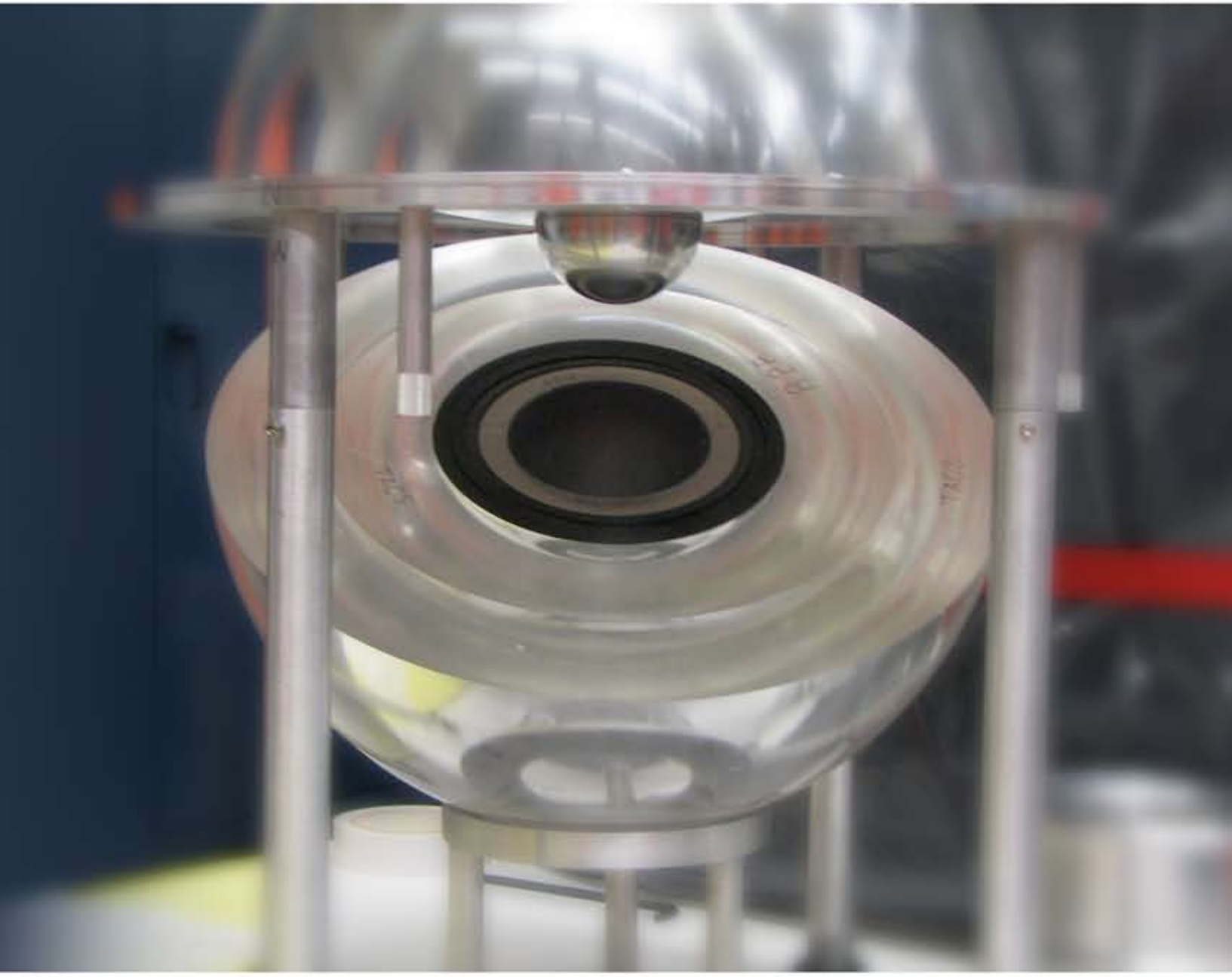
2006 Annual Report to Congress

DEPARTMENT OF ENERGY ACTIVITIES RELATING TO THE DEFENSE NUCLEAR FACILITIES SAFETY BOARD



U.S. Department of Energy • March 2007

Annual Report To Congress

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

Calendar Year 2006

U.S. Department of Energy
Washington, DC 20585

March 2007

The Secretary of Energy
Washington, DC 20585

March 14, 2007

The Honorable Richard Cheney
President of the Senate
Washington, D.C. 20510

Dear Mr. President:

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

In 2006, significant accomplishments were made in the safety and reliability of the defense nuclear complex. The Office of Environmental Management has now completed environmental activities at five sites. On August 30, 2006, the Office of Health, Safety and Security was created to provide corporate-level leadership and strategic vision necessary to better coordinate and integrate health, safety, environment, security, enforcement, and independent oversight programs at the Department.

