE requirements for a ten-year review and update of natural phenomena hazards assessments. CNS staff assisted EM sites in responding to this requirement. In addition, the CNS provides funding and leadership to the Central and Eastern United States Seismic Source Characterization project, a broad-based effort that supports the goal of improving natural phenomena hazards performance.

- Quality Assurance: The CNS staff, in partnership with HSS, continued to provide training to the Department's employees for qualification as nuclear QA Lead Auditor. CNS staff led the development of this training, which has been attended by over 150 employees in the last two years; five sessions were offered in 2009. CNS also sponsored three sessions of ASME NQA-1, *Quality Assurance Requirements for Nuclear Safety Applications,* Applied to Software for DOE Federal staff in FY 2009. The CNS also sponsored the annual EM/NE/SC Software QA Support Group Annual Face-to-Face and Continuing Education Meeting September 1-3, 2009, in Washington, DC. The meeting included presentations to share site-specific software QA needs, lessons learned, and Headquarters initiatives and training related to instrumentation and control and software QA.

I. National Nuclear Security Administration, Defense Programs Activities

The NNSA Defense Programs Headquarters office (NA-10) provides direction and oversight of NNSA's defense programs activities, including nuclear safety and operations, transportation, research, engineering, and production, at NNSA's field offices. Significant accomplishments in FY 2009 include the following:

- Startup of the Highly Enriched Uranium Materials Facility: NNSA completed the startup process ahead of schedule for the Highly Enriched Uranium Materials Facility at the Y-12 site. Startup of this facility will allow for significant upgrades in both the safety and security of uranium storage. It will also expedite the elimination of aging nuclear facilities at the Y-12 site and reduction of the footprint for nuclear activities, improving both security and efficiency at the site.

- Integration of Safety into the Design Process: NNSA developed specific expectations for implementing DOE Standard 1189-2008, *Integration of Safety into the Design Process*, regarding design criteria for safety structures, systems, and components that are credited as features for preventing or mitigating chemical release accidents initiated by natural phenomena events. The expectations are intended for projects and major modifications involving nuclear facilities in the early design stages, specifically the Chemistry and Metallurgy Research building replacement at Los Alamos National Laboratory (LANL), the Pit Disassembly and Conversion Facility at SRS, the Radioactive Liquid Waste Treatment Facility upgrade at LANL, and the Uranium Processing Facility projects at the Y-12 site. In 2009, NNSA evaluated implementation during technical independent project reviews.

- Human Performance Improvement Initiative: In May 2009, NNSA created and chartered an enterprise Human Performance Improvement Working Group with the participation of Federal and contractor personnel from each NNSA site. The objective of the working group is to determine where and how human performance improvement initiatives can be fostered throughout the nuclear security enterprise. Since the first meeting, the membership roster has expanded to include representatives from multiple Departmental and contractor organizations.

- Contractor Assurance System Pilot Projects and Results: NNSA is increasing emphasis on contractor responsibility and accountability by implementing contractor assurance systems so that Federal oversight resources can be properly focused on areas of greatest concern. Pilot baseline assessments of the contractor assurance system process have been conducted at two NNSA sites, and all remaining sites should be assessed by mid 2010. The contractor processes reviewed to date indicate that the key elements are in place for an effective contractor assurance system within NNSA. Long-term measures of effectiveness for the contractor assurance systems are under development.

- Operational Readiness Reviews for Initial Startups and Restarts: NNSA successfully completed several restart activities during the past year. Highlights include graded operational readiness reviews for the restart of the Harden Engineering Test Facility (Building 334) at the Lawrence Livermore National Laboratory (LLNL), which was successfully completed in three days and was the subject of an article in the NNSA Technical Safety Bulletin. Other restarts include the Tritium Facility at LLNL, which prepares targets for the National Ignition Facility. The Y-12 National Security Complex also completed the startup of onsite transportation in support of the Highly Enriched Uranium Materials Facility, which is also expected to start in 2010.

- Fire Protection: NNSA convened the first DOE working group to discuss fire protection of active confinement ventilation systems. The workshop was attended by Departmental and Board staff and industry experts who deliberated on best practices and approaches for the fire

protection of nuclear confinement ventilation systems. The workshop resulted in a series of additional discussions, fire testing and research plans, and NNSA supplemental guidance. In addition, in 2009, LANL completed an updated baseline needs assessment for fire, hazardous material, and medical emergency response and completed an implementation plan to address the needs assessment recommendations. NNSA reported the status to the Board in letters dated March 10, 2009, and September 24, 2009.

- Implementation Verification Reviews: NNSA, in partnership with EM, SC, and HSS, is developing a guide for conducting implementation verification reviews of safety basis control sets. This guide will standardize processes and increase assurance that safety basis controls are effectively maintaining the safety posture at NNSA facilities.

- Defense Programs Headquarters Self-assessment: The inaugural biennial self-assessment of nuclear safety performance was completed by NA-10 in June 2009. This self-assessment identified that the organization had made significant improvements since the NNSA oversight review in 2007. NA-10 continues to pursue improvements, guided by a September 2009 corrective action plan that addresses issues identified during the self-assessment.

- Increased Focus on Safety in Performance Evaluation Process: For the first time, the NNSA Office of Safety participated in the NNSA corporate performance evaluation process, ensuring that each site addressed nuclear safety and environment, safety, and health performance objectives in their FY 2010 performance evaluation plans. Subject matter experts from the Office of Safety worked closely with site office counterparts and Headquarters program managers to develop a balanced set of site-specific, multi-site, and common performance objectives, measures, and targets.

- Improving Criticality Safety Processes: All NNSA sites with active fissile operations used performance indicators in 2009. These metrics provided indication of acceptable performance at most sites. However, LANL's performance-based incentives for criticality safety this past year were not met. Design changes to the Chemistry and Metallurgy Research replacement facility have been incorporated as a result of criticality safety reviews and subsequent input into the design process.

J. NNSA Chief of Defense Nuclear Safety

The Department established CTA positions as part of the Department's implementation plan in response to Board Recommendation 2004-1. The Principal Deputy Administrator is the CTA for NNSA.

For NNSA, CDNS provides technical support to the CTA in the area of nuclear safety. From 2005 to 2007, the CDNS completed its first series of biennial reviews of the implementation of nuclear safety requirements at NNSA sites that have nuclear safety responsibilities. These systematic reviews provide credible, objective, value-added information to NNSA line managers by evaluating site office and contractor performance in 18 functional areas. Specific reviews are tailored to the needs of each site by adding or deleting functional areas, based on past performance and input from Headquarters and field line management. In 2009, the CDNS completed the first series of follow-up reviews, which are tailored to re-evaluate areas where weaknesses were identified during the previous reviews. In all cases, follow-up reviews indicated overall continued good performance or improvements in performance since the first series of reviews was completed.

Additional activities and accomplishments of personnel assigned to CDNS in 2009 include:

- Issued guidance and expectations on design criteria for controls classified as safety significant to address chemical hazards in nuclear facilities. The guidance established a systematic approach that is consistent with design criteria for commensurate radiological controls.

- Developed and issued guidance and expectations for the use of combustible materials as process confinement barriers, establishing a standard that will enhance safety at NNSA facilities.

