U.S. Department of

ENERGY

Department of Energy Activities Relating to the Defense Nuclear Facilities Safety Board Fiscal Year 2010

Report to Congress

July, 2011

United States Department of Energy
Washington, DC 20585

Message from the Secretary of Energy

July, 2011

As we in the Department of Energy continue to consolidate our operations, reduce our nuclear footprint and modernize our defense nuclear facilities, we do so with a keen interest in maintaining the safety of our workers, the public and the environment. In the wake of The Deep Water Horizon disaster, the recent Metro Subway crash, Crandall Canyon Mine collapse, Upper Big Branch Mine Explosion, and most recent the incident at Japan's Fukushima power facility, the Department recognizes it must work smarter and achieve a level of increased dexterity in achieving its mission. We must be both productive and safe. We can neither sacrifice mission reliability by shackling our productivity with unduly cumbersome and outdated policies, nor put our workers or the public at risk by exposing them to unsafe practices or conditions. An intelligent, approach to safety must be maintained. These recent catastrophes serve as a stark reminder that we must be diligent in planning for the unexpected and the rare occurrence. Even good performers realize complacency is the enemy of excellence. I remain steadfast in my support of the Department's safety program and fully believe nuclear safety remains essential to the success of the Department's mission.

Through our collaborative efforts within the Department, with other agencies and industry leaders, our programs will continue to improve and stay current with the latest safety concepts. To optimize this approach, the Department has fostered a proactive, collaborative, and transparent relationship with the Defense Nuclear Facilities Safety Board ("Board"). If we are to maintain a successful path forward we must all function as a team of effective scientists and engineers dedicated to dispositioning the Nation's legacy wastes, managing our nuclear stockpile, and protecting the Nation's security. In support of this crucial task, I look forward to further collaboration with the Defense Nuclear Facilities Safety Board in achieving our mission and welcome your review of the attached FY2010 Annual Report highlighting our achievements.

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**
  Chair, 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 Dianne Feinstein**
  Chair, Senate Subcommittee on Energy and Water Development
- **The Honorable Lamar Alexander**
  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 Jeff Sessions**
  Ranking Member, Senate Subcommittee on Strategic Forces
- **The Honorable John Boehner**
  Speaker of the House of Representatives
- **The Honorable Harold Rogers**
  Chair, House Committee on Appropriations
- **The Honorable Norman D. Dicks**
  Ranking Member, House Committee on Appropriations
- **The Honorable Rodney Frelinghuysen**
  Chair, House Subcommittee on Energy and Water Development
- **The Honorable Peter J. Visclosky**
  Ranking Member, House Subcommittee on Energy and Water Development
- **The Honorable Howard P. "Buck" McKeon**
  Chair, House Committee on Armed Services
- **The Honorable Adam Smith**

Ranking Member, House Committee on Armed Services

- **The Honorable Michael R. Turner**
  Chair, House Subcommittee on Strategic Forces
- **The Honorable Loretta Sanchez**
  Ranking Member, House Subcommittee on Strategic Forces
- **The Honorable Fred Upton**
  Chair, House Committee on Energy and Commerce
- **The Honorable Henry A. Waxman**
  Ranking Member, House Committee on Energy and Commerce

If you have any questions or need additional information, please contact me or Mr. Jeff Lane, Assistant Secretary for Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,

Steven Chu

AUG 2 5 2011

Executive Summary

The Department of Energy (DOE or the Department) welcomes the opportunity to provide this Annual Report to Congress in accordance with Section 316(b) of the Atomic Energy Act of 1954. This Annual Report describes the Department's activities during fiscal year (FY) 2010 that are related to the Defense Nuclear Facilities Safety Board (Board), including the Department's safety initiatives and activities, the status of Board recommendations, and interface activities between the Department and the Board.

To optimize its nuclear safety posture, DOE has fostered a proactive, collaborative, and transparent relationship with the Board. Such a relationship is critical to ensuring that the Department's nuclear safety programs are continuously improved; fully support the health and well being of the public, the environment, and DOE's workers; and advance the reliability of the DOE mission. The Department has a unique role as an owner, operator and overseer. The Board's expertise and advice can positively guide the Department's safety posture.

Department Safety Initiatives

The Office of Health, Safety and Security (HSS), the Office of Environmental Management (EM), the Chief of Nuclear Safety (CNS), the National Nuclear Security Administration (NNSA), and the Chief of Defense Nuclear Safety (CDNS) have made progress in over 20 separate safety initiatives, each of which contributes to the Department's complex-wide nuclear safety and risk reduction programs. Among these initiatives, three figured prominently in the Department's overall risk reduction efforts: design safety at the Waste Treatment and Immobilization Plant (WTP) at the Hanford Site; the DOE-wide safety and security reform initiative; and enhanced project and contract management for capital projects.

The WTP is the largest design, construction, and commissioning project in the Federal sector. When completed, it will be the largest waste processing plant in the world. Its key function is to immobilize, in glass, the 53 million gallons of waste from Hanford's 177 high-level radioactive waste underground storage tanks. As of October 2010, the WTP design was over 80 percent complete and construction was over 50 percent complete. The Board has voiced concerns in three areas regarding the WTP: its waste mixing ability; adequate control of hydrogen generated by radioactive waste; and limitations on the plant's operating envelope. DOE is working closely with the Board and other technical experts to address these concerns.

A paramount goal of the Safety and Security Reform initiative is to develop an improved set of directives that will protect DOE workers, the public, and the environment more consistently and effectively. This goal is being accomplished largely through clarification of essential requirements and the elimination of duplicative or outdated requirements. The effort is designed to strengthen and improve safety and security requirements that maintain the highest levels of protection and accident prevention at the Department's defense nuclear facilities. The Department anticipates that all directives reform activities will be completed in 2011.

The Department completed several contract management improvements to reduce risks, provide more rigorous oversight, and improve performance of capital asset projects within the Department. EM senior management focused on four areas of improvement for capital asset projects: people and resources; cost estimating; project management; and contract management.

In addition to the three safety initiatives figuring prominently in the Department's overall risk reduction efforts described above, the Department remains actively engaged in implementing the other safety initiatives described in detail in this report. Further, the Department proactively addressed two areas of prior concern to the Board: identifying and mitigating suspect/counterfeit items, and enhancing DOE's nuclear safety research and development (NSR&D) programs. HSS initiated efforts to implement more rigorous and reliable processes

for addressing the problem of suspect and counterfeit items. Similarly, the Department's NSR&D program is being reinvigorated to coordinate and prioritize research needs across the complex.

Board Recommendations

The Board agreed with DOE that Recommendation 2002-1, *Quality Assurance for Safety-Related Software*, should be closed, noting improvements to the Department's safety software quality assurance practices. The Board issued one new recommendation in FY 2010: Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety,* which discusses the need to execute both immediate and long-term actions that can reduce the risk posed by a seismic event at the Plutonium Facility at Los Alamos National Laboratory. The two latest recommendations, Recommendation 2010-1, *Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers,* and Recommendation 2010-2, *Pulse Jet Mixing at the Waste Treatment and Immobilization Plant,* were issued in early FY 2011.

DOE's progress towards addressing each of the 12 currently open recommendations is discussed in the full report. Extensive work continues on completing the commitments specified in the implementation plan for each open recommendation, including work to clean up hazardous materials, decontaminate and decommission aging facilities, and stabilize and consolidate nuclear materials to eliminate or further reduce risks.

REPORT TO CONGRESS

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Tables and Figures

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 Department of Energy (DOE or the Department) welcomes the opportunity to provide this Annual Report to Congress that describes the Department's activities in fiscal year (FY) 2010 that are related to the Defense Nuclear Facilities Safety Board (DNFSB or the Board).

The Board is an independent executive-branch agency established by Congress in 1988 to provide 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 standards relating to the design, construction, operation, and decommissioning (D&D) of the Department's defense nuclear facilities. Figure 1 shows the locations of DOE's major defense nuclear facilities.

Figure 1. Major Department of Energy Defense Nuclear Facilities

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), requests from the Board and its staff for information, public meetings, briefings, discussions, and site visits.

The remainder of this report is organized as follows:

- **Section III, *Department Safety Initiatives and Activities***, 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 or ongoing in FY 2010 to implement Board recommendations accepted by or under review by the Secretary of Energy.
- **Section V, *Interface Activities*,** describes Departmental activities to maintain communications and improve interaction between the Department and the Board.
- **Appendix A,** contains several tables illustrating the status of specific Board recommendations and reporting requirements.
- **Appendix B,** acronyms and abbreviations.

Site-specific activities and accomplishments for FY 2010 are provided in a supplement to this Annual Report to Congress that can be found on the Departmental Representative's (DR) webpage at: http://www.hss.energy.gov/deprep/archive/annlrpts/rpts2con.asp.

III. Department Safety Initiatives and Activities

This section describes initiatives and activities that the Department is implementing to improve performance in ensuring public health and safety on a DOE-wide 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 initiatives described in Section III.A – III.F are DOE-wide efforts led by the Office of Health, Safety and Security (HSS). Following these DOE-wide efforts, key line program accomplishments and initiatives are described.