During 2006, the Department received no new recommendations from the Board. On November 21, 2006, the Board closed recommendation 95-2, *Safety Management*. The Department made excellent progress on resolving open Board recommendations and implementing initiatives to ensure public health and safety. These measures are described in the report and include reducing risk through stabilization of excess nuclear materials and maintaining a vigorous facility representatives program.

If you have any questions, please contact me or Ms. Jill L. Sigal, Assistant Secretary for Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,

Samuel W. Bodman

Enclosure

Executive Summary

The Department of Energy (the Department, or DOE) submits an Annual Report to Congress each year detailing the Department's activities relating to the Defense Nuclear Facilities Safety Board (the Board), which provides advice and recommendations to the Secretary of Energy (the Secretary) regarding public health and safety issues at the Department's defense nuclear facilities.

In 2006, the Department continued ongoing activities to resolve issues identified by the Board through formal recommendations and correspondence, staff-issued reports pertaining to Department facilities, and public meetings and brie ngs. Additionally, the Department is implementing several key safety initiatives to address and prevent safety issues: risk reduction through stabilization of excess nuclear materials, the Facility Representative Program, independent oversight and performance assurance, quality assurance activities, the Federal Technical Capability Program (FTCP), and incorporating safety into the design process.

On August 30, 2006, the Secretary created the Of ce of Health, Safety and Security, led by the Chief Health, Safety and Security Of cer, to strengthen and improve the health, safety, and security of the Department's workers, facilities, and the public. The new of ce will help formulate and implement health, safety, and security policy; provide assistance to Department sites; conduct oversight through rigorous field inspections; address cross-cutting issues; conduct enforcement activities; and carry out other functions previously performed by the Of ce of Environment, Safety and Health and the Of ce of Security and Safety Performance Assurance.

The following summarizes the key activities addressed in this Annual Report.

Key Activities Pertaining to Board Recommendations

New Board Recommendations

The Department received no new Board recommendations during 2006.

Recommendations Closed

The Board agreed with DOE's closure of one recommendation during 2006.

Recommendation 95-2, *Safety Management* (95-2)

On November 21, 2006, the Board agreed with DOE's closure of Recommendation 95-2.

Board Recommendation 95-2 called for: (1) an institutionalized process for ensuring that environment, safety, and health requirements are met; (2) graded safety management plans for the conduct of operations; (3) a prioritized list of facilities based on hazards and importance; (4) direction and guidance for the safety management process; and (5) measures to ensure availability of technical expertise to implement the streamlined process effectively.

The Secretary accepted the recommendation in January 1996. The Secretary approved the implementation plan and provided it to the Board in April 1996. The Department completed all implementation plan commitments between 1996 and 1998. Integrated Safety Management (ISM) remains the Department's central framework for completing work while protecting the public, the workers, and the environment. ISM is also the core of the Department's commitment to building a robust safety culture.

As part of the Department's implementation plan to implement Board Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*, the Department embarked upon a series of actions to revitalize ISM implementation, with particular focus on

strengthening DOE Federal actions and contractor continuous improvement. These actions included establishment of a DOE-wide ISM Champion and DOE ISM Champions for each program and eld of ce. In October 2006, the Department completed development and issuance of a new DOE directive on ISM, the ISM System Manual, and DOE Manual 450.4, *Integrated Safety Management System Manual*. The Department conducted three workshops during 2006 to promote revitalization and sharing of lessons learned. In November 2006, the Board closed Recommendation 95-2.

Recommendations Proposed for Closure

- The Secretary proposed closure of one Board recommendation during 2006: Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems*. This recommendation remains open.