- Organized and executed a workshop on the interface between safety and security considerations when establishing safety controls and facility design. Developed a framework for a draft handbook to capture lessons learned and best practices regarding the safety/security interface.

- Obtained approval for and funding of the safety basis professional program, ensuring delivery of the training for safety basis personnel that is needed to ensure consistent application of nuclear safety requirements during safety basis development and approval. The final four safety basis professional program courses were completed, and eleven courses were delivered, providing mission-enabling training to over 250 students.

- Co-chaired the team responsible for revising the Departmental training order, developing the first comprehensive update to this directive since 1994. The CDNS also co-chaired the team responsible for upgrading the Departmental Readiness Review order, developing a comprehensive update to take advantage of lessons learned since the previous edition was published in 2003. This effort includes revising the Departmental standard for the planning and conduct of operational readiness reviews. The revised directives have entered the directives review and comment process, with an estimated publication and implementation in 2010.

- Reviewed five new and revised directives that affected nuclear safety in support of the CTA concurrence function for nuclear safety requirements. These reviews ensure that the new or revised directives meet NNSA safety expectations for NNSA nuclear facilities.

- Processed three exemptions to nuclear safety requirements, ensuring that associated compensatory measures provided adequate protection of workers, the public, and the environment.

- Provided nuclear safety expertise to ensure the proper integration of safety into design for several major NNSA projects and continued to develop a set of standardized criteria review and approach documents for use on technical independent project reviews. These standardized review criteria and approaches help ensure a systematic and thorough assessment of project readiness to proceed to the next project phase.

- Initiated efforts to develop a methodology for categorizing NNSA nuclear facilities that incorporates modern dose conversion factors. When complete, the methodology will permit a more accurate facility categorization with consequent improvement in the use of safety oversight resources.

- Provided input to NNSA and Departmental initiatives to reexamine self-governance models, ensuring that matters affecting nuclear safety were appropriately considered.

CDNS published quarterly technical bulletins that disseminated lessons learned, clarified CTA expectations, and provided official responses to nuclear safety questions from the site offices. Technical topics included the grading of readiness reviews, the results of a fire protection workshop, analysis of natural gas hazards, selection of safety significant controls, independent verification of safety basis controls, hazards of transuranic wastes, aging detection and mitigation programs for nuclear facilities, criticality safety, and the response to a Board recommendation regarding fire safety.

IV. Implementation of Board Recommendations

A. Overview of Board Recommendations

Board recommendations are the most formal mechanism the Board can use to prompt action by the Department. The Board issues recommendations to the Secretary on issues or circumstances it believes need to be resolved to ensure adequate protection of the public health and safety. The Secretary is required to respond to each Board recommendation within 45 days of publication of the recommendation in the Federal Register (or longer, if granted additional time). In addition, the Secretary must provide an implementation plan to the Board within 90 days of publication in the Federal Register of the Secretary's acceptance of the recommendation (or longer, upon appropriate notice). The Department's policy is to begin implementation plan development in parallel with the development of the Department's response if it is expected that the Secretary will accept the recommendation in whole or in part.

As of the end of FY 2009, the Board had issued 51 recommendations to the Secretary since the Board was established in 1988. The Secretary has accepted 47 of the Board's recommendations in their entirety, and accepted 4 with minor exceptions and clarifications. For each accepted recommendation, the Secretary has approved the Department's implementation plan. Forty-one of the Board's recommendations are now closed. The status of all Board recommendations is provided in Section IV.B.

The Board issued one new recommendation in FY 2009: Recommendation 2009-1, *Risk Assessment Methodologies at Defense Nuclear Facilities*. After the end of FY 2009, the Board issued one more recommendation in calendar year 2009, Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety*. Additional details are provided in Section IV.C.

One recommendation was closed in 2009: in March, Recommendation 92-4, *Multi-Function Waste Tank Facility at Hanford* was closed. This is described in Section IV.D.

The Department has completed actions outlined in its implementation plan and proposed closure of one additional recommendation, as described in Section IV.E.

The Department is working on implementing corrective actions identified in its active implementation plans, as described in Section IV.F.

The Department is required to report on implementation plans that take more than one year to complete; these are described in Section IV.G.

B. Historical Perspectives on Board Recommendations

Table 1 summarizes the status of all 52 Board recommendations. This table shows the status of all open and closed recommendations, including planned dates for completing implementation plan provisions for open recommendations.

An analysis of the Board recommendations and trends indicates that, initially, Board recommendations addressed specific, highly technical, significant safety issues within the Department's activities. Over time, the Department has addressed these risks and established integrated programs to improve the Department's overall safety management process. The Department's success in these areas, combined with the Board's increased use of letters and other notification methods, has led to the issuance of fewer, but often broader, recommendations in recent years.

Table 1. Summary Status of Board Recommendations

Rec	Subject	Open	Closed	Timeframe for Completion of DOE Implementation Plans
90-1	Savannah River Operator Training		10/27/1992	
90-2	Codes and Standards		10/24/1995	
90-3	Hanford Waste Tanks		05/01/1992	
90-4	Rocky Flats Operational Readiness Reviews		02/16/1995	
90-5	Rocky Flats Systematic Evaluation Program		10/24/1995	
90-6	Rocky Flats Plutonium in the Ventilation Ducts		10/24/1995	
90-7	Hanford Waste Tanks		09/04/1996	
91-1	Safety Standards Program		10/27/1992	
91-2	Reactor Operations Management Plan		10/27/1992	
91-3	Waste Isolation Pilot Plant		10/27/1992	
91-4	Rocky Flats Building 559 Operational Readiness Review		05/01/1992	
91-5	Savannah River K Reactor Power Limits		04/07/1993	
91-6	Radiation Protection		11/08/1996	
92-1	Operational Readiness of the HB-Line at Savannah River		10/27/1992	
92-2	Facility Representatives		09/17/1996	
92-3	HB-Line Operational Readiness Reviews		02/03/1993	
92-4	Multi-Function Waste Tank Facility at Hanford		03/24/2009	

Table 1, continued

Rec	Subject	Open	Closed	Timeframe for Completion of DOE Implementation Plans
92-5	Discipline of Operations During Changes		10/24/1995	
92-6	Operational Readiness Reviews		10/24/1995	
92-7	Training and Qualification		11/05/1993	
93-1	Standards Utilization in Defense Nuclear Facilities		03/25/1999	
93-2	The Need for Critical Experiments Capability		12/31/1997	
93-3	Improving Technical Capability in Defense Nuclear Programs		11/09/1999	
93-4	Environmental Restoration Management Contracts		06/28/1996	
93-5	Hanford Waste Tanks Characterization Studies		11/15/1999	
93-6	Maintaining Access to Nuclear Weapons Expertise		04/27/1999	
94-1	Improved Schedule for Remediation		04/29/2008	
94-2	Safety Standards for Low-Level Waste		12/22/1999	
94-3	Rocky Flats Seismic and Systems Safety		05/27/1999	
94-4	Deficiencies in Criticality Safety at Oak Ridge, Y-12		03/12/1999	
94-5	Integration of Rules, Orders, and Other Requirements		06/10/1999	
95-1	Improved Safety of Cylinders Containing Depleted Uranium		12/16/1999	
95-2	Safety Management		11/21/2006	
96-1	In-Tank Precipitation System at Savannah River		03/29/2002	
97-1	Safe Storage of Uranium-233		04/29/2008	
97-2	Continuation of Criticality Safety		08/07/2003	
98-1	Resolution of Safety Issues Identified by DOE Internal Oversight		03/28/2008	
98-2	Safety Management at the Pantex Plant		12/16/2008	
99-1	Safe Storage of Pits		09/09/2005	
2000-1	Prioritization for Stabilizing Nuclear Materials	X		December 2015 (See Sect. IV.F.)
2000-2	Configuration Management, Vital Safety Systems		08/08/2007	