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

Early and effective integration of safety in the design process has been one of the Board's major points of emphasis in recent years and the Department continues to focus on improvements in this area. HSS worked closely with the National Nuclear Security Administration (NNSA) and the DOE Offices of Management (MA), Nuclear Energy (NE), Science (SC), and Environmental Management (EM) to complete an upgrade of training modules for implementing DOE Standard 1189, *Integration of Safety into the Design Process*. HSS provided this training to several DOE sites, including Los Alamos, Savannah River, and Hanford. HSS also worked closely with these offices to clarify requirements and guidance contained in this standard. In addition, the Department shared lessons learned from successful safety strategy development and integration. The process strengthened relationships among contractors, customers, and regulators resulting in efficient work processes and cost savings due to the elimination of last minute surprise design changes. HSS, the Chief of Nuclear Safety (CNS), and the Savannah River Site co-led the *Integrating Safety into Design* track at DOE's annual Integrated Safety Management (ISM) conference, held in 2010 in Augusta, Georgia.

Safety and Security Directives Reform Accomplishments

As of May 1, 2011, over 91 percent of DOE's directives have been completed or are under review. Of these, over 58 percent have been completed and over 40 percent are under review. The following significant revisions to safety directives were accomplished:

- DOE Guide 424.1-1B, *Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements* (Issued April 2010)
- DOE Order 425.1D, *Verification of Readiness to Start Up or Restart Nuclear Facilities* (Issued April 2010)
- DOE Order 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities* (Issued April 2010)
- DOE Order 433.1B, *Maintenance Management Program for DOE Nuclear Facilities* (Issued April 2010)
- DOE Order 422.1, *Conduct of Operations Requirements for DOE Facilities* (Issued June 2010)
- DOE Guide 423.1-1A, *Implementation Guide for Use in Developing Technical Safety Requirements* (Issued November 2010)
- DOE Order 252.1A, *Technical Standards* (Issued February 2011)
- DOE Order 225.1B, *Accident Investigations* (Issued March 2011)
- DOE Order 210.2A, *DOE Corporate Operating Experience Program* (Issued April 2011)
- DOE Policy and Order 226.1B, *Implementation of DOE Oversight Policy* (Issued April 2011)
- DOE Order 414.1D, *Quality Assurance* (Issued April 2011)
- DOE Policy and Order 450.2, Integrated *Safety Management System* (Issued April 2011)

B. Review of Safety Requirements and Directives

On March 16, 2010, Deputy Secretary of Energy Daniel Poneman approved the Department's plan for safety and security reform, including end-state visions for safety and security. The goal of the directives reform initiative is to ensure there is a comprehensive set of requirements that protects workers, the public, and the environment more consistently and effectively. The requirements must be sufficient to direct the Department in performing its mission using the high standard of safety and security that its stakeholders expect. While requirements may be streamlined through consolidation or elimination of duplicative or outdated provisions, the reduction is intended solely to improve the clarity and usability, and hence the effectiveness, of requirements. This effort has been undertaken with the objective of not only strengthening and improving the system, but also of continuing to ensure the highest levels of protection and accident prevention at defense nuclear facilities. One important aspect of the reform effort is to increase usage of external consensus standards wherever such standards are available and, more importantly, are truly applicable.

The Department has worked closely with the Board during the safety and security reform effort. The Board held a public meeting on May 12, 2010 to examine the impact these initiatives might have on assuring adequate protection of the health and safety of the public and workers at DOE's defense nuclear facilities. Subsequent to the hearing, in June 2010, HSS issued a revised Project Management Plan. In June 2010, HSS finalized its Project Management Plan (PMP), Revision 2, to provide direction for implementing the Department's 2010 safety and security reform plan in a disciplined manner. The PMP established project controls based on stakeholder feedback including: establishment of Executive Steering Committees, a Requirements Framework for each topical area to ensure a systems approach is used in making requirements changes, multi-disciplinary expert and stakeholder reviews prior to submittal to DOE-wide reviews, and a checklist of review criteria that must be addressed for each directive. The project scope includes the following six topical areas: worker safety and health; nuclear safety, environment and quality assurance; operational awareness; independent oversight; safeguards and security; and classification.

For directives reform, changes are being made within the established Departmental Directives Program. For each identified directive action, formal Justification Memos are developed and approved by the Department's Directives Review Board. Once the scope and schedule of planned actions are approved, revised or consolidated directives are developed by teams of subject matter experts with input from the associated Executive Steering Committee. The proposed changes are then released for DOE-wide review. Review, comment resolution, concurrence, and approval also proceed in accordance with the Department's established directives process. The PMP process augments the established Departmental Directives Program with additional stakeholder reviews and inputs.

HSS expects that all HSS safety directives will be ready for DOE-wide review by May 2011, and anticipates completion of all directives reform activities in 2011.

C. Integrated Safety Management Activities

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

- Strengthening safety culture
- Improving work planning and control
- Ensuring that safety is integrated into early stages of mission planning and design work (Discussed previously in Section. III.A.)

- Developing new concepts to enhance feedback and improvement processes
- Ensuring that the technical capabilities of future staff meet the safety needs of the Department
- Streamlining the implementation of specialty safety training.

Highlights of ISM lessons learned and best practices across the complex culminated at the annual ISM workshop. Last year, over 1,000 line managers, safety champions, safety professionals, as well as other interested professionals from industry and academia, attended. Featured presentations included the Chairman of the Defense Nuclear Facilities Safety Board discussing the importance of metrics and leading indicators to safety program implementation.

Integrated Safety Management Accomplishments

- **Strengthening Safety Culture:** The Energy Facility Contractors Group (EFCOG)/DOE ISM Safety Culture Task Team focused on improving three safety culture areas: 1) Leadership, 2) Employee Engagement, and 3) Organizational Learning. The team issued a report in FY 2010 that developed the framework for safety culture management reviews. This report--along with other safety culture models, e.g., those of the Nuclear Regulatory Commission (NRC) and the Institute of Nuclear Power Operations--were used to develop the safety culture framework for the Waste Treatment and Immobilization Plant.
- **Work Planning and Control:** Following an extensive series of reviews by the Board of activity-level work planning and control at sites across the DOE complex, the Department joined forces with EFCOG to participate in a complex-wide work planning and control improvement initiative designed to improve activity work planning and control, contractor assurance, and federal oversight of work planning.
- **Early Integration of Safety into Project Design:** Discussed in Section III.A.
- **Enhancing Feedback and Improvement**: The Department advanced the implementation of the "ISM Champions" concept. ISM Champions are safety leaders from HSS and NNSA who are assigned to support line management in developing and sustaining vital, mature ISM systems throughout the Department so that work is reliably accomplished in a safe manner.
- **Technical Capabilities Analysis:** The Department updated its workforce analysis for NNSA, EM, SC, HSS, and Headquarters offices. The analysis and subsequent action plan addressed technical staffing needs and prioritized key positions in the Department. Technical staffing needs are discussed in more detail in Section III.H.
- **Training:** The Department held an ISM training workshop that included participants from EM, the Savannah River Site, prime contractors, other government agencies, academia, private industry and international organizations.

DOE as a Stakeholder in Industry Standards

DOE's current directives and standards frequently reference industry-wide standards. Consequently, it is advantageous from both a Quality Assurance (QA) and a directives reform perspective that the Department continue its ongoing role as an active participant in revisions to existing standards and development of new standards. Examples where DOE participated include:

- American Society of Mechanical Engineers (ASME) standard NQA-1, *Quality Assurance Requirements for Nuclear Facility Application*
- American Society of Civil Engineers (ASCE) standard ASCE-4, *Seismic Analysis of Safety Related Nuclear Structures*
- American Institute of Steel Construction (AISC) standard AISC N690, *Specification for Safety-Related Steel Structures for Nuclear Facilities*
- ASME standard AG-1, *Code on Nuclear Air and Gas Treatment*

D. Facility Representative and Safety System Oversight Programs

The Department's key safety personnel include Facility Representatives (FR) and Safety System Oversight (SSO) personnel. FRs are highly trained Department employees who provide effective day-to-day safety oversight of contractor operations at the Department's most hazardous facilities. The FRs provide direct interaction with the Board's site representatives and also provide key interface with the Board and its staff. DOE's SSO personnel are responsible for providing oversight of contractors' programs to ensure that critical safety systems will function properly if an accident occurs. Approximately 185 FRs and 60 SSOs around the complex provide oversight of operational activities and safety systems important to mission accomplishment and worker and public safety. DOE Standard 1063-2006, *Facility Representatives*, defines the duties, responsibilities, and qualifications for FRs. SSO duties and responsibilities are defined in DOE Order 426.1, *Federal Technical Capability*.

Monthly FR/SSO Steering Committee teleconferences chaired by the FR/SSO Program Manager provide venues for complex-wide collaboration and sharing best practices and lessons-learned. Staff from the DR's office participates in these meetings to share information with the community on the latest Board issues and upcoming Board and Board staff travel. This participation has improved transparency and communication among the Board, Board staff, and FR/SSO personnel.

E. Quality Assurance

The scope of the Department's activities to improve our overall quality assurance posture included both external participation with industry as well as central and site-specific QA activities. HSS initiated the following safety QA-related activities, several of which responded to Board concerns regarding contractor QA recommendations called out in DOE Guide 414.1-3, *Suspect/Counterfeit Items Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements,* and with DOE Order 414.1C*, Quality Assurance.* In May 2011, HSS and the DR's office will provide Department-wide visibility to and dialogue about this evolving safety and mission reliability vulnerability by featuring Suspect and Counterfeit Items as the next topic in HSS's ongoing Visiting Speakers Program.