- The Secretary proposed closure of three other Board recommendations issued prior to 2006: (1) Board Recommendation 92-4, *Multi-Function Waste Tank Facility at the Hanford Tank Farms*; (2) Board Recommendation 94-1, *Improved Schedule for Remediation in the Defense Nuclear Facilities Complex*; and (3) Board Recommendation 98-1, *Resolution of Safety Issues Identified by DOE Internal Oversight*. These three recommendations remain open.

Other Active Recommendations

- A total of 13 Board recommendations are currently open. The Secretary has proposed closure of four of these recommendations.

- The Department is actively working through its remaining nine implementation plans to resolve the safety issues identi ed in the Board recommendations.

- Reasons for recommendations remaining open vary by recommendation, and include: (1) additional time required to ensure that the safety issue resolutions are fully institutionalized and successful, (2) signi cant scope and magnitude of effort involved in adequate safety issue resolution, and (3) changes to the resolution approach based on more recent experience.

- Most Board recommendations written since 1994 require multi-year implementation plans to resolve the identi ed safety issues.

Key Activities Pertaining to Department Key Safety Initiatives

Office of Health, Safety and Security

Creation of the new office provides for an enhanced integration of functions formerly assigned to the Of ce of Security and Safety Performance Assurance; the Of ce of the Assistant Secretary for Environment, Safety and Health; and the Departmental Representative to the Defense Nuclear Facilities Safety Board. The new of ce has undertaken a number of new activities relating to worker health and safety, including revising applicable rules, simplifying interface with the Board, integrating reliability criteria in the design process, and developing corporate indicators to provide clarity in reporting corporate safety performance. Additionally, the of ce has in place a longstanding, performance-based independent oversight program that assesses contractor self-assessments, line management evaluations, and worker performance.

Risk Reduction Through Stabilization of Excess Nuclear Materials and Waste

- Completed cleanup of Rocky Flats Environmental Technology Site (RFETS) and transferred to Legacy Management.

- Completed environmental activities at Fernald Environmental Management Project (FEMP), Columbus Environmental Management Project (CEMP), Kansas City Plant, and Lawrence Livermore National Laboratory (LLNL).

- Made over 1,125 shipments to the Waste Isolation Pilot Plant (WIPP).

- Disposed of over 10,500 cubic meters of transuranic waste at the WIPP.

Electrical Safety

- The Department and the Energy Facility Contractors Group (EFCOG) developed the Electrical Safety Improvement Project Plan. The plan was approved by senior Department managers in January 2006. This plan was developed in response to Secretary Bodman's challenge to the Department to improve electrical safety performance. The plan represents a formal approach for managing improvement in several electrical safety focus areas and integrates current DOE and contractor electrical safety efforts.

- In August 2006, the Of ce of Environment, Safety and Health (now a part of the Of ce of Health, Safety and Security) issued Special Operations Report 2006-1, *Electrical Safety*, to inform DOE and contractor line management on the recent performance of electrical work across the DOE complex. The report recommended further action by Department organizations to improve electrical safety practices.

Facility Representative Program

- The Department's Facility Representative Program continues to be a centerpiece of the Department's efforts to upgrade Federal technical capabilities. Approximately 200 Facility Representatives across the complex provide real-time oversight of operational activities that are important to mission accomplishment and public safety. The Department requires Facility Representatives to initially qualify on rigorous technical standards and to requalify every three years.

- In 2005, Field Of ce Managers nominated 12 people for the Department's Facility Representative of the Year award, re ecting strong eld management support for the program and a high level of achievement across the Department.

- The Department continued with its efforts to improve the Facility Representative program. As a result, DOE-STD-1063-2006, *Facility Representatives,* was revised and updated to address a more rigorous staf ng analysis methodology.

Independent Oversight

- On August 30, 2006, the Secretary created the Of ce of Health, Safety and Security to provide corporate-level leadership and strategic vision necessary to better coordinate and integrate health, safety, environment, security, enforcement, and independent oversight programs in the Department. Within the new structure, the Of ce of Independent Oversight provides independent assessment of the effectiveness of policies and programs in safeguards and security; cyber security; emergency management; environment, safety, and health; and other critical functions of immediate interest to the Secretary, the Deputy Secretary, and the Administrator of the National Nuclear Security Administration.