Table 1, continued

Rec	Subject	Open	Closed	Timeframe for Completion of DOE Implementation Plans
2001-1	High-Level Waste Management at the Savannah River Site	X		December 2015 (See Sect. IV.F.)
2002-1	Quality Assurance for Safety-Related Software	X		Closure proposal in 2010 (See Sect. IV.F.)
2002-2	Weapons Laboratory Support of the Defense Nuclear Complex		11/22/2005	
2002-3	Requirements for the Design, Implementation, and Maintenance of Administrative Controls	X		Secretary proposed closure in January 2007. Additional verification activities ongoing. (See Sect. IV.E.)
2004-1	Oversight of Complex, High-Hazard Nuclear Operations	X		2012 (See Sect. IV.F.)
2004-2	Active Confinement Systems	X		2010 (See Sect. IV.F.)
2005-1	Nuclear Material Packaging	X		2010 (See Sect. IV.F.)
2007-1	Safety-Related In Situ Nondestructive Assay of Radioactive Materials	X		2012 (See Sect. IV.F.)
2008-1	Safety Classification of Fire Protection Systems	X		2010 (See Sect. IV.F.)
2009-1	Risk Assessment Methodologies at Defense Nuclear Facilities	X		To be determined (See Sect. IV.C.)
2009-2	Los Alamos National Laboratory Plutonium Facility Seismic Safety	X		To be determined (See Sect. IV.C.)

C. New Recommendations

The Board issued one new recommendation in FY 2009: Recommendation 2009-1, *Risk Assessment Methodologies at Defense Nuclear Facilities*.

2009-1, Risk Assessment Methodologies at Defense Nuclear Facilities

The Board issued Recommendation 2009-1 on June 30, 2009, calling for the Department to establish policy, requirements, and guidance for the use of quantitative risk assessment methodologies to support the design and operation of defense nuclear facilities. The recommendation also called for the Department to identify and address ongoing uses of such assessment methodologies that were not consistent with the policy and requirements to be developed. The Department's understanding is that the Board believes that, without a risk assessment policy and associated requirements and guidance, the Department does not have an adequate basis for accepting and using the results from any quantitative risk assessments it performs for defense nuclear facilities. The Board stated that this is particularly important since the managers of DOE's field elements are allowed to accept the safety risks that high-hazard operations may pose toward workers and the public, based on what the Board perceives as widely varying levels of rigor in quantitative risk assessments.

In FY 2009, the Department established a working group, which includes EM, NNSA, SC, CNS, and CDNS representatives, to develop a plan to implement the recommendation and ensure its proper

implementation. After the close of FY 2009, the Secretary accepted the recommendation on November 3, 2009, and provided the Board with the Department's implementation plan. The Secretary assigned the Deputy Director of the HSS Office of Nuclear Safety, Quality Assurance and Environment as the Department's responsible manager for this recommendation.

As identified by the Board, the Department sometimes uses elements of risk assessment techniques as part of the development of safety bases for nuclear facilities and in support of decisions related to the upgrade of its facilities. However, as also observed by the Board, the Department's predominant approach to managing safety relies on hazard-based deterministic analyses that are required by the Department's nuclear safety directives and rules. The Department's nuclear safety rules, directives, and standards emphasize use of this hazard-based deterministic approach. Although the Department does not have the recommended policy or requirements specifically focused on the use of quantitative risk assessment for nuclear safety applications, the Department does have policy, requirements, and standards that permit the Department and its contractors to appropriately manage and control risk assessments used for defense nuclear facilities.

The Department acknowledges that there is a lack of common understanding among DOE staff and managers on the definition of "risk assessment," the use and limitations of various risk assessment methodologies in nuclear safety applications, and how QA controls are applied when quantitative risk assessments are used in nuclear safety applications. The underlying cause of the inconsistent application of risk assessment under the existing system results mainly from weaknesses in communication and training on the Department's expectations related to the use of risk assessment methodologies in nuclear safety analysis that are derived from its policy, requirements, and standards. In addition, as recognized by the Board, there have been significant developments with regard to the use of risk assessment and risk-informed decision making as applied to safety in nuclear and other high-hazard activities that may be useful in improving safety performance at defense nuclear facilities.

To address these issues, the Department's plan for implementation includes: (1) issuing an information notice DOE-wide to better communicate DOE's expectations with regard to the conduct and use of risk assessments in nuclear safety applications; (2) developing and providing additional training for managers and staff regarding the use of risk assessment to better inform risk management decisions; and (3) establishing a working group of risk assessment experts to assist in peer review or development of risk assessments, consistent with DOE requirements, at defense nuclear facilities. The implementation plan also commits the Department to review the Secretarial Energy Notice 35-91, *Nuclear Safety Policy*, issued in 1991, to determine necessary changes to accommodate new developments in the use of risk assessment in risk-informed decisions for defense nuclear facilities. In 2010, the Department expects to seek input from the Board to help further develop and clarify its implementation activities.

To identify new information available to support more effective use of risk assessment in nuclear safety applications, the Department is committed to a year-long study to evaluate external and internal practices and lessons learned from the use of risk assessment in high risk activities. After completing this study, the Department will determine what changes in its existing directives or standards are necessary, or whether new directives or standards are appropriate to better utilize risk assessment tools in its nuclear safety applications. The Department will provide interim advice to field organizations on the quantitative risk assessments, complete the update to the nuclear safety policy, and provide the Board with plans for the appropriate directive or standard changes by the end

of 2010. This recommendation is expected to take more than one year because of the complexity of the technical issues involved and the need to carefully evaluate changes to the Department's existing system and framework of nuclear safety requirements to ensure protection of the public, workers, and the environment in a cost-effective manner.

2009-2, Los Alamos National Laboratory Plutonium Facility Seismic Safety

After the close of FY 2009, the Board issued Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety*, calling for the Department to implement near-term actions and compensatory measures to reduce the consequences of potential seismic events at LANL's Plutonium Facility, and to develop and implement a strategy to reduce future seismic risk at this facility. The Department is evaluating this recommendation.

NNSA has already taken a number of actions to respond to concerns raised by the Board. LANL has submitted updates to the facility's safety analyses that include revised seismic accident scenarios to more accurately, but conservatively, evaluate the consequences of such scenarios. This update, to be reviewed and approved by NNSA, resulted in significantly reducing the hypothetical consequences of a post-seismic fire to the maximally exposed offsite individual, compared to the previous analysis of the mitigated consequences. This proposed reduction results from establishing stricter limits on the overall material at risk allowed in the facility and defining specific material quantity limits for various forms of material. NNSA has also initiated actions to improve the seismic response of facility systems, improve the packaging of nuclear materials, and continue to reduce the amount of material that would be at risk in a seismic event.