As discussed in Section IV.E, Board Recommendation 2002-1, *Quality Assurance for Safety Related Software*, was closed in FY 2010. The Department is continuing to implement software QA improvements, including the addition of new approved software tools, facilitating cross-department sharing of ideas to address software issues, and ensuring that proper QA is proactively incorporated into the software development process.

- The Department completed its Implementation Plan to address the increased rejection rates of high efficiency particulate air (HEPA) filters at the HEPA filter test facility. HSS submitted a report to the Board detailing the results of actions taken by DOE and the major filter manufacturer to reduce manufacturing defects. HSS staff presented major observations from the report at a nuclear air cleaning conference.

F. Other DOE-wide Safety Initiatives

In addition to the key initiatives discussed above, DOE is continuing to address several other issues and vulnerabilities that remain of interest to the Board.

Nuclear Safety Research and Development

In Recommendation 2004-1, Oversight of Complex, High-Hazard Nuclear Operations, the Board identified the need for the Department to coordinate NSR&D activities throughout the Department. Consequently, the DR and the Department senior management are collaborating to reinvigorate NSR&D and prioritize research needs across the complex. For example, starting in FY2011, the NSR&D working group will begin eliciting inputs from a wider network, including universities and other agencies such as the Defense Threat Reduction Agency, National Oceanic and Atmospheric Administration, and the Nuclear Regulatory Commission (NRC). NNSA continues to play a key role in this activity and EFCOG is also engaged to provide a complex-wide perspective on NSR&D needs.

Further, a Department-wide database of all NSR&D activities will be developed and maintained by HSS. Starting in FY 2011, the funding and budget process currently in use for NSR&D will be revised to provide better peer review and also to divide the funds among a more optimal number of projects.

Finally, the DR is working with HSS and senior leadership to establish a position within HSS to act as the corporate clearinghouse for all NSR&D currently being performed throughout the Department, as well as related research from the broader scientific community. This is a broad-based collaboration with participation from SC, EM, the Laboratory Directors Council, NNSA, and HSS. NSR&D is further discussed under Recommendation 2004-1 in Section IV. C.

Application of Safety Instrumented Systems

HSS completed development of a draft DOE standard supporting the reliable design and maintenance of instrumented systems (including digital instrumentation and control systems) used in safety-significant applications at DOE defense nuclear facilities. An important aspect of this standard is the 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. The draft standard has received complex-wide review and has been tested for its usability and efficacy by several sites with new nuclear facility projects that are currently in the design phase.

Justifications for Continued Operations

HSS and the program offices completed a revision of DOE Guide 424.1-1A*, Implementation Guide for Use In Addressing Unreviewed Safety Question Requirements*, to better delineate the use of justifications for continued operations (JCOs) and to promote more consistent development and use of JCOs across the complex. HSS is supporting the implementation of this new guidance by developing training for DOE and contactor safety basis professionals who develop and/or review JCOs.

Validation of Safety Controls

HSS completed and issued new guidance for validation of safety controls, which was incorporated into a revision of DOE Guide 423.1-1, *Implementation* Guide *for Use in Developing Technical Safety Requirements*. This new guidance provides a detailed and standard approach for performing both initial and periodic re-validations of the important safety controls that protect the workers and public from potential accidents that could result in the release of hazardous material.

G. Office of Environmental Management Risk Reduction Efforts

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 EM mission. The EM program is one of the largest, most diverse, and most technically challenging cleanup efforts in the world.

Waste Treatment and Immobilization Plant

Hanford's WTP project is the largest facility design, construction, and commissioning project in the Federal sector. When operational, the WTP will vitrify (immobilize in glass) radioactive and chemical waste from Hanford's underground tanks. A Board public hearing on the WTP took place at Hanford October 7-8, 2010. At the end of the meeting, the Board expressed appreciation that DOE agreed to accelerate large-scale testing for mixing. The Board reiterated its recommendation that DOE consider a hot pilot plant for waste feed delivery. In addition, the Board expressed concerns regarding treatment of deposition velocity factors in air dispersion modeling for postulated accidents, the complexity of tank farm operations for waste feed, and the use of quantitative risk analysis. During the public meeting the Board focused mainly on three concerns:

- The ability of the plant to adequately mix the wastes after they are transferred from the Tank Farms into the plant
- The development and implementation of a hydrogen control strategy for dealing with the hydrogen gas that is generated by the high-level wastes
- The limitations on the plant's operating envelope resulting from the performance of mixing systems will result in more demands on the Tank Farms to deliver waste that meets restrictive waste acceptance criteria, or the need to provide alternative processing capability.

Shortly after the public meeting the Board issued Recommendation 2010-2: *Pulse Jet Mixing at the Waste Treatment and Immobilization Plant***,** which is discussed in Section IV. B.

Waste Treatment and Immobilization Plant Accomplishments

- As of March 2011, Completed: 83 percent of design; 54 percent of construction; and 58 percent overall.
- Pivoted focus from designing and constructing to constructing and commissioning.
- Developed and implemented a one-system integrated flowsheet to encompass the tank farms and WTP Project, with the expectation of operating both projects in tandem as one system.
- Closed the last of the External Flowsheet Review Team technical issues.
- Completed small scale testing of pulse jet mixing.
- Installed the first two melters in the Low-Activity Waste Vitrification Facility. When operational these melters will be the largest nuclear waste melters in the world, with a capacity to produce 15 metric tons of glass per day.
- Continued collaboration with the Board on resolving technical issues of key concern to include: hydrogen gas control, inadequate mixing, and deposition velocity.
- Made significant progress on, or completion of, a) High Level Waste HVAC design, b) Low Activity Waste design of mechanical handling equipment, c) installation of Balance-of-Facilities Glass Former Blend Building, d) installation of Low Activity Building HVAC ducts and support, e) design of Pre-Treatment facility Annex foundation, and f) installation of the Pre-treatment Facility hot cell crane girders.
- Developed Large Scale Integrated Test strategy to confirm mixing assumptions in design.

EM and CNS both continue to monitor resolution of WTP key technical issues, including: pulse jet mixing (PJM), material-at-risk /hydrogen in piping and ancillary vessels, and post-filtration solids formation. In particular, they have been working with the Office of River Protection (ORP) to evaluate the status of contractor efforts pertaining to existing and alternative mixing capabilities. Previously, the CNS provided technical assurance by bringing together experts from Bechtel National, the WTP contractor; and Parsons, the Savannah River Site (SRS) Salt Waste Processing Facility contractor, to resolve technical issues with solids formation at WTP. Large scale testing is planned to test proposed solutions to these and other mixing issues at WTP.

The Board has expressed concern regarding the Department's recommended value of deposition velocity (DV) in safety analyses. DV is a value used to assess the projected impact of accident scenarios on the maximally exposed offsite individual with respect to the evaluation guideline. The CNS staff, in conjunction with respected experts in the field, has evaluated the appropriate value of DV to use in accident analyses, and has proposed a methodology to determine appropriately conservative site-specific values for DV. Over the next year as methodologies and technical information continue to shed light on scientific refinements, HSS will work with the CNS to coordinate a complex-wide approach for making technically sound decisions on DV and other input parameters used in safety assessments such that the Department remains within conservative safety guidelines.

Safety Metrics

EM improved its overall safety performance, as measured by annual occupational injury rates, by reducing the total recordable case rate by 26 percent and the days away from work, on-job restriction or transfer case rate by 15 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 overall performance issues with several contractors at the Hanford and Idaho sites, including:

- Issuing guidance to the field on work planning expectations and best practices;
- Establishing corrective actions at Idaho to address ongoing safety performance issues; and,
- Working with Richland Operations Office on improving safety performance for one of their prime contracts.

Work Planning and Control

The Board has issued a series of letters dealing with issues associated with work planning and control over the past several years. As a result, EM issued work planning and control guidelines in April 2010, which outlined criteria which could be used for evaluating the effectiveness of site work planning and control processes. EM is using these guidelines for assessing field office programs as part of its oversight function.

In addition, EM has been working with EFCOG to establish a work management subgroup to improve work management processes. This subgroup has drafted a project plan to drive improvements in this area. Completion schedules are under development.

EM has also issued direction to its field sites to improve work control processes as part of their annual declaration for ISM and QA. This direction was distributed on July 1, 2010, and emphasizes processes to ensure that QA and ISM requirements are being properly flowed down from prime contractors to sub-contractors and vendors.

In March 2010, EM issued the second edition of its Standard Review Plan, which was developed as a collaborative effort between EM and CNS. The Standard Review Plan is designed to improve project performance by strengthening and formalizing the technical basis for evaluating the readiness of EM capital and major operating

projects. Corporately, the Standard Review Plan is designed to enhance transparency and clarity of requirements and expectations related to capital and construction projects, ensure a technically sound and rigorous review process, and promote consistency and stability in corporate decision making, including Critical Decisions. The Standard Review Plan consists of 28 stand-alone Review Modules and topical reports. In July, the CNS staff reviewed two additional modules for the EM Standard Review Plan. These were modules for facility disposition planning and final project closure. The accompanying *Standard Review Plan Handbook: Key Questions for Critical Decision Approval* was issued in July 2010.

Other Major Environmental Management Accomplishments for FY 2010

EM is making significant progress in several other 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 FY 2010.

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.

Site-specific progress and accomplishments towards risk reduction and improving safety at DOE's defense nuclear facilities are described in a supplement to this Annual Report to Congress that can be accessed through the DR's webpage at: http://www.hss.energy.gov/deprep/archive/annlrpts/rpts2con.asp.