Quality Assurance Activities

- The rst step in assessing the implementation of the Department's Quality Assurance Program, as required by DOE Order 414.1C, *Quality Assurance,* was performed in a Department-wide survey to determine status. The survey results indicated that a number of Headquarters of ces are in the process of developing a Quality Assurance Program and that most field offices and their contractors have a Quality Assurance Program in place.

- The Department continued its efforts to establish a rigorous and effective safety Software Quality Assurance Program.

- In 2006, the DOE Of ce of Health, Safety and Security initiated an effort to better utilize data from the Occurrence Reporting and Processing System to extract and trend quality assurance related information to identify possible areas of vulnerability pertaining to Quality Assurance Program implementation.

Federal Technical Capability Program Activities

- In October 2006, Revision 2 of the implementation plan for Board Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations* was issued, directing the FTCP to make the corporate accreditation process voluntary, rather than

mandatory, and to provide for a follow-on line management review of the effectiveness of the FTCP Corrective Action Plan.

- In December 2006, the FTCP prepared a revision to the Corrective Action Plan that addresses both of these changes. The revised Corrective Action Plan includes 14 actions to be completed in 2007 and 2008.

Chief of Nuclear Safety

- The Of ce of the Chief of Nuclear Safety (CNS) was established in January 2006 in response to Board Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*, and the results of the Space Shuttle orbiter Columbia accident investigation. The mission of the CNS and staff is to support the Under Secretary of Energy and the Under Secretary for Science in carrying out their functions as Central Technical Authorities and to strengthen line management oversight of nuclear facilities.

Worker Protection Initiatives and Improvements

- The Department continued demonstrating its commitment to ensuring that DOE and DOE contractor employees are provided with a safe work environment. Most notably, on February 9, 2006, DOE published in the Federal Register a Final Rule: 10 CFR 851, *Worker Safety and Health Program*. The Rule requires that DOE contractor workers be provided with a workplace that is free from recognized hazards that can cause death or serious physical harm.

Incorporating Safety into the Design Process

- The effort was undertaken to de ne the project management process by which safety becomes an integral part of the design process and document that process in a new DOE technical standard, DOE Standard 1189, *Integration of Safety into the Design Process.* This standard will address the hazard prevention and mitigation process in the design of DOE hazard category 1, 2, and 3 nuclear facilities and will address both radiological and chemical hazards.

DOE Differing Professional Opinion Policy and Manual

- In November 2006, the Department issued DOE Policy 442.1, *Differing Professional Opinions on Technical Issues Related to Environment, Safety, and Health*, and DOE Manual 442.1-1, *Differing Professional Opinions Manual for Technical Issues Involving Environment, Safety and Health*. These directives provide a policy and a process for encouraging dialogue and resolution on differing professional opinions from employees (both Federal and contractor) for technical issues involving environment, safety, and health at DOE facilities.

Other Board Interface Activities

- The Department provided 27 responses to reporting requirements from the Board during 2006.

- The Department issued 21 new or revised safety directives in 2006, each of which was reviewed by the Board's staff prior to issuance. In addition, another 31 draft safety directives received Board staff review and are being finalized prior to issuance.

- The Department exchanged 132 pieces of correspondence with the Board during 2006.

- The Department hosted 144 site visits by Board members or Board staff members during 2006.

Summary of the Department's Major Safety Accomplishments

Accomplishments over the past year that have contributed to improved safety at Department facilities include:

- The Of ce of Environmental Management has completed environmental activities at ve sites: RFETS, FEMP, CEMP, Kansas City Plant, and LLNL.

- On November 21, 2006, the Board agreed with DOE's closure of Recommendation 95-2, *Safety Management.*

- On August 30, 2006, the Secretary created the Of ce of Health, Safety and Security to provide corporate-level leadership and strategic vision necessary to better coordinate and integrate health, safety, environment, security, enforcement, and independent oversight programs in the Department.

- The Of ce of the CNS was established in January 2006 to strengthen line management oversight of nuclear facilities.