D. Closures in 2009

The Board agreed with the closure of Recommendation 92-4, *Multi-Function Waste Tank Facility at Hanford*, in their 19th Annual Report to Congress on March 24, 2009. This recommendation addressed safety issues at the Tank Waste Remediation System Multi-Function Waste Tank Facility project at the Hanford Site.

The recommendation identified three areas of concern: project management structure, design bases (systems engineering) for the Multi-Function Waste Tank Facility, and technical and managerial competence. In developing an implementation plan to address these issues, the Department expanded the scope of its response to apply an integrated systems approach to define, plan, control, and execute the overall Hanford mission. While implementing this approach, the Department re-evaluated the need for the Multi-Function Waste Tank Facility project, canceled the project, and altered other Tank Waste Remediation System projects.

The Department completed 38 plan milestones of the original implementation plan, including all program management and site systems engineering commitments, as well as all milestones in revision one of the implementation plan. The final implementation plan deliverable was completed and provided to the Board in July 1998. The Secretary proposed closure of Recommendation 92-4 in a December 16, 1998, letter to the Board.

E. Recommendations Proposed for Closure

The Department did not propose closure of any Board recommendations in 2009. The Department proposed closure of one recommendation prior to 2009 that remains open.

2002-3, Requirements for the Design, Implementation, and Maintenance of Administrative Controls

On December 11, 2002, the Board issued Recommendation 2002-3. The Department issued its implementation plan on June 26, 2003, establishing a methodology and a course of actions that included:

- Reviewing existing requirements and guidance to determine whether supplemental guidance is needed to address safety-related administrative controls (now called specific administrative controls)
- Issuing supplemental guidance on specific administrative controls and providing training
- Evaluating safety basis documents to determine whether existing administrative controls meet Department expectations and identifying actions to upgrade controls when necessary
- Evaluating field implementation of specific administrative controls
- Strengthening Departmental processes to ensure that specific administrative controls are properly designed, implemented, and maintained.

The Department has completed all actions and commitments in the implementation plan for Board Recommendation 2002-3, including:

- Developing a Nuclear Safety Management Technical position
- Developing training materials for contractors and Federal employees
- Conducting reviews of facility safety bases to ensure that specific administrative controls are properly implemented
- Revising DOE Standard 3009-94, *Preparation Guide for U.S. DOE Nonreactor Nuclear Facility Safety Analysis Reports*, to address specific administrative controls.

The Department proposed closure of this recommendation in a January 2007 letter based upon completion of all deliverables. However, a follow-up review by the Board found that some defense nuclear facilities had not yet fully implemented the recommendation, indicating that DOE audits and self-assessments, as specified in the Department's implementation plan to assess the overall effectiveness of the program, were not effective. DOE agreed with the Board's conclusions, and the Department has taken action to improve the assessment processes for ensuring appropriate implementation of specific administrative controls. The Department will re-evaluate the Department's implementation of specific administrative controls using the improvement assessment processes.

During 2009, Departmental elements (primarily, NNSA, EM, and the HSS Office of Independent Oversight) took several actions toward re-evaluating the Department's implementation of specific administrative controls using the improvement assessment processes. NNSA and EM issued memos to their respective sites and began conducting follow-up reviews to verify compliance of their

implementation. HSS conducted an evaluation of its two-year initiative of evaluating site-specific implementation of controls. The final results from those efforts are expected to be discussed with the Board in early calendar year 2010.

F. Other Open Recommendations

In addition to the Implementation Plan for Recommendation 2009-1, the Department currently is actively working on completing implementation plan actions for the Board recommendations itemized below.

Recommendation 2008-1, Safety Classification of Fire Protection Systems

The Board issued Recommendation 2008-1, *Safety Classification of Fire Protection Systems*, in January 2008. It identifies the need for standards applicable to the design and operation of fire protection systems being relied upon as a primary means of protecting the public and workers from radiological hazards at DOE defense nuclear facilities.

The basis for this Board recommendation was that DOE's fire protection guidance documents did not include specific design and operational criteria for fire protection systems designated as safety-class or safety-significant. DOE Order 420.1B, *Facility Safety*, and DOE Guide 420.1-1, *Nonreactor Nuclear Safety Design Criteria and Explosives Safety Criteria Guide for Use with DOE O 420.1, Facility Safety*, describe general requirements for safety-class and safety-significant systems, (e.g., redundancy and QA), but they do not provide specific guidance on how a fire protection system, such as an automatic sprinkler system, should be designed, operated, and maintained. While acknowledging that this lack of specificity and guidance does not pose an immediate safety issue, the Board noted that DOE fire protection documents do not provide sufficient design and operational criteria for fire protection systems designated as safety-class or safety-significant and that this lack of guidance makes the design of new facilities and the assessment of proposed enhancements to fire protection systems in existing facilities more difficult and time consuming.

The Secretary accepted Recommendation 2008-1 on March 19, 2008, and the Department provided its implementation plan on July 23, 2008. A working group that includes EM, SC, and NNSA Headquarters program offices; the CNS; the CDNS; and representatives from multiple sites and field offices has been established and is working on the first several actions in the implementation plan. The Secretary assigned the Director, HSS Office of Nuclear Safety, Quality Assurance and Environment, as the Department's responsible manager for this recommendation. The Department's implementation plan was developed consistent with ISM principles and included the following elements:

- Preparing a listing and description of fire protection systems utilized in safety-class and safety-significant applications for both existing and planned facilities
- Identifying industry codes and standards, such as those of the Nuclear Regulatory Commission and Factory Mutual Global, applicable to fire protection sprinkler systems in high hazard or high value applications
- Developing specific design and operational criteria and issuing interim guidance for sprinkler systems used in safety-class and safety-significant applications

- Developing specific design and operational criteria for other selected types of fire protection systems based upon the potential for these systems to be used in safety-class and safety-significant applications in the future

- Revising DOE Standard 1066, *Fire Protection Design Criteria,* and other affected DOE directives to incorporate the additional design and operational criteria for safety-class and safety-significant fire protection systems.

In February 2009, the Department identified the safety systems, in addition to sprinkler systems, for which specific design and operating criteria are being developed under this implementation plan. In March 2009, the Department briefed the Board on current progress under this implementation plan.

Implementation of the 2008-1 plan requires more than a year to complete due to the technical complexity and widespread actions necessary to fully meet all commitments outlined in the plan. The Department estimates completion of all actions and milestones for the 2008-1 implementation plan in 2010.

Recommendation 2007-1, Safety-related In Situ Nondestructive Assay of Radioactive Materials

The Board issued Recommendation 2007-1 on April 25, 2007. The Secretary accepted Recommendation 2007-1 on June 28, 2007, noting that continuous improvement using *in situ* nondestructive assay (NDA) is warranted to support nuclear safety in various activities carried out at the Department's nuclear facilities. The Secretary approved the associated implementation plan on October 24, 2007.

The Secretary assigned the CNS as the Department's responsible manager for this recommendation. The Department's implementation plan was developed consistent with ISM system principles and included the following elements:

- Evaluating the condition of *in situ* NDA programs against evaluation criteria, which will be developed

- Identifying good practices, both commercial and within the Department, in training and qualification, design requirements for new facilities and equipment, standards for conducting *in situ* NDA, implementation of standards, and oversight

- Identifying relevant ongoing research and development activities

- Identifying needed levels and current shortfalls in personnel capabilities and training, equipment capabilities, policy and directives, QA, and oversight

- Establishing requirements, programs, and guidance, as needed

- Developing a prioritized plan for implementing the above criteria and requirements and verifying their effectiveness.