H. Chief of Nuclear Safety: Support for Energy and Science Central Technical Authorities

DOE established Central Technical Authority (CTA) positions within the Department in response to Recommendation 2004-1, Oversight of Complex, High-Hazard Nuclear Operations. CNS and staff enable the Under Secretary of Energy and the Under Secretary for Science to execute their functions as Central Technical Authorities (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 delegated authorities, supporting project and program execution, and sponsoring crosscutting nuclear safety initiatives. Key CNS activities are discussed below.

Construction Project and Performance Reviews

The CNS and staff have provided leadership in establishing EM corporate Construction Project Reviews (CPRs), which have provided a direct path for CNS staff involvement in construction project technical issues. These reviews were instituted to assess the progress of each EM capital project and provide proactive recommendations for achieving its next critical decision stage within the approved cost and schedule. The first round of CPRs was completed in 2009. CPR committees evaluate project progress in areas such as: technical execution; cost, schedule, risk, and contracts management; prior reviews; environment, safety, and health; quality assurance; and commissioning.

An EM assist visit that was led by a CNS staff member supported the U-233 Downblending and Disposition Project at the Oak Ridge National Laboratory in August 2010 by providing advice in several critical areas regarding how project performance might be improved. The CNS also led the Startup and Commissioning subcommittee for the CPR at the WTP in November 2010.

The Depleted Uranium Hexaflouride Conversion Facility at Portsmouth, Ohio, and the Depleted Uranium Hexaflouride Conversion Facility at Paducah, Kentucky, started operations in FY 2010. CNS staff members were on the Operational Readiness Review (ORR) team that assessed the readiness of Uranium Disposition Services, LLC, to perform an initial startup of the Depleted Uranium Hexafluoride (DUF_6) Conversion Facility at the Portsmouth site April 6 - 16, 2010. Initial startup of this facility begins with the execution of hot

functional testing. Specifically, CNS staff team members evaluated Software Quality Assurance and DOE oversight readiness to support hot functional testing.

The CNS staff met with SRS safety analysis, management, SSO, and FR personnel to discuss and review the safety bases and ranking of the site's Hazard Category 2 and 3 facilities. The staff drafted risk ranking evaluations and collected documented safety analyses (DSAs) for Hanford's ORP and Richland Operations Office nuclear facilities and began compiling the data for risk ranking. Risk ranking of all EM high-hazard nuclear facilities was completed in December 2010.

Oversight

CNS continued to support line oversight activities through such means as nuclear criticality safety program evaluations, operational awareness reviews, programmatic assessments of ISM Systems, and CPRs, which are further discussed below. CNS also conducted 38 field oversight activity reviews.

Environmental Management Technical Authority

CNS continues to sponsor a series of training courses using recognized experts from established training programs (e.g., the Safety Basis Academy, and American Society of Mechanical Engineers (ASME)) to strengthen the sites' fundamental knowledge in critical technical areas. CNS' most recent course offerings include *ASME Code for the Design and Fabrication of Tanks, Vessels and Piping Systems with Applications at DOE Facilities*, which was held June 22-24, 2010. This three-day course addressed the design and fabrication requirements of ASME B31.3, *Process Piping*, ASME VIII, *Pressure Vessels*, and ASME III, *Nuclear Components*. CNS also sponsored the course *Seismic Design and Retrofit of Structures, Systems, and Components*, which was held September 8-10, 2010. The course described the codes and standards that apply to seismic design and addressed the development of seismic input, soil-structure interaction, in-structure response spectra, and analytical qualification of systems and components, testing, and earthquake experience data.

Federal Technical Training and Qualifications

The CNS serves as an agent representing the interests of the Under Secretary of Energy on the Department's Federal Technical Capability Program (FTCP). The purpose of the FTCP is to implement the requirements of DOE Order 426.1, *Federal Technical Capability,* to define requirements and responsibilities for meeting the DOE commitment to recruiting, deploying, developing, and retaining a technically competent workforce that will accomplish DOE missions in a safe and efficient manner. The Department strives to recruit and hire technically capable people; continuously develop the technical expertise of its existing workforce; and, within the limitations of executive policy and Federal law, retain critical technical capabilities at all times. The 2010 FTCP goals include identifying value-added training and linking it to existing or new Technical Qualification Program (TQP) competencies; accelerating the implementation of an electronic TQP for all aspects of training management; integrating security within the existing FTCP safety structure; and enhancing TQP objectives and criteria, including establishment of training effectiveness performance metrics.

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 activities included the following:

Integration of Safety into the Design Process

Defense Programs provided direct support to projects supporting the integration of safety into the design process. These activities included reviews of the early drafts of project safety design basis deliverables for the new Transuranic Waste (TRU Waste) Facility at LANL. Support was also provided in the technical review of the Radioactive Liquid Waste Treatment Facility Upgrades Project at LANL. These reviews have resulted in the identification and resolution of a number of safety

matters related to seismic response and chemical safety.

Line Oversight and Contractor Assurance Systems

NNSA has continued to increase emphasis on contractor responsibility and accountability by implementing contractor assurance systems so that federal oversight resources can be properly focused on areas of greatest impact on the safety, security, and efficiency of operations. Long-term measures of effectiveness for the contractor assurance systems and federal line oversight have been developed and will be affirmed at two NNSA sites.

Operational Readiness Reviews for Initial Startups and Restarts

Significant progress has been made in improving readiness review processes at LANL and the Los Alamos Site Office (LASO). NNSA successfully completed several restart activities during FY 2010. The readiness review and facility startup for the Highly Enriched Uranium Management Facility occurred in FY 2010, ahead of schedule. The readiness review for the Critical Experiments Facility (CEF) was also completed this year. The CEF is currently completing corrective actions to address review findings in addition to issues identified by the Board.

Fire Protection

NNSA worked to develop interim guidance on design and operational criteria for water-based automatic suppression systems that are classified as safety-class or safety-significant in nuclear safety basis documents. NNSA also began re-writing DOE Standard 1066, *Fire Protection Design Criteria,* to include insights learned from the NNSA working group on fire protection of active confinement ventilation systems (HSS is the technical lead and is responsible for issuing the standard and is working closely with DNFSB on technical matters).

Implementation Verification Reviews

NNSA, in partnership with EM, SC, and HSS, has completed development of a guide for conducting implementation verification reviews of safety basis control sets. This guide, issued on November 3, 2010, will serve to standardize processes and increase assurance that safety basis controls are effectively maintaining the safety posture at NNSA facilities.

Improving Criticality Safety Processes

NNSA standards have been revised and upgraded to bring them into alignment with the current ANSI/ANS-8 series of standards. NNSA criticality safety staff has been heavily involved in the design of new facilities to verify that contractor staff has identified the necessary design features early in the process. The Nuclear Criticality Safety Program manager tasked the Criticality Safety Support Group to provide recommendations regarding seismic design for criticality safety and hazard categorization related to criticality safety.

Improving Work Planning and Control

In response to six letters from the Board related to work planning and control (WPC) in 2009 and 2010, all NNSA and EM sites are working cooperatively with EFCOG and NNSA/EM Headquarters to improve activity level WPC. A project plan has been approved to benchmark existing practices and gather/develop tools from internal and external organizations to:

- Develop performance measures to evaluate contractor performance
- Establish a comprehensive WPC toolbox and guidance to address WPC activities and related assurance systems
- Improve the assessment planning and performance for WPC
- Communicate and share best practices
- Recommend changes to existing DOE directives and Federal direction related to WPC.

J. National Nuclear Security Administration: Chief of Defense Nuclear Safety

DOE established CTA positions within the Department in response to Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*. The CTA for NNSA is the NNSA Administrator while the Chief of Defense Nuclear

Safety (CDNS) provides technical support to the CTA.

From 2005-2007, CDNS conducted its first set 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 eighteen 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, CDNS completed the first series of follow-up reviews. Follow-up reviews 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. In 2010, CDNS initiated the second series of baseline reviews, which will extend into 2011.

Chief of Defense Nuclear Safety Accomplishments

- Developed an alternate hazard categorization methodology for use in NNSA nuclear facilities. If approved, the revised methodology may correct some non-conservative values in the existing approach, while providing significant additional margin for work with important isotopes. The proposed methodology and its basis will be provided to the Department for consideration in updating a Department-wide standard, expected in 2011.
- Developed and issued fire suppression systems design criteria to ensure fire suppression system effectiveness.
- Published quarterly technical bulletins to ensure consistent and effective safety approaches; provided ten technical articles and 18 answers to questions addressing high reliability organizations, unreviewed safety questions, technical safety requirements, selection of safety controls, integration of safety in design, fire suppression systems, and other contemporary matters.
- Worked with a NNSA site to refine an unprecedented simplification of the facility change review process; won senior line management agreement and established mechanisms to guard against abuse.
- Led an Operational Readiness Review of the Highly Enriched Uranium Materials Facility at the Y-12 National Security Complex. The review which was completed in an unprecedented eight days, enabled the facility startup ahead of schedule. The early startup will accelerate material consolidation and the goal of reducing the footprint of the security area.
- Provided senior staff to correct performance issues following two high profile startup failures. Subsequent reviews led to successful startups.
- Led an ISM verification at the Lawrence Livermore National Laboratory (LLNL) with HSS participation.
- Provided training to nuclear safety personnel through the safety basis professional program. Ensured course availability and initiated efforts to improve attendance by the target audience.