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V. Other Board Interface Activities

Appendices

Figures and Tables

I. Introduction

Pursuant to Section 316(b) of the Atomic Energy Act of 1954, as amended (codified at 42 U.S.C § 2286e (b), the U.S. Department of Energy (DOE) submits this Annual Report to Congress, which describes the Department's activities for 2006 pertaining to the Defense Nuclear Facilities Safety Board. This report details the Department's key safety initiatives, implementation of Board recommendations, implementation of integrated safety management (ISM), and other Board interface activities.

A. Background

The Board is an independent executive-branch agency established by Congress in 1988 to provide advice and recommendations to the Secretary regarding public health and safety issues at the Department's defense nuclear facilities. The Board reviews and evaluates the content and implementation of health and safety standards and other requirements relating to the design, construction, operation, and decommissioning of the Department's defense nuclear facilities. Figure 1.A provides the locations of the major Department facilities involved in defense nuclear activities across the United States.

The Board communicates with the Department through a variety of mechanisms, including formal recommendations, formal reporting requirements, letters requesting action and information, letters providing suggestions, letters providing information such as staff issue reports and trip reports, and requests from the Board and the Board's staff for information. In addition, the Board communicates with the Department through public meetings, briefings and discussions, and site visits.

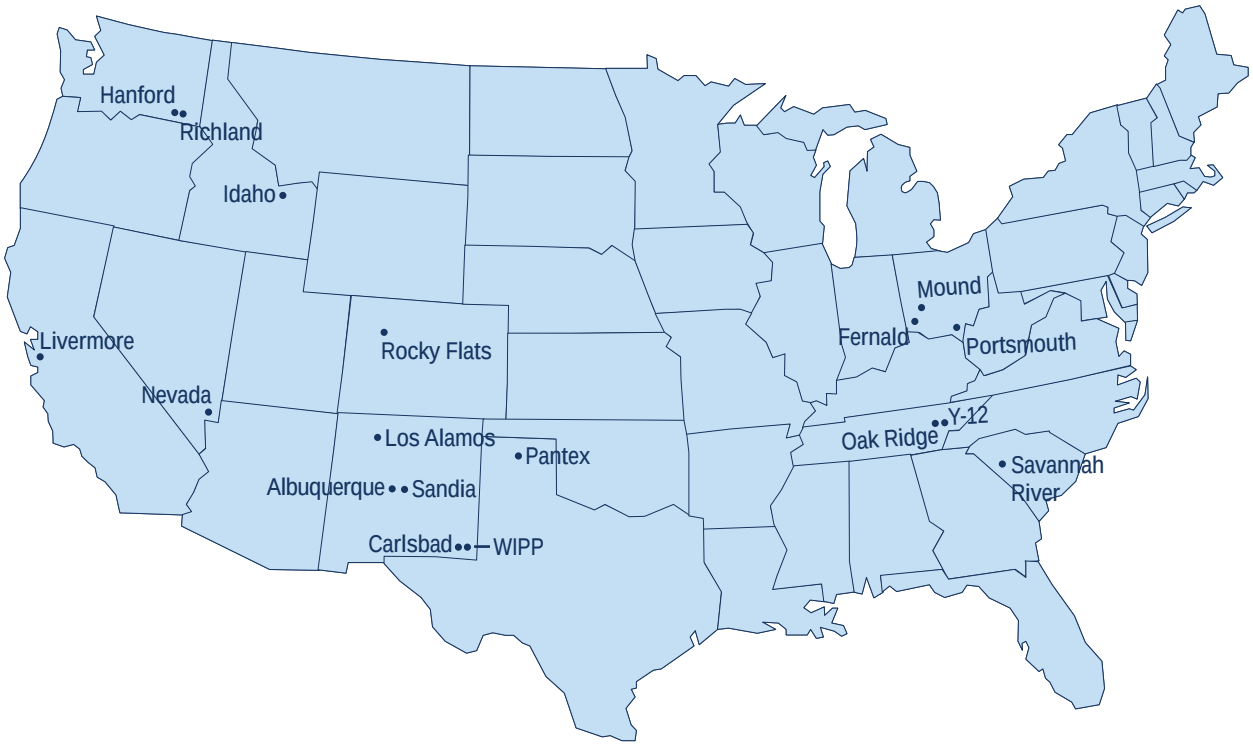


Figure 1.A - Location of Major Department Facilities

B. Overview of the Department's Policy for Interfacing with the Board

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

- Fully cooperate with the Board
- Provide access to information necessary for the Board to accomplish its responsibilities
- Thoroughly consider the recommendations and other safety information provided by the Board
- Consistently meet commitments to the Board
- Conduct interactions with the Board in accordance with the highest professional standards.