The implementation plan supports line oversight and minimizes the need for development of additional guidance. Site reviews will be integrated into existing oversight schedules using criteria review and approach documents tailored as appropriate for specific sites. The implementation plan framework uses existing industry standards to the extent possible to develop specific contract language and potential modifications to DOE Order 420.1B.

During FY 2009, the Department completed the following implementation plan actions:

- In December 2008, the Department completed Commitment 5.2.1 to establish criteria for conducting state-of-the-practice reviews of: a) training and qualification; b) design requirements for new facilities and equipment; c) standards for conducting NDA holdup measurements; d) implementation of standards; e) research and development; f) QA; and g) oversight.

- In December 2008, the Department also completed Commitments 5.2.2 and 5.2.3 to establish schedules for conducting state-of-the-practice reviews for previously identified EM and NNSA facilities.

- In December 2008, the Department also completed Commitment 5.5.2 to identify methods for capturing and clearly communicating NDA holdup measurement lessons learned, new technology, innovative techniques, and areas in which research and development is needed.

- In September 2009, the Department completed reviews required by Commitments 5.2.4 and 5.2.5 to conduct EM and NNSA state-of-the-practice reviews with the assistance of the NDA Technical Support Group. The CNS briefed the Board on the results of the reviews on October 29, 2009. Reports from these reviews were ultimately documented and provided to the Board on November 18, 2009. This report identified good practices with respect to training and qualification, design requirements for new facilities and equipment, standards for conducting *in situ* NDA holdup measurements, implementation standards, research and development, and oversight.

Implementation of the 2007-1 plan requires more than a year to complete due to the technical complexity and widespread actions necessary to fully meet all commitments outlined in the plan. The Department estimates completion of all actions and milestones for the 2007-1 implementation plan in 2012.

Recommendation 2005-1, Nuclear Material Packaging

The Board issued Recommendation 2005-1 on March 10, 2005, recommending development of requirements for nuclear material packaging. The Secretary accepted the recommendation on May 6, 2005, and approved the associated implementation plan on August 17, 2005.

The Department's implementation plan included several interim milestones and formal deliverables, including issuance of a new packaging and storage requirements document for nuclear materials, DOE Manual 441.1-1, *Nuclear Material Packaging Manual,* which was issued in March 2008. The Department completed the final implementation plan deliverable in September 2009: an integrated schedule for repackaging materials to meet DOE Manual 441.1-1. This plan included various site implementation plans, which project completion of repackaging to continue through 2014, with

emphasis on higher risk materials earlier in the schedules. The Department expects to propose closure of this recommendation in 2010.

Implementation of the manual is being accomplished with the assistance of an HSS-led Nuclear Material Packaging Storage Working Group. Two workshops were held in 2009, focusing on implementation of DOE Manual 441.1-1. The first prototype container, the Next Generation Special Nuclear Material Container, is undergoing design and test evaluation under management of the Los Alamos Site Office's Package Certification Group. DOE sites are developing detailed implementation plans for repackaging campaigns, with the goal of repackaging into containers meeting the guidance in DOE Manual 441.1-1 within the next four years. The HSS Office of Nuclear Safety Policy and Assistance will continue working with the Working Group on manual implementation and on developing consistent design, fabrication, test and surveillance methods, and documentation. A meeting is being planned in 2010 where the fully tested and documented LANL container design will be shared with other laboratories in order to share design and approval documentation, as well as lessons learned.

Completion of this recommendation has required more than one year due to the complexity of existing storage configurations, the time required to develop new storage container designs, and the time needed to develop resource-loaded site implementation plans and consolidate them into a Department-wide plan. The Department has completed its 2005-1 plan and expects to propose closure of this recommendation in 2010.

Recommendation 2004-2, Active Confinement Systems

The Board issued Recommendation 2004-2 on December 7, 2004. The recommendation addressed the benefit for the Department from changing its safety policy to require active confinement ventilation systems for all new and existing hazard category 2 and 3 defense nuclear facilities with the potential for a radiological release. The Board recommended that the Department enhance and update associated Departmental directives and standards and evaluate all new and existing facilities in light of the new requirements.

On March 18, 2005, the Secretary accepted the recommendation. The Department developed an implementation plan and provided it to the Board on August 22, 2005. On July 12, 2006, the Department issued a revised implementation plan that addresses the Board's recommendation by committing to review all hazard category 2 and 3 defense nuclear facilities to ensure that the selected confinement strategy is properly justified and documented. In accordance with the plan, priority will be given to design and construction projects, including ongoing major modifications of existing facilities.

DOE provided an update on the status of implementing Recommendation 2004-2 in a July 28, 2009, letter from Secretary Chu to the Board. As indicated in this letter, DOE has completed all the actions (for example, ventilation review and guidance development and establishment of an Independent Review Panel) necessary for performing facility-specific confinement ventilation system evaluations, and all but a few of the approximately 50 facility-specific evaluations have been completed. Nearly all of these evaluations confirmed that confinement ventilation systems were appropriately designed in accordance with the functionality identified in the documented safety analysis requirements.

However, some facility evaluations identified significant gaps against the evaluation criteria because, in most cases, those facilities were not designed to utilize active confinement ventilation as a safety

control. Rather, other controls were utilized to ensure public and worker safety in accordance with DOE safety requirements for nuclear safety basis development and facility design. DOE program secretarial offices are reviewing these evaluations to determine whether any changes are warranted based upon an evaluation of the cost and safety benefit.

In regard to the commitment in the implementation plan to revise a DOE directive to ensure that active confinement is the preferred design approach for hazard category 1,2, and 3 nuclear facilities, the Department has concluded that it needs to revise DOE Guide 420.1-1, *Nonreactor Nuclear Safety Design Criteria and Explosive Safety Criteria Guide for Use With DOE Order 420.1, Facility Safety,* and has begun this revision.

Implementation of the 2004-2 plan has required more than one year to complete due to the magnitude and scope of the actions, including site assessments and revision of Department standards and directives. The Department currently projects completion of the 2004-2 implementation plan commitments in June 2010.

Recommendation 2004-1, Oversight of Complex, High-Hazard Nuclear Operations

The Board issued Recommendation 2004-1 on May 21, 2004, noting concerns regarding a number of safety issues related to central technical authority, delegations of safety responsibilities, technical capability, nuclear safety research, lessons learned from significant external events, and ISM. The Secretary accepted the recommendation on July 21, 2004; approved the associated implementation plan on December 23, 2004; and approved revision 2 to this implementation plan on October 12, 2006.

In response to the Board's recommendation, the Department's implementation plan identified three broad areas for improvement: (1) strengthening Federal safety assurance, (2) learning from internal and external operating experience, and (3) revitalizing ISM implementation.

In FY 2009, the Department provided a report from NNSA to the Board covering operating experience implementation throughout the complex. This closed a commitment that also entailed oversight and self-assessment of the newly implemented operating experience systems. The Department also continued efforts to implement the CTA concept and promote ISM, QA, and the Federal technical capability program, as described in Section III.