IV. Implementation of Board Recommendations

A. Overview of Board Recommendations

A Board recommendation is the most formal mechanism the Board can use to encourage action by the Department. The Board issues recommendations to the Secretary on issues or circumstances it believes must be resolved to assure adequate protection of public health and safety. The Secretary is required to respond to each Board recommendation within 45 days of its publication 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.

Open Recommendations

2000-1	Prioritization for Stabilizing Nuclear Materials
2001-1	High-Level Waste Management at the Savannah River Site
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
2009-2	Los Alamos National Laboratory Plutonium Facility Seismic Safety
2010-1	Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers
2010-2	Pulse Jet Mixing at the Waste Treatment and Immobilization Plant

The Department has taken longer than one year to complete most of the implementation plans for Board recommendations. Typically, the longer-than-one-year time-frames reflect the scope and technical complexity of the safety issues being addressed, the lengthy concurrence processes for revising DOE directives, and the challenges inherent in implementing and verifying complex-wide changes throughout the Department's defense nuclear facility federal and contractor workforce. Completion of the implementation plan for all open recommendations has required, or is currently projected to require, longer than one year. An update for each of the open recommendations is provided below. Appendix A, Table A.1 provides the date that DOE currently projects for completion of the implementation plan for each open recommendation. Twelve recommendations are currently open and 42 have been closed. Tables A.1 and A.2 in Appendix A provide a summary status of all open and closed recommendations, respectively.

The Board issued one new recommendation in FY 2010: Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety.* The Board also issued two new recommendations in early FY 2011: Recommendation 2010-1, *Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers* and Recommendation 2010-2, *Pulse Jet Mixing at the Waste Treatment and Immobilization Plant.* These 3 new recommendations are discussed in Section IV.B. The remaining 9 open recommendations are discussed in Section IV.C, with the exception of Recommendation 2002-3, *Requirements for the*

Design, Implementation, and Maintenance of Administrative Controls, which is discussed in Section IV.D. One recommendation was closed in FY 2010: Recommendation 2002-1, *Quality Assurance for Safety-Related Software*. This Recommendation was significant and complex and is discussed in Section IV. E.

B. Recently Opened Recommendations

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

The Board issued Recommendation 2009-2 on October 26, 2009. The Secretary accepted the recommendation on February 2, 2010, and transmitted the associated Implementation Plan to the Board on July 13, 2010. The recommendation calls for the Department to implement near-term actions and compensatory measures to reduce the consequences of potential seismic events at Los Alamos National Laboratory's (LANL) Plutonium Facility, and to develop and implement a strategy to reduce consequences from seismic events. The Board recently visited LANL and was pleased with the meaningful progress on this recommendation, and on December 17, 2010, accepted DOE's revised implementation plan.

The implementation plan identifies near-term actions and a long-term strategy to mitigate consequences of post-seismic events so that the DOE Evaluation Guideline of 25 rem is not challenged. The plan includes 11 primary deliverables. The first was provided to the Board just before the end of FY 2010 and completion is scheduled in FY 2011. The most recent update of the Plutonium Facility's DSA, currently under review by the LASO, is expected to reduce the consequences of a post-seismic fire event by a factor of 26 when compared to the 2008 DSA, which was the basis for the recommendation. The highest priority efforts in FY 2010 have been the development and implementation of actions to reduce the near-term risk of seismically-induced events, and the Seismic Analysis of Facilities and Evaluation of Risk (SAFER) Project for the Plutonium Facility. Completion of the SAFER Project is an essential prerequisite for identifying the most appropriate seismic upgrades.

2010-1: Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers

The Board issued Recommendation 2010-1 on October 29, 2010. This recommendation calls for the amendment of 10 CFR 830, *Nuclear Safety Management*, by incorporating a revised DOE Standard 3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facilities Documented Safety Analyses,* into the text as a requirement. The recommendation also requests that the revisions to DOE Standard 3009-94 reflect the Board's desire to see clearly delineated criteria for methodologies, accident scenarios, and mitigation options. The Board also recommends a set of requirements and criteria, as well as a clearly defined approval authority for safety analyses of defense nuclear facilities. The Board and the Department have been working together to clarify the complex technical details associated with this recommendation and the Department is now working on a path forward toward developing an implementation plan.

As discussed in Section III.B, The Department is currently undertaking a directives reform initiative that is proactively evaluating the methods used in determining the safety of defense nuclear facilities. This initiative was designed to reform departmental practices and enhances the effectiveness with which the Department meets its national security role, while appropriately ensuring the safety of the public. The progress of this initiative will, in part, address many of the concerns the Board has expressed in Recommendation 2010-1.

2010-2: Pulse Jet Mixing at the Waste Treatment and Immobilization Plant

The Board issued Recommendation 2010-2 on December 17, 2010. The recommendation reflects the Board's belief that the testing and analysis completed to date have been insufficient to establish, with confidence, that the pulse jet mixing and transfer systems being developed for future use at the Hanford WTP will perform adequately at full

scale. Before and after the WTP public hearing on October 6 and 7, 2010, DOE made significant progress on working the issues described in Recommendation 2010-2. Moreover, WTP plant representatives provided additional pertinent information regarding these issues in the public hearing record, which closed on January 7, 2011

C. Other Open Recommendations

2000-1: Prioritization for Stabilizing Nuclear Materials

The Board issued Recommendation 2000-1 on January 14, 2000. The Secretary accepted the recommendation on March 13, 2000. Revision 2 to the Implementation Plan was transmitted to the Board on July 22, 2002. The recommendation calls 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 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 with the exception of the stabilization of Hanford K-Basin sludge materials.

On June 30, 2010, DOE provided the Board with the Project Execution Plan (PEP) for Hanford K-Basin sludge, as discussed in the Department's previous January 27, 2010, letter to the Board. The PEP will be used to revise the Implementation Plan for this recommendation. The PEP describes the management approach, organizational roles and responsibilities, integrated baseline, and project management systems used to execute the Sludge Treatment Project (STP) at the Hanford Site. The primary purpose of the PEP is to support approval of Critical Decision-1 for Phase 1 of the STP Engineered Container/Settler Tank sludge disposition subproject. The scope of the PEP includes all of the subprojects of the STP. It is also intended to assist the Federal Project Director and Integrated Project Team in effectively managing all aspects of the project.

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

The Board issued Recommendation 2001-1 on March 23, 2001. The Secretary accepted the recommendation on May 18, 2001. Revision 6 to the Implementation Plan was transmitted to the Board on

Recommendation 2001-1 Implementation Plan
Revision 6
Interim Annual Commitments

Startup of the Salt Waste Processing Facility

- Complete delivery of ASME vessels: December 2011
- Complete Dark Cells at 139 ft. level: May 2012
- Complete roof at 154 ft. level: July 2013
- Begin cold commissioning: October 2014
- Begin SWPF radioactive operations: December 2015

Return Tank 48 to Tank Farm Service

- Complete 35 percent design of Tank 48 Treatment Project: December 2010
- Authorize procurement of Fluidized Bed Steam Reformer auger/grinder: December 2011
- Complete 90 percent design of Tank 48 Treatment Project: December 2012
- Receive FBSR major module skids: June 2013
- Begin Tank 48 FBSR radioactive operations: December 2014
- Process 25,000 gallons of Tank 48 materials: May 2015
- Return Tank 48 to Waste Service: December: 2016

Return Tank 50 to Higher Curie Tank Farm Service

- Award Effluent Treatment Project and Saltstone Procurements: June 2011
- Complete Modular Caustic Side Solvent Extraction Unit Decontaminated Salt Solution tie-in design: December 2011
- Complete Tank 50 Return to Service): December 2012

DWPF Recycle

- Reduce DWPF recycle by 1.25 Mgal/year: October 2014

November 24, 2010. The recommendation addresses the margin of safety and the amount of tank space at the SRS high-level waste system.

Significant progress continued on commitments outlined in Implementation Plan Revision 4, of July 11, 2006. Commitment 2.10, *Demonstrate the Viability of the Actinide Removal Process (ARP),*

entailed completing the first batch of waste through the ARP, and Commitment 2.13, *Begin Modular CSSX (Caustic Side Solvent Extraction) Unit (MCU) Radioactive Operations*, were completed in May 2008. These two Interim Salt Disposition processes subsequently decontaminated 143,000 gallons of salt waste in 2008, 560,000 gallons in 2009, and 292,000 gallons in 2010. A total of 1.17 million gallons have been processed since startup.

The Board sent a letter to EM-1 on March 31, 2009, noting concerns with three commitments in Implementation Plan Revision 4, which were not attainable. In 2009, these commitments were re-evaluated and Revision 5 to the plan was transmitted to the Board on September 22, 2009. Revision 5 deleted Commitment 3.10 (startup a DWPF evaporator), but also added a new Commitment 3.12 (reduce the volume of DWPF recycle by 1.25 million gallons per year). Revision 5 provided new dates for Commitment 2.14 and Commitment 3.9a and added an interim commitment 3.9b*, Return of Tank 48 to Waste Service.* On January 7, 2010, the Board requested that DOE evaluate the risks associated with the delayed commitments, and DOE provided a risk assessment on March 19, 2010.

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

The Board issued Recommendation 2004-1 on May 21, 2004. The Secretary accepted the recommendation on July 21, 2004. Revision 2 to the Implementation Plan was transmitted to the Board on October 12, 2006. The recommendation cites concerns regarding a number of safety issues related to CTA, delegations of safety responsibilities, technical capability, NSR&D, lessons learned from significant external events, and ISM. In response, the Department's Implementation Plan identified several broad areas for improvement, including strengthening federal safety assurance, learning from internal and external operating experience, revitalizing ISM implementation, and making improvements to NSR&D. The Board held a public meeting May 12, 2010, in Washington, DC to examine the Department's implementation of Recommendation 2004-1; this meeting is discussed in Section V.C.