C. Overview of the Department's 2006 Activities Pertaining to Board Recommendations

Board recommendations are the most formal and most powerful mechanism the Board uses to prompt action by the Department. As of January 2007, there are 13 open Board recommendations. Seven of the associated implementation plans are either complete or no longer active—the Department has completed all implementation plan milestones for six of these implementation plans, and transferred all remaining open milestones for the seventh plan to another plan (in the case of Board Recommendation 94-1, *Improved Schedule for Remediation*). Additionally, the Secretary has proposed closure of 4 of the 13 open recommendations (as noted by an "*" in the list below).

In 2006, the Board issued no new recommendations to the Secretary.

The data in Table 1.A reflect the evolution of the recommendation process. Initially, Board recommendations addressed specific, highly technical, significant safety issues within the Department's activities. Over time, the Department has addressed these risks and established integrated programs to improve the Department's overall safety management process. The Department's success in these areas, combined with the Board's increased use of letters and other notification methods, has led to the issuance of fewer, but often broader recommendations in recent years.

Figure 1.B shows the new Board recommendations for each year.

Figure 1.C provides the net open Board recommendations at year end from 1990 to 2006.

Figure 1.D shows the number of recommendations closed by the Board each year from 1990 to 2006.

Table 1.B provides key dates for open Board recommendations.

Table 1.C summarizes the status of Board recommendations. The Board agreed with DOE's closure of Recommendation 95-2, *Integrated Safety Management*, on November 21, 2006.

Completed or Inactive Implementation Plans

- 2000-2, *Configuration Management, Vital Safety Systems*
- 98-1, *Resolution of Oversight Findings* *
- 97-1, *Safe Storage of Uranium-233*
- 95-2, *Safety Management*
- 94-1, *Improved Schedule for Remediation* (incorporates Recommendation 2000-1) *
- 92-4, *Multi-Function Waste Tank Facility at Hanford* *

* Secretary has proposed closure.

Table 1.A – Historical Trend of Open Board Recommendations

Year	Recs Issued	Recs Closed	Net Change in Open Recs for the Year	Open Recs at Year End
1990	7	0	+7	7
1991	6	0	+6	13
1992	7	8	-1	12
1993	6	1	+5	17
1994	5	1	+4	21
1995	2	6	-4	17
1996	1	4	-3	14
1997	2	1	+1	15
1998	2	0	+2	17
1999	1	9	-8	9
2000	2	0	+2	11
2001	1	0	+1	12
2002	3	1	+2	14
2003	0	1	-1	13
2004	2	0	+2	15
2005	1	2	-1	14
2006	0	1	-1	13