This plan has required more than one year to complete because of the magnitude and complexity of the issues being addressed. Complex and lasting change in large organizations requires multiple years to implement and verify. The Department cannot accurately project the expected time to complete this implementation plan, in light of ongoing reforms and reviews; however, completion is not expected before 2012.

In FY 2009, the Board announced its plans to have a series of public meetings on this recommendation. The Board convened the first of these meetings in November 2009 to discuss the status of the Department's implementation plan and hear from the Department's senior leadership on their thoughts and plans regarding these issues.

Recommendation 2002-1, Quality Assurance for Safety-Related Software

The Board issued Recommendation 2002-1 on September 23, 2002, addressing the Board's concerns regarding the quality of the software used to analyze and guide safety-related decisions, the quality of the software used to design or develop safety-related controls, and the proficiency of personnel using the software. In addition, the Board noted that software performing safety-related functions requires appropriate QA controls to provide adequate protection of the public, workers, and the environment.

The Secretary accepted this recommendation in November 2002 and approved the 2002-1 implementation plan in March 2003. The overall execution of the Department's plan has been the responsibility of HSS and its predecessors. However, responsibility for implementing software QA rests with the line programs, EM, SC, and NNSA, and they provided many of the deliverables called for in the Department's plan. Beginning in June 2003, the Department has provided periodic briefings to the Board and its staff. EM reported all of its commitments as completed on September 28, 2005, and NNSA reported all of its commitments as completed on November 3, 2006.

The Department briefed the Board on October 15, 2009, and informed the Board that the issues identified in Recommendation 2002-1 have all been addressed, and the basis to support closure exists. In the briefing, the Department noted that its implementation plan has significantly improved safety software QA, the objectives identified in the plan have been achieved, and the safety software QA processes are functioning and are driving continuous improvement. The Department indicated that a letter would be provided proposing closure of this recommendation in FY 2010. In the future, the Department plans to brief the Board on the safety software QA activities as requested, and as part of annual briefings on the QA program implementation.

The implementation of the 2002-1 plan required more than a year to complete due to the technical complexity and widespread actions necessary to fully meet all commitments outlined in the plan. The Department anticipates closure of the recommendation in FY 2010.

Recommendation 2001-1, High-Level Waste Management at the Savannah River Site

The Board issued Recommendation 2001-1 on March 23, 2001, addressing the margin of safety and the amount of tank space in the SRS high-level waste system to enable timely stabilization of nuclear materials. The Secretary accepted the recommendation and provided an initial implementation plan on May 18, 2001. The Board amplified its expectations for this recommendation in a May 24, 2001, letter to the Secretary. The Secretary approved and issued revision 1 to the 2001-1 implementation plan on September 14, 2001. The implementation plan was subsequently revised to reflect significant salt disposition program changes and schedule delays driven by litigation relative to the Department's process for classifying waste for disposal.

In 2009, significant progress continued on activities begun in 2008, as outlined in the July 2006 implementation plan (Revision 4). The Department completed Commitment 2.9, "Demonstrate the viability of Deliquification, Dissolution, and Adjustment" by disposing of 100,000 gallons of salt solution in Saltstone in February 2008. In 2009, 500,000 gallons of salt solution material were transferred to Tank 50 for interim storage, awaiting processing at Saltstone. The Department also completed Commitments 2.10, "Demonstrate the viability of the Actinide Removal Process," which entailed

completing the first batch of waste through the process, and Commitment 2.13, "Begin Modular Caustic Side Solvent Extraction Unit radioactive operations," in May 2008. These two interim salt disposition processes subsequently decontaminated 143,000 gallons of salt waste in 2008, and have processed 600,000 gallons of salt waste in 2009.

The Board sent a letter to EM on March 31, 2009, noting concerns with three commitments in the implementation plan (Revision 4, July 11, 2006) that are not attainable. In 2009, these commitments were re-evaluated, and Revision 5 of the implementation plan was approved by the Secretary and transmitted to the Board on September 22, 2009. Revision 5 deletes the commitment to start up a Defense Waste Processing Facility evaporator and provides new dates for two other commitments:

- Commitment 3.9a, Return of Tank 48 to waste service: Revision 5 commits to December 2014, contingent upon establishment of a project baseline.

- Commitment 2.14, Startup of radioactive operations at the Salt Waste Processing Facility: Revision 5 commits to October 2015.

Revision 5 also adds two new commitments. The first (3.9b) is to establish the project baseline for Tank 48 recovery at CD 2, forecast for November 2010. The second new commitment (3.12), "Reduce Defense Waste Processing Facility Recycle by 1.25 million gallons per year," stems from the recently awarded contract for management of the SRS liquid waste system. The new contractor has proposed to implement facility modifications that are projected to collectively reduce the volume of facility recycle to the tank farms by 1.25 million gallons per year. The Department has incorporated this proposed recycle reduction as a contract performance requirement and as a new implementation plan commitment, with a commitment date of December 2011.

Completion of this plan has taken more than one year due to the associated work scope to fully complete the planned activities. The Department now estimates completion of all actions and milestones for the 2001-1 implementation plan in October 2015.

Recommendation 2000-1, Prioritization for Stabilizing Nuclear Materials

The Board issued Recommendation 2000-1 on January 14, 2000, calling for an accelerated schedule for stabilizing and repackaging high-risk, unstable special nuclear materials, spent fuel, unstable solid plutonium residues, and highly radioactive liquids that pose potential safety concerns for the public, workers, and the environment. This recommendation was a multiple-site recommendation that applied to both NNSA and EM sites. All NNSA commitments are complete with the exception of various stabilization activities at LANL, which are currently projected for completion by 2013. All EM commitments are complete except the stabilization of K-Basin sludge materials, which is discussed in more detail below.

In November 2005, the Secretary approved a revision to Section 5.1 of the Department's implementation plan. Commitment 120W in that revision committed the Department to complete bulk sludge containerization of K-West Basin sludge by November 2009. This commitment was predicated on an understanding of a specific treatment and packaging technology that was envisioned to be implemented to achieve a treatment and packaging date of November 2009.

By 2007, the project had achieved a CD 2/3A project status; however, the Department conducted a technology readiness assessment that addressed critical treatment and packaging technologies and determined that the technologies posed some risk. As a consequence, the Federal Project Director reestablished the baseline at a conceptual design level. In July 2007, the Chief Operating Officer for EM notified the Board that the Department had completed an Implementation Plan milestone for bulk sludge containerization. Subsequent to that effort, an alternatives analysis and additional discussions with EM Headquarters and the State of Washington indicated that there would be merit in relocating the Engineered Container and Settler Tube sludge from near the river to the plateau for subsequent treatment and packaging. That path forward was reviewed via an external technical review, which endorsed that approach.

As of November 2009, a primary area of site focus has been on technical approaches for retrieving the Engineered Container and Settler Tube wastes for interim packaging and relocation to a facility on the plateau for interim storage. In December 2009, EM informed the Board that the Engineered Container and Settler Tube sludge is scheduled to be removed from K-West Basin and stored in T-Plant by December 31, 2015.

Due to the technical complexity and characterization of the material requiring stabilization, and the technical complexity and magnitude of stabilization activities, more than one year has been needed to complete this implementation plan.