One of the few remaining open issues in the recommendation concerns the control and funding of NSR&D within the Department. In general terms, there are three sources of funding for NSR&D activities within the Department: direct (or program) funding, indirect (or overhead) funding, and NSR&D "special" funding. A large number of departmental NSR&D activities are programmed and budgeted annually using appropriated funds in direct support of individual program and project requirements. Additionally, NSR&D funding is provided for site-wide crosscutting needs from site overhead accounts, Laboratory Directed Research and Development (LDRD), or Plant Directed Research and Development (PDRD). Finally, NNSA has established a pool of "special" NSR&D funding for crosscutting NSR&D activities that would benefit multiple sites, programs and/or projects. Sites are encouraged to submit NSR&D proposals annually in order to compete for these "special" funds. The NNSA NSR&D Working Group evaluates and prioritizes these proposals for "special" funding. NNSA continues to play a key role in coordinating this activity, and both EM and EFCOG are engaged to provide a complex-wide perspective on NSR&D needs.

A Department-wide database of all NSR&D activities will be developed and maintained by HSS. HSS holds the corporate perspective and cross-program reach necessary to coordinate NSR&D activities. Consequently, HSS is implementing a new function to coordinate NSR&D activities throughout the Department.

2004-2: Active Confinement Systems

The Board issued Recommendation 2004-2 on December 7, 2004. The Secretary accepted the recommendation on March 18, 2005. Revision 1 to the Implementation Plan was transmitted to the Board on July 12, 2006. The recommendation cites the benefits that would accrue if the Department changed 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 also recommended that the Department evaluate all new and existing defense nuclear facilities and enhance and update associated DOE directives and standards in light of this recommendation. Revision 1 to the Implementation Plan commits to review all Hazard Category 2 and 3 defense nuclear facilities to assure that the selected confinement strategy is properly justified and documented. In accordance with the plan, priority would be given to design and construction projects, including ongoing major modifications to existing facilities.

DOE has completed all commitments in the implementation plan except for providing a summary report on all the actions taken as a result of facility confinement ventilation system reviews and updating its Nuclear Safety Directives to incorporate guidance for the use of active confinement ventilation systems. Work began on completing these two remaining commitments in FY 2010. EM and NNSA prepared summary reports on any actions taken to upgrade confinement ventilation systems, and HSS developed a draft revision to DOE Guide 420.1-1, *Nonreactor Nuclear Safety Design Criteria and Explosive Safety Criteria Guide for Use with DOE Order 420.1, Facility Safety*. DOE anticipates completing these two commitments in FY 2011.

2005-1: Nuclear Material Packaging

The Board issued Recommendation 2005-1 on March 10, 2005. The Secretary accepted the recommendation on May 6, 2005, and transmitted the associated Implementation Plan to the Board on August 17, 2005. While acknowledging that DOE has made progress in the stabilization and storage of its excess nuclear materials, the Board recommended that DOE further enhance nuclear safety by developing technically justified criteria for packaging systems for nuclear materials on a DOE-wide level. The Department's implementation plan included several interim milestones and 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 repackaging activities to continue through 2014, with emphasis on higher risk materials earlier in the schedule.

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 LASO's Package Certification Group. DOE sites are developing detailed 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 Lawrence Livermore National Laboratory (LLNL) made significant progress in disposing of nuclear material so that repackaging would not be necessary, and LANL was able to repackage all of its very high and high risk materials into robust containers. In an August 16, 2010 letter, the Board extended congratulations to NNSA. The Letter acknowledged NNSA's robust repackaging of all plutonium-238 containers at the LANL Plutonium Facility by June 2010, a timely completion of an important safety improvement. In noting the repacking of approximately 160 containers into qualified safety-class containers, the Board also acknowledged that the effort had "significantly improved the safety posture of the Plutonium

Facility". In addition, LANL developed and tested a prototype container that would meet Manual 441-1-1 drop test and leak test criteria. The HSS Office of Nuclear Safety Policy and Assistance continued working with the Nuclear Material Packaging Storage Working Group on manual implementation and on developing consistent design, fabrication, test and surveillance methods, and documentation. A meeting is being planned for 2011 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. The Department expects to propose closure of this recommendation in FY 2012, after the production of the new storage containers and repackaging of very high and high risk material.

2007-1: Safety-related In Situ Nondestructive Assay (NDA) of Radioactive Materials

The Board issued Recommendation 2007-1 on April 25, 2007. The Secretary accepted the recommendation on June 28, 2007, and transmitted the associated implementation plan to the Board on October 24, 2007. The recommendation addresses the measuring of radioactive material holdup at defense nuclear facilities and cites three main issues: lack of standardized requirements for performing measurements, lack of design requirements for new facilities that would facilitate accurate holdup measurement, and lack of research and development activities for new instrumentation and/or measurement techniques.

CNS submitted a letter to the Board documenting the completion of Commitment 5.3.1, comprising Commitments 5.3.1.1 through 5.3.1.6, in the recommendation. Commitments 5.3.1.1 through 5.3.1.6 identify *in situ* Nondestructive Assay holdup measurement needs, including personnel training and qualification; equipment capabilities; directives; research and development; quality assurance; and oversight.

The DOE NDA Technical Support Group conducted a gap analysis using the outcomes of reviews of the extent-of-condition, the state-of-the-practice, and NDA holdup measurement needs of sites within the scope of the recommendation. The purpose of the reviews was to identify areas for improvement in training and qualification, equipment capabilities, directives, NSR&D, QA, and oversight.

CNS briefed CDNS in August 2010 on the status of this recommendation. The remaining actions described in the implementation plan are exclusive to the Y-12 Site. Although NNSA will henceforth assume responsibility for completing the remaining actions, CNS will continue to provide representation and support as requested.

2008-1: Safety Classification of Fire Protection Systems

The Board issued Recommendation 2008-1 on January 29, 2008. The Secretary accepted the recommendation on March 19, 2008, and transmitted the associated implementation plan to the Board on July 23, 2008. The recommendation calls for standards applicable to the design and

Recommendation 2008-1 Implementation Plan Initial Actions

- List and describe the fire protection systems utilized in safety-class and safety-significant applications for both existing and planned facilities.
- Identify industry codes and standards, such as those of the Nuclear Regulatory Commission and FM Global, applicable to fire protection sprinkler systems in high hazard or high value applications.
- Develop specific design and operational criteria and issue interim guidance for sprinkler systems used in safety-class and safety-significant applications.
- Develop 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.
- Revise 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.

operation of fire protection systems to be relied upon as a primary means of protecting the public and workers from radiological hazards at DOE defense nuclear facilities.

The Department established a working group that includes: EM, SC, NNSA Headquarters program offices, the CNS, the CDNS, and representatives from multiple sites and field offices. The group is working on the first of several actions in the implementation plan, which was developed consistent with ISM principles. During FY 2009 and FY 2010, the Department completed the first three of these actions and drafted specific design and operational criteria for the one fire protection system (fire barriers), other than sprinkler systems, that was determined to be warranted because of its frequent use in safety class or safety significant applications.

In addition, DOE made significant progress in revising DOE Standard 1066, to incorporate the new sprinkler and fire barrier guidance. DOE expects to complete revision of DOE Standard 1066, *Fire Protection Design Criteria*, in FY 2011.

2009-1: Risk Assessment Methodologies at Defense Nuclear Facilities

The Board issued Recommendation 2009-1 on July 30, 2009. The Secretary accepted the recommendation on November 3, 2009, and transmitted the associated implementation plan to the Board. The recommendation calls for adequate policies and associated standards and guidance on the use of quantitative risk assessment (now referred to as probabilistic risk assessment) methodologies at the defense nuclear facilities. The Board noted that the original implementation plan did not include a commitment to develop a risk assessment policy. On April 27, 2010, the Secretary transmitted Revision 1 to the implementation plan to the Board. The revision specifically commits to integrating the Department's expectations on the use of risk assessment in nuclear safety into its revised Nuclear Safety Policy.

DOE has completed efforts on: developing and issuing an information notice on risk assessments, establishing a risk assessment technical experts working group, and developing and conducting a risk assessment training course. In addition, DOE completed data collection on its risk study, drafted and provided for DOE-wide review a revision to the Nuclear Safety Policy, and began efforts to develop a risk assessment technical standard. DOE is continuing these efforts and anticipates issuing a final revised Nuclear Safety Policy and a review draft risk assessment standard in FY 2011.

D. Recommendations Proposed for Closure

The Department proposed closure of one recommendation in FY 2010, Recommendation 2002-1, *Quality Assurance for Safety-Related Software.* As discussed in Section IV. E., that Recommendation is now closed. In addition, the Department proposed closure of one recommendation prior to FY 2010 that remains open: Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls.*

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

The Board issued Recommendation 2002-3 on December 11, 2002. The Secretary accepted the recommendation on January 31, 2003, and transmitted the associated implementation plan to the Board on June 26, 2003. The recommendation cites technical inadequacies in a number of safety-related administrative controls (now called specific administrative controls) proposed for or in use at various defense nuclear facilities. The Board noted that in many cases DOE and/or its contractors have asserted that the methods used to establish specific administrative controls comply with existing DOE directives. However, after further analysis, the Board concluded that the DOE directives system did not contain adequate requirements for the design, implementation, and maintenance of specific administrative controls.