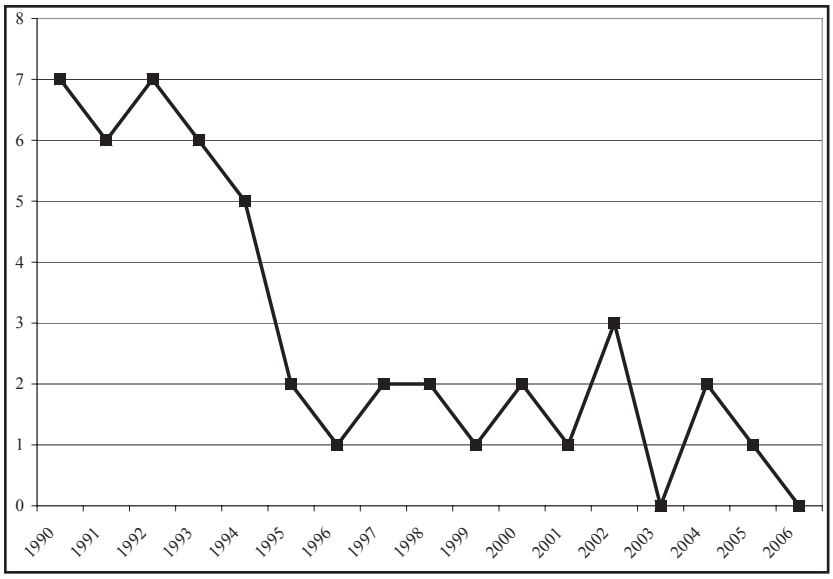


Figure 1.B - New Board Recommendations (1990 - 2006)

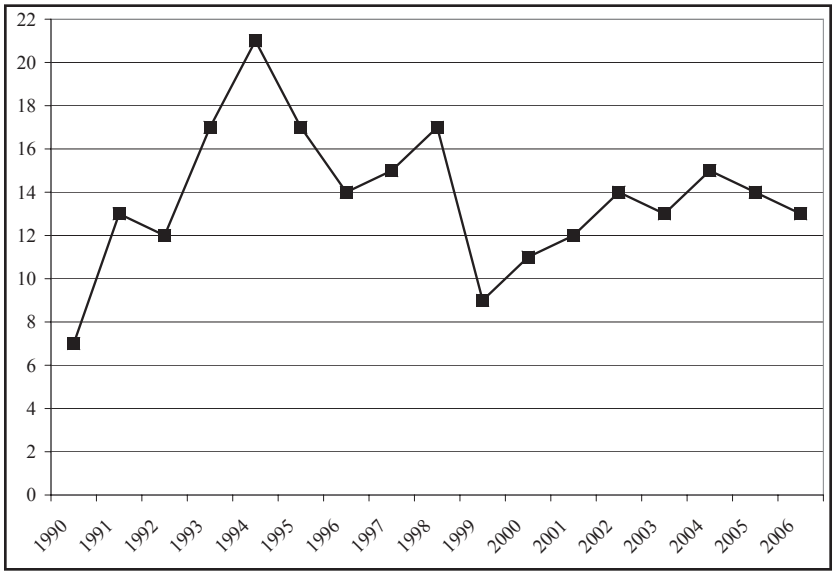


Figure 1.C - Net Open Board Recommendations at Year End (1990 - 2006)

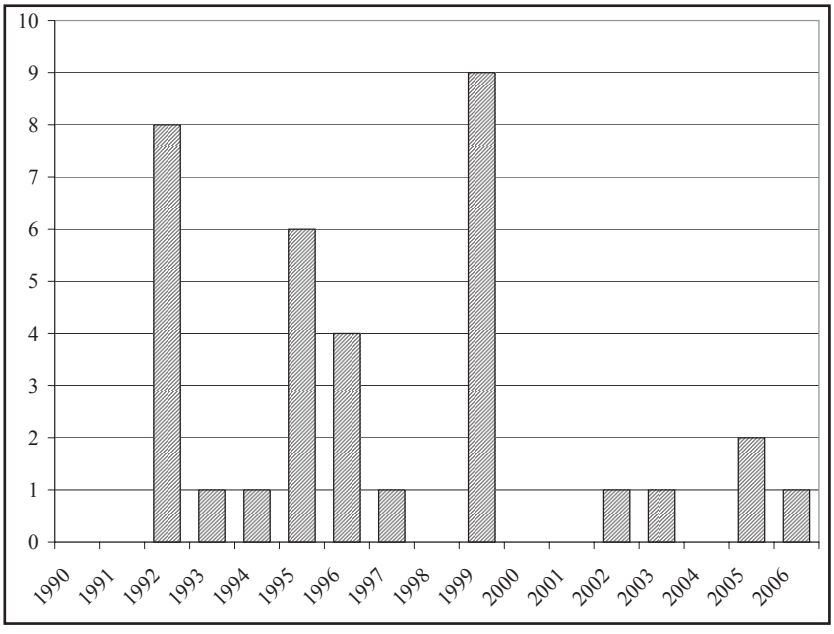


Figure 1.D - Recommendation Closures Per Year (1990 - 2006)

Table 1.B – Key Dates for Open Board Recommendations

Section 315(b) of the Atomic Energy Act of 1954 requires the Secretary to accept or reject, in whole or in part, each Board recommendation within 45 days of its publication, unless an additional 45 days is requested and granted. Section 315(e) of the Atomic Energy Act of 1954 requires the Secretary to provide an implementation plan for each accepted recommendation within 90 days of publication of the acceptance, unless an additional 45 days is needed and the Board is notified.