G. Report on Implementation Plans Requiring More Than One Year

The Department has taken more than one year to complete most of the implementation plans for Board recommendations. The more-than-one-year timeframes are necessary for a variety of reasons, including the size and scope of issues being addressed and the challenges in accomplishing complex-wide changes. The Department routinely provides the required Congressional notification, which is also required by the Board's enabling legislation, Chapter 21, Section 315(f)(1) of the Atomic Energy Act of 1954 [42 U.S.C. § 2286d(f)(1)] in conjunction with the Department's Annual Report to Congress on Board activities (i.e., this report). The following Department implementation plans for open recommendations have already required, or are expected to require, more than one year for completion:

- 2000-1, *Prioritization for Stabilizing Nuclear Materials*
- 2001-1, *High-Level Waste Management at the Savannah River Site*
- 2002-1, *Quality Assurance for Safety-Related Software*
- 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*
- 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*
- 2004-2, *Active Confinement Systems*
- 2005-1, *Nuclear Material Packaging*
- 2007-1, *Safety-Related In Situ Nondestructive Assay of Radioactive Materials*

- 2008-1, *Safety Classification of Fire Protection Systems*
- 2009-1, *Risk Assessment Methodologies at Defense Nuclear Facilities.*

A more complete status for each of these implementation plans, along with the reasons why more than one year has been or will be required, is provided in Sections IV.C (for 2009-1), E (for 2002-3), and F.

V. Other Board Interface Activities

Within HSS, the Office of the Departmental Representative to the Board manages the Department's overall interface with the Board and provides advice for resolving safety issues identified by the Board. DOE Manual 140.1-1B, *Interface with the Defense Nuclear Facilities Safety Board*, details the Department's process used to interface with the Board and its staff. In addition to the activities relating to the Board outlined in the prior sections of this report, the Department interacts with the Board and its staff on several other activities to further ensure adequate protection of public and worker health and safety and the environment at the Department's defense nuclear facilities:

- Coordination of the Board's review of the Department's safety directives
- Briefings, site visits, and other Board interactions
- Responses to Board reporting requirements
- Attendance and presentations at the Board's public meetings
- Safety Issues Management System (SIMS)
- Maintenance of the information archive of Board-related documents
- Interface Manual.

A. Coordination of Board Review of Department Safety Directives

One of the Board's significant responsibilities is to review and evaluate the Department's safety directives and standards that apply to the design, construction, operation, and decommissioning of the Department's defense nuclear facilities. Whenever the Department develops revisions, additions, or cancellations to directives potentially "of interest" to the Board, the Department notifies the Board and provides an opportunity for review and comment on the directive actions prior to approval of the actions by Department management. The Departmental Representative's office coordinates this review process with the Board to ensure that the Board and its staff are notified of each directive action and given an opportunity for review and comment prior to issuance or re-issuance of the directives. The Departmental Representative's office is responsible for communicating Board comments on each directive action to the office responsible for the directive action (via the Department's RevCom system), for communicating the comment responses back to the Board, and for facilitating comment resolution where needed. This close coordination allows the Department to benefit from the Board's advice and insight on the Department's safety directives and standards.

B. Briefings, Site Visits, and Other Board Interactions

The Department, the Board, and its staff are in regular contact to identify and resolve safety issues at the Department's defense nuclear facilities. The Department regularly provides briefings to the Board in order to update the Board on the Department's progress toward resolving issues identified in Board recommendations, the Department's safety initiatives, and specific safety issues as requested by the Board. These briefings include frequent briefings by program office and site personnel on issues specific to particular sites. Senior managers from EM and NNSA brief the Board members monthly on

key safety issues, and HSS routinely provides briefings on its activities. For example, the HSS Office of Independent Oversight briefs the Board about emerging issues after inspections of defense nuclear facilities.

The Board and its staff regularly visit the Department's defense nuclear facilities to perform reviews of the Department's safety initiatives, safety facilities, and operations, and to attend briefings at the sites. A list of site visits made by the Board and its staff is available on the Departmental Representative's website (https://www.hss.doe.gov/deprep/). In addition, Department personnel conduct teleconferences and video conferences to exchange information and resolve safety issues.

C. Responses to Board Reporting Requirements

The Board communicates with the Department through a variety of channels, including formal recommendations and reporting requirements, letters requesting action and information, and letters providing suggestions and information (such as staff issue reports and trip reports). Communication channels also include requests for information to the Department from the Board and its staff, public meetings, briefings and discussions, and site visits. The Board's choice of communication vehicle suggests the level of the Board's concern, with the more formal channels used for clearly-defined safety issues that require prompt attention by Departmental managers. From January to September 2009, the Board issued nine sets of formal reporting requirements, pursuant to Chapter 21, Section 313(d) of the Atomic Energy Act of 1954 [42 U.S.C. 2286b(d)], as shown in Table 2. Table 3 lists active reporting requirements from prior years. Table 4 lists the statutory letter commitments completed from January to September 2009. These tables are placed at the end of Section V.

D. Board Public Meetings

The Board holds public meetings periodically to review significant safety issues in a public forum and provides advance public notice for these meetings pursuant to the provisions of the "Government in the Sunshine Act" [5 U.S.C. §552b]. The Board held no public meetings in FY 2009, but did announce its intention to hold a series of meetings related to implementation of Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*. After the end of FY 2009, the Board conducted the first in this series on November 24, 2009.

E. Safety Issues Management System

The Department established a Department-wide commitment management tool, SIMS, in August 1995. Using this tool, the Department has reduced the number of outstanding commitments related to Board recommendations from 694 in August 1995 to 53 at the end of FY 2009. The total number of overdue commitments related to Board recommendations has also declined significantly, from 245 in August 1995 to 5 at the end of FY 2009.

In addition to commitments and actions related to Board recommendations, SIMS is also used to manage commitments and actions related to other interactions between the Department and the Board, such as Board written requests for action or information and Department commitments in letters to the Board. At the end of FY 2009, the Department was tracking 26 open letter commitments to the Board. Five are overdue, at various stages of completion and closure.

The Departmental Representative conducts qualitative and technical reviews of the Department's implementation plans and other outgoing correspondence to the Board to identify and capture

Department commitments. Commitment information identified from these documents is entered into the SIMS database. Monthly summary reports on the status of commitments that are overdue and coming due in the near term are distributed to responsible Department managers, points of contact, and secretarial officers. Quarterly SIMS reports are also prepared to focus attention where needed. Department personnel can access detailed SIMS information and use various view, sort, and report formats via an on-line, Internet-based user interface.

F. Information Archive of Board-Related Documents

A key part of identifying, understanding, and resolving safety issues is maintaining effective communication between the Department and the Board. One of the key mechanisms to facilitate communication is regular correspondence between the Department and the Board. A large portion of the written communication involves the Board's recommendations and the associated deliverables, schedules, and reporting requirements contained in the Department's implementation plans. In addition, the Department receives trip reports detailing visits by the Board and its staff to Department facilities. The Department also receives specific requests from the Board and its staff for particular information or action by the Department.