Recommendation 2002-3 Implementation Plan

Key Elements

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

Examples of Completed Actions and Commitments

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

Based on completion of all Implementation Plan commitments, on January 4, 2007, the Secretary proposed closing this recommendation. 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.

HSS has undertaken an effort to bolster the Department's actions to support closure of this Recommendation. These efforts involved site, program office, and HSS evaluations of specific administrative control implementation at targeted sites. Sites identified by HSS include LANL, Y-12, LLNL, Pantex, SRS, Sandia National Laboratories (SNL), and the East Tennessee Technology Park. Program offices are working with these sites to ensure that the formal corrective actions associated with the above findings are closed on a reasonable schedule. Additionally, there is an expectation that the program offices must verify more broadly that specific administrative controls are being evaluated across all of the program sites. DOE anticipates completing these reviews and being in a position to again seek the Board's agreement in 2011 that Recommendation 2002-3 should be closed.

E. Recently Closed Recommendations

2002-1: Quality Assurance for Safety-Related Software

On February 5, 2010, the Secretary requested formal closure of Recommendation 2002-1, citing completion of all actions outlined in the implementation plan and noting that completion of the implementation plan had significantly improved the Department's safety software quality assurance practices. On April 14, 2010, the Board concurred that the recommendation had been completed and the recommendation was closed. In its concurrence letter, the Board recognized the "efforts of the DOE personnel who worked diligently for several years to develop DOE's framework for quality assurance for safety software."

The Board issued Recommendation 2002-1 on September 23, 2002. The Secretary accepted the recommendation on November 21, 2002 and transmitted the associated Implementation Plan to the Board on March 13, 2003. The recommendation cited 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 in distributed control systems, supervisory control and data acquisition systems and programmable logic controllers required appropriate quality assurance controls to provide adequate protection for the public, the workers, and the environment.

HSS and its predecessors were responsible for the overall execution of the implementation plan. However, responsibility for implementing software QA remained with the line programs. The line programs provided many of the deliverables called for in the plan. Since June 2003, the Department has provided periodic briefings to the Board and its staff and has completed 26 implementation plan commitments. EM reported all of its commitments as completed in September 2005, and NNSA reported all of its commitments as completed in November 2006.

V. Interface Activities

A. Briefings, Site Visits, and Other Board Interactions

The Board and its staff regularly visit the Department's defense nuclear facilities to review the implementation of safety initiatives, examine safety facilities and operations, and attend briefings. A list of site visits made by the Board and its staff in FY 2010 is available on the DR's website (https://www.hss.doe.gov/deprep/).

B. Responses to Board Reporting Requirements

During FY 2010, the Board issued 23 formal reporting requirements as shown in Appendix A, Table A.3. Table A.4 lists the 3 active reporting requirements from prior years and Table A.5 lists the 21 letter commitments DOE completed during FY 2010.

C. Public Meetings

The Board held one public meeting in FY 2010. It was held May 12, 2010, in Washington, D.C. to examine the Department's implementation of Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*. The Board reviewed DOE's and NNSA's current oversight and safety management of the contracts and contractors they rely on to accomplish their assigned missions. The Board focused on what impact DOE's and NNSA's new initiatives, including changes to DOE directives, contractor oversight, and governance, might have on assuring adequate protection of the health and safety of the public and workers at DOE's defense nuclear facilities. DOE and NNSA senior leaders articulated their views on the role of line and independent oversight to safely accomplish work at defense nuclear facilities.

In addition, a public meeting was held very early in FY 2011. This meeting took place October 7-8, 2010, in Pasco, Washington and discussed concerns associated with safety-related aspects of the design and construction of DOE's WTP at the Hanford Site. Technical issues reviewed included (1) changes in safety-related design criteria resulting from modification of the material-at-risk, (2) changes in design strategy to address hydrogen in pipes and ancillary vessels, (3) criticality safety concerns and other safety-related risks for the pulse jet mixing system, (4) reclassification of safety-related systems, structures, and components, and (5) safety-related design aspects of new facilities or modifications of existing facilities needed to deliver high level waste feed.

D. Safety Issues Management System

The Department established an interactive database management tool, the Safety Issues Management System (SIMS), in August 1995 to track the status of DOE commitments to the Board. At the end of FY 2010, the Department was tracking approximately 50 open recommendation commitments and 25 open letter commitments.

During FY 2010, the DR found SIMS was in need of upgrading to retain its historic usefulness, and the DR implemented several system upgrades, including new key word search capabilities and a new capability to generate a summary of the background and the Board concerns associated with each open commitment. The Board was pleased to hear of these SIMS upgrades.

E. 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 DOE

defense nuclear facilities. The Department also regularly receives and responds to requests from Board members and staff for specific information about site or Departmental activities. The DR 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/.

F. Board Interface Manual

The governing instruction for Departmental interaction with the Board is DOE Manual 140.1-1B, *Interface with the Defense Nuclear Facilities Safety Board.* Since June 2008, the DR's Office has been co-leading a DOE-wide team to revise and convert the manual into a DOE Order 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 a DOE Order. The DR is in the process of making additional changes, including addressing comments received from the Department's internal "red team." Once the revisions are completed, the DOE 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 with the Board as the Board and the Department meet their requirements and fulfill their respective responsibilities under the Atomic Energy Act, as amended
- Considers thoroughly the recommendations and other safety information and advice provided by the Board
- Meets its commitments made in response to Board recommendations and ensures that actions taken pursuant to Board recommendations and other safety information and advice received from the Board are tracked from planning though completion.

Appendix A. Summary Status of Board Recommendations and Reporting Commitments

Table A.1: Open Recommendations

Rec #	Title	Date Opened	Timeframe for Completing Implementation Plan
2000-1	Prioritization for Stabilizing Nuclear Materials	01/14/2000	Late 2015 (See Sect. IV.C)
2001-1	High-Level Waste Management at the Savannah River Site	03/23/2001	Late 2016 (See Sect. IV.C.)
2002-3	Requirements for the Design, Implementation, and Maintenance of Administrative Controls	12/11/2002	2011 (See Sect. IV.D.)
2004-1	Oversight of Complex, High-Hazard Nuclear Operations	05/21/2004	Not before 2012 (See Sect. IV.C.)
2004-2	Active Confinement Systems	12/07/2004	2011 (See Sect. IV.C.)
2005-1	Nuclear Material Packaging	03/10/2005	All Plan Commitments Complete (See Sect. IV.C.)
2007-1	Safety-Related In Situ Nondestructive Assay of Radioactive Materials	04/25/2007	2012 (See Sect. IV.C.)
2008-1	Safety Classification of Fire Protection Systems	01/29/2008	2011 (See Sect. IV.C.)
2009-1	Risk Assessment Methodologies at Defense Nuclear Facilities	07/30/2009	2011 (See Sect. IV.C.)
2009-2	Los Alamos National Laboratory Plutonium Facility Seismic Safety	10/26/2009	2011 (See Sect. IV.B.)
2010-1	Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers	10/29/2010	Plan Under Development (See Sect. IV.B.)
2010-2	Pulse Jet Mixing at the Waste Treatment and Immobilization Plant	12/17/2010	Plan Under Development (See Sect. IVB.)

Table A.2: Closed Recommendations

Rec #	Title	Date Opened	Date Closed
90-1	Savannah River Operator Training	02/22/1990	10/27/1992
90-2	Codes and Standards	03/08/1990	10/24/1995
90-3	Hanford Waste Tanks	03/27/1990	05/01/1992
90-4	Rocky Flats Operational Readiness Reviews	05/04/1990	02/16/1995
90-5	Rocky Flats Systematic Evaluation Program	05/18/1990	10/24/1995
90-6	Rocky Flats Plutonium in the Ventilation Ducts	06/05/1990	10/24/1995
90-7	Hanford Waste Tanks	10/12/1990	09/04/1996
91-1	Safety Standards Program	03/07/1991	10/27/1992
91-2	Reactor Operations Management Plan	03/27/1991	10/27/1992
91-3	Waste Isolation Pilot Plant	04/26/1991	05/01/1992
91-4	Rocky Flats Building 559 Operational Readiness Review	09/30/1991	05/01/1992
91-5	Savannah River K Reactor Power Limits	12/19/1991	04/07/1993
91-6	Radiation Protection	12/19/1991	11/08/1996
92-1	Operational Readiness of the HB-Line at Savannah River	05/21/1992	10/27/1992
92-2	Facility Representatives	05/28/1992	10/01/1996
92-3	HB-Line Operational Readiness Reviews	05/29/1992	02/03/1993
92-4	Multi-Function Waste Tank Facility at Hanford	07/06/1992	03/24/2009
92-5	Discipline of Operations During Changes	08/17/1992	10/24/1995
92-6	Operational Readiness Reviews	08/26/1992	10/24/1995
92-7	Training and Qualification	09/22/1992	11/05/1993
93-1	Standards Utilization in Defense Nuclear Facilities	01/21/1993	03/25/1999
93-2	The Need for Critical Experiments Capability	03/23/1993	12/31/1997
93-3	Improving Technical Capability in Defense Nuclear Programs	06/01/1993	11/09/1999
93-4	Environmental Restoration Management Contracts	06/16/1993	06/28/1996

Rec #	Title	Date Opened	Date Closed
93-5	Hanford Waste Tanks Characterization Studies	07/19/1993	11/15/1999
93-6	Maintaining Access to Nuclear Weapons Expertise	12/10/1993	04/27/1999
94-1	Improved Schedule for Remediation	05/26/1994	04/29/2008
94-2	Safety Standards for Low-Level Waste	09/08/1994	12/22/1999
94-3	Rocky Flats Seismic and Systems Safety	09/26/1994	05/27/1999
94-4	Deficiencies in Criticality Safety at Oak Ridge, Y-12	09/27/1994	03/12/1999
94-5	Integration of Rules, Orders, and Other Requirements	12/29/1994	06/10/1999
95-1	Improved Safety of Cylinders Containing Depleted Uranium	05/05/1995	12/16/1999
95-2	Integrated Safety Management	10/11/1995	11/21/2006
96-1	In-Tank Precipitation System at Savannah River	08/14/1996	03/29/2002
97-1	Safe Storage of Uranium-233	03/03/1997	04/29/2008
97-2	Continuation of Criticality Safety	05/19/1997	08/07/2003
98-1	Resolution of Safety Issues Identified by DOE Internal Oversight	09/28/1998	03/28/2008
98-2	Safety Management at the Pantex Plant	09/301998	12/16/2008
99-1	Safe Storage of Pits	08/11/1999	09/09/2005
2000-2	Configuration Management, Vital Safety Systems	03/08/2000	08/08/2007
2002-1	Quality Assurance for Safety-Related Software	09/23/2002	04/14/2010
2002-2	Weapons Laboratory Support of the Defense Nuclear Complex	10/03/2002	11/22/2005

Table A.3: Formal Reporting Requirements Issued by the Board in FY 2010

Date Issued	Reporting Requirements	Days to Report
12/02/2009	A report outlining actions taken or planned by Los Alamos Site Office and Los Alamos National Security to address the work planning and control deficiencies	90
12/02/2009	A report presenting the Department's assessment of the issues on the existing designs of the Waste Treatment Plant facilities	90
12/02/2009	Quarterly report on the status of the Structural Peer Review Team efforts regarding Waste Treatment Plant facilities	Quarterly
01/06/2010	A report on the safety issues associated with inadequate pulse jet mixing at the Waste Treatment and Immobilization Plant	60
01/25/2010	Briefing on the communications of W76 data from Sandia National Laboratories to Pantex	30
01/27/2010	A report and briefing on the Lawrence Livermore National Laboratory Tritium Process Station Readiness Assessment	60
03/12/2010	A report on the Washington River Protection Solutions work planning and controls deficiencies	90
03/15/2010	A written response regarding the applicability of DOE-STD-3009 Evaluation Guideline	30
03/15/2010	A report providing site-specific information regarding DOE-STD-3009 implementation	60
04/29/2010	A report on addressing age-related degradation of H-Canyon at Savannah River Site	90
05/05/2010	A report and briefing on the DOE directives review criteria	15
05/05/2010	Bi-Monthly briefings on DOE safety and security reform and DOE directives consolidation	Bi-Monthly
05/05/2010	A report addressing the Environmental Management flow-down of quality assurance requirements	60
05/21/2010	Briefing on the technical justification of the hazard categorization of the Z machine at Sandia National Laboratories	45
05/21/2010	A report on the deposition velocity to be used for both Waste Treatment and Immobilization Plant and complex wide	120

Date Issued	Reporting Requirements	Days to Report
06/14/2010	A report on work planning and control deficiencies identified at Lawrence Livermore National Laboratory	90
07/06/2010	Briefing on issues related to the implementation of DOE-NA-STD-3016-2006 *Hazard Analysis Reports for Nuclear Explosive Operations* at Pantex	60
08/05/2010	A report and briefing on analytical and implementation deficiencies in the Hanford Tank Farms Documented Safety Analysis	60
08/05/2010	A report and briefing on deficiencies in the accident analysis, control set, and safety system design for the Critical Experiments Facility at Nevada Test Site	90
08/05/2010	An assessment on adequate and effective safety profile for Critical Experiments Facility Expertise	Prior to performing critical experiments
08/06/2010	A written responses to questions to be used to prepare for the October 7-8, 2010 Defense Nuclear Facilities Safety Board public meeting	30
09/22/2010	A report on deficiencies in the electrical safety program and the 480V Motor Control Center in the Fire Water Pump Building at the Waste Isolation Pilot Plant	90
09/23/2010	A report on actions to correct work planning and control deficiencies by the Richland Operations Office and CH2M Hill Plateau Remediation Company	90

Table A.4: Active Reporting Requirements Issued by the Board in Prior Years

Date issued	Reporting Requirements	Days to Report
08/07/2003 (Modified 1/28/2008)	Annual report on the Department's Nuclear Criticality Safety Program	Annually
09/09/2005	Annual briefing on the contents of the annual revision to the Pantex Nuclear Material Management Program	Annually
03/13/2007	Annual report on the annual assessment of the 9212 Complex, and the progress on the Uranium Processing Facility (UPF)	Annually

Table A.5: Statutory Letter Commitments Completed in FY 2010

Letter #	Commitment Title	Date Completed
SL09-009	Briefing on the plans to modify and upgrade the fire protection systems in the Device Assembly Facility at the Nevada Test Site	11/10/2009
SL05-026	Annual briefing on the contents of the annual revision to the Pantex Nuclear Material Management Program	11/18/2009
SL03-031	Annual report on the Department's Nuclear Criticality Safety Program	01/19/2010
SL10-004	A report and briefing on the Lawrence Livermore National Laboratory Tritium Process Station Readiness Assessment	03/24/2010
SL09-014	A report presenting the Department's assessment of the issues on the existing designs of the Waste Treatment Plant facilities	03/29/2010
SL09-013	A report outlining actions taken or planned by Los Alamos Site Office and Los Alamos National Security to address the work planning and control deficiencies	03/29/2010
SL10-003	Briefing on the communications of W76 data from Sandia National Laboratories to Pantex	05/12/2010
SL10-001	A report on the safety issues associated with inadequate pulse jet mixing at the Waste Treatment and Immobilization Plant	05/17/2010
SL10-009	A report and briefing on the DOE directives review criteria	05/20/2010
SL07-004	Annual report on the annual assessment of the 9212 Complex, and the progress on the Uranium Processing Facility (UPF)	06/3/2010
SL10-005	A report on the Washington River Protection Solutions work planning and controls deficiencies	06/25/2010
SL10-007	A written response regarding the applicability of DOE-STD-3009 Evaluation Guideline and a report providing site-specific information regarding DOE-STD-3009 implementation	06/30/2010
SL10-009	Bi-Monthly briefings on DOE safety and security reform and DOE directives consolidation	07/27/2010
SL10-012	Briefing on the technical justification of the hazard categorization of the Z machine at Sandia National Laboratories	07/29/2010
SL10-008	A report on addressing age-related degradation of H-Canyon at Savannah River Site	08/13/2010
SL10-010	A report addressing the Environmental Management flow-down of quality assurance requirements	09/2/2010
SL10-017	A written responses to questions to be used to prepare for the October 7-8, 2010 Defense Nuclear Facilities Safety Board public meeting	09/8/2010
SL10-014	A report on work planning and control deficiencies identified at Lawrence Livermore National Laboratory	09/13/2010
SL10-015	Briefing on issues related to the implementation of DOE-NA-STD-3016-2006 *Hazard Analysis Reports for Nuclear Explosive Operations* at Pantex	09/14/2010
SL10-011	A report on the deposition velocity to be used for both Waste Treatment and Immobilization Plant and complex wide	09/20/2010
SL09-014	Quarterly report on the status of the Structural Peer Review Team efforts regarding Waste Treatment Plant facilities	09/21/2010

Appendix B. Acronyms and Abbreviations

ANS	American Nuclear Society
ASME	American Society of Mechanical Engineers
Board	Defense Nuclear Facility Safety Board
CDNS	Chief of Defense Nuclear Safety
CEF	Critical Experiments Facility
CNS	Chief of Nuclear Safety
CTA	Central Technical Authorities
CPR	Construction Project Review(s)
D&D	Decontamination and Decommissioning
DOE	Department of Energy
DR	Departmental Representative to the DNFSB
DSA	Documented Safety Analyses
DWPF	Defense Waste Processing Facility
EFCOG	Energy Facilities Contractors Group
EM	Office of Emergency Management
ERDF	Environmental Restoration Disposal Facility
FR	Facility Representatives
FTCP	Federal Technical Capability Program
FY	Fiscal Year
HSS	Office of Health, Safety & Security
INTEC	Idaho Nuclear Technology and Engineering Center
ISM	Integrated Safety Management
JCO	Justifications for Continued Operations
LANL	Los Alamos National Laboratory
LASO	Los Alamos Site Office
LLNL	Lawrence Livermore National Laboratory
MA	Office of Management
NE	Office of Nuclear Energy
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
NSR&D	Nuclear Safety Research & Development
ORP	Office of River Protection
PEP	Project Execution Plan
PJM	Pulse Jet Mixing
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
SAFER	Seismic Analysis of Facilities and Evaluation of Risk
SC	Office of Science
SIMS	Safety Issues Management System
SRS	Savannah River Site
SSO	Safety Systems Oversight
STP	Sludge Treatment Project
SWPF	Salt Waste Processing Facility
TQP	Technical Qualifications Program
USACE	U.S. Army Corps of Engineers
WPC	Work Planning and Control
WTP	Waste Treatment and Immobilization Plant