Rec	Subject	Rec Date	Response Date	Implementation Plan Date
92-4	Multi-Function Waste Tank Facility at Hanford	7/6/92	8/28/92	10/8/97 (Rev. 2)
94-1	Improved Schedule for Remediation	5/26/94	8/31/94	6/8/00 (Rev. 3)
97-1	Safe Storage of Uranium-233	3/3/97	4/25/97	9/29/97
98-1	Resolution of Safety Issues Identified by Internal Independent Oversight	9/28/98	11/20/98	3/10/99
98-2	Safety Management at Pantex	9/30/98	11/20/98	10/28/02 (Rev. 1 changes)
2000-1	Stabilization and Storage of Nuclear Material	1/14/00	3/13/00	7/22/02 (Rev. 2) 5/3/04 (RL) 7/23/04 (LANL)
2000-2	Configuration Management, Vital Safety Systems	3/8/00	4/28/00	10/31/00
2001-1	High-Level Waste Management at the Savannah River Site	3/23/01	5/18/01	7/11/06 (Rev. 4)
2002-1	Quality Assurance for Safety-Related Software	9/23/02	11/21/02	3/13/03
2002-3	Design, Implementation, and Maintenance of Administrative Controls	12/11/02	1/31/03	6/26/03
2004-1	Oversight of Complex, High-Hazard Nuclear Operations	5/21/04	7/21/04	10/12/06 (Rev. 2)
2004-2	Active Confinement Systems	12/7/04	3/18/05	7/12/06 (Rev. 1)
2005-1	Nuclear Material Packaging	3/10/05	5/6/05	8/17/05

Table 1.C – Summary Status of Board Recommendations

REC	SUBJECT	OPEN	CLOSED
90-1	Savannah River Operator Training		10/27/1992
90-2	Codes and Standards		10/24/1995
90-3	Hanford Waste Tanks		05/01/1992
90-4	Rocky Flats Operational Readiness Reviews		02/16/1995
90-5	Rocky Flats Systematic Evaluation Program		10/24/1995
90-6	Rocky Flats Plutonium in the Ventilation Ducts		10/24/1995
90-7	Hanford Waste Tanks		09/04/1996
91-1	Safety Standards Program		10/27/1992
91-2	Reactor Operations Management Plan		10/27/1992
91-3	Waste Isolation Pilot Plant		10/27/1992
91-4	Rocky Flats Building 559 Operational Readiness Review		05/01/1992
91-5	Savannah River K Reactor Power Limits		04/07/1993
91-6	Radiation Protection		11/08/1996
92-1	Operational Readiness of the HB-Line at Savannah River		10/27/1992
92-2	Facility Representatives		09/17/1996
92-3	HB-Line Operational Readiness Reviews		02/03/1993
92-4	Multi-Function Waste Tank Facility at Hanford	X[1]	
92-5	Discipline of Operations During Changes		10/24/1995
92-6	Operational Readiness Reviews		10/24/1995
92-7	Training and Qualification		11/05/1993
93-1	Standards Utilization in Defense Nuclear Facilities		03/25/1999
93-2	The Need for Critical Experiments Capability		12/31/1997
93-3	Improving Technical Capability in Defense Nuclear Programs		11/09/1999
93-4	Environmental Restoration Management Contracts		06/28/1996
93-5	Hanford Waste Tanks Characterization Studies		11/15/1999
93-6	Maintaining Access to Nuclear Weapons Expertise		04/27/1999

Table 1.C – Summary Status of Board Recommendations (continued)

REC	SUBJECT	OPEN	CLOSED
94-1	Improved Schedule for Remediation	X[2]	
94-2	Safety