The Departmental Representative maintains an information archive of all correspondence, reports, plans, assessments, and transmittals between the Department and the Board on line at https://www.hss.energy.gov/deprep/. The website provides an efficient way for the Department to share unclassified, non-sensitive information pertaining to defense nuclear facility activities. Consistent with DOE information security policies, information classified as Official Use Only or higher is not available on the website and is protected in accordance with applicable requirements based on its classification.

The following types of documents are included in the information archive:

- Board recommendations
- Department responses and implementation plans
- Department letters to the Board
- Board letters to the Department
- Selected key letters concerning the status of recommendations
- Policy statements from the Secretary and the Board
- Annual Reports to Congress from the Secretary and the Board concerning Board-related matters
- Resumes of the Board members
- Department Manual for Interface with the Board
- Board staff issue reports provided to the Department by the Board
- Board Quarterly Reports and Annual Reports to Congress.

G. Interface Manual

The governing instruction for Departmental interaction with the Board is DOE Manual 140.1-1B. Since June 2008, the Office of the Departmental Representative has been co-leading a DOE-wide team to revise the manual as part of the HSS project to revise and update safety directives. The team has converted the requirements and responsibilities of the manual into the format of an order and is in the process of making additional changes, including addressing comments received from the Department's internal "red team" in September 2009. Once the revisions are completed, the order will be processed in accordance with the Department's directive system to facilitate Department-wide review and ultimate approval of the revised directive. This order will sustain the requirements and responsibilities by which the Department:

- Interfaces with the Board and its staff
- Cooperates fully with the Board as the Board and the Department meet their requirements and fulfill their respective responsibilities under the Atomic Energy Act, as amended
- Thoroughly considers the recommendations and other safety information and advice provided by the Board.
- Consistently meets its commitments made in response to recommendations of the Board and ensures that actions taken in response to Board recommendations and other safety information and advice are tracked from planning though completion.

Table 2. Reporting Requirements Established by the Board in FY 2009 (January-September 2009)

Date	Reporting Requirements	Days to Report
1/13/2009	A report on the Plutonium Facility Ventilation System Upgrades at Los Alamos National Laboratory	90
1/13/2009	Supplement to the 2008 Department's Nuclear Criticality Safety Program annual report	Provide with the annual report
1/23/2009	Briefing on the nuclear criticality safety evaluation for the Highly Enriched Uranium Materials Facility at the Y-12 National Security Complex	90
2/6/2009	Briefing on the H-Canyon safety related electrical system at the Savannah River Site	90
3/23/2009	A report on the Idaho Cleanup Project work planning and Control deficiencies	90
4/7/2009	A report and briefing on the safety posture of non-safety-class heat source plutonium containers stored in the vault water baths, and the strategy for correcting vault water bath deficiencies at Los Alamos National Laboratory	45
4/7/2009	A briefing describing the plan of action to improve the process used to identify and resolve operability issues related to other vital safety systems at Los Alamos National Laboratory	60

Table 2, continued

Date	Reporting Requirements	Days to Report
4/21/2009	A report on actions to be taken to complete the deliverables and remediate deviations from the guidance developed in accordance with the 2004-2 Implementation Plan, *Active Confinement Systems*	60
7/28/2009	Briefing on the plans to modify and upgrade the fire protection systems in the Device Assembly Facility at the Nevada Test Site	October 2009

Table 3. Active Reporting Requirements Established by the Board in Prior Years

Date	Reporting Requirements	Days to Report
3/13/2007	An annual report on the annual assessment of the 9212 Complex, and the progress on the Uranium Processing Facility	Annually
9/9/2005	Briefing on the contents of the annual revision to the Pantex Nuclear Material Management Program Management Plan	Annually
8/7/2003 (Modified 1/28/2008)	Annual Report on the Department's Nuclear Criticality Safety Program	Annually

Table 4. Letter Commitments Completed in FY 2009 (January-September 2009)

Letter #	Commitment Title	Date Completed
SL03-031	Annual report on the Department's Nuclear Criticality Safety Program	2/23/2009
SL09-001	Supplement to the 2008 Department's Nuclear Criticality Safety Program annual report	2/23/2009
SL08-020	Report on the evaluation of the disposition of findings from Nuclear Explosive Safety Studies, NES Change Evaluations, and Operational Safety Reviews from 2003 through 2008	3/5/2009
SL08-019	Report on the immediate actions to be taken in response to the Los Alamos National Laboratory fire and emergency services 2008 Baseline Needs Assessments	3/10/2009
SL07-004	Annual report on the annual assessment of the 9212 Complex, and the progress on the Uranium Processing Facility	4/2/2009
SL09-004	Briefing on the H-Canyon Electrical System at the Savannah River Site	4/23/2009
SL09-003	Briefing on the nuclear criticality safety evaluation for the Highly Enriched Uranium Materials Facility at the Y-12 National Security Complex	4/28/2009
SL07-001	Summary Structural Engineering Report on the structural design of the Salt Waste Processing Facility at the Savannah River Site	4/30/2009
SL09-007	Report and briefing on the safety posture of non-safety-class heat source plutonium containers stored in the vault water baths, and the strategy for correcting vault water bath deficiencies at Los Alamos National Laboratory	5/19/2009

Table 4, continued

Letter #	Commitment Title	Date Completed
SL09-007	Briefing describing the plan of action to improve the process used to identify and resolve operability issues related to other vital safety systems at Los Alamos National Laboratory	5/19/2009
SL09-005	Report on the Idaho Cleanup Project work planning and control deficiencies	6/1/2009
SL09-002	Report on the Plutonium Facility Ventilation System Upgrades at Los Alamos National Laboratory	6/19/2009
SL09-008	Report on actions to be taken to complete the deliverables and remediate deviations from the guidance developed in accordance with the 2004-2 Implementation Plan, *Active Confinement Systems*	7/29/2009
SL08-019	Report on the plan, schedule, funding source, and progress for fully implementing the Los Alamos National Laboratory fire and emergency services 2008 Baseline Needs Assessments	9/24/2009

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Appendix A – Acronyms and Abbreviations

ASME	American Society of Mechanical Engineers
Board	Defense Nuclear Facilities Safety Board
CD	Critical Decision
CDNS	Chief of Defense Nuclear Safety
CNS	Chief of Nuclear Safety
CTA	Central Technical Authority
DART	Days Away, Restricted, or Transferred
Department	Department of Energy
Departmental Representative	Departmental Representative to the Defense Nuclear Facilities Safety Board
DOE	Department of Energy
EM	DOE Office of Environmental Management
FY	Fiscal Year
HEPA	High Efficiency Particulate Air
HSS	DOE Office of Health, Safety and Security
ISM	Integrated Safety Management
JCO	Justification for Continued Operations
LANL	Los Alamos National Laboratory
LLNL	Lawrence Livermore National Laboratory
NA-10	NNSA Defense Programs Headquarters Office
NDA	Nondestructive Assay
NE	DOE Office of Nuclear Energy
NNSA	National Nuclear Security Administration
NQA	Nuclear Quality Assurance Standard
ORP	DOE EM Office of River Protection
QA	Quality Assurance
SC	DOE Office of Science
Secretary	Secretary of Energy
SIMS	Safety Issues Management System
SRS	Savannah River Site
TRC	Total Recordable Case
U.S.C.	United States Code
WIPP	Waste Isolation Pilot Plant
WTP	Waste Treatment and Immobilization Plant Project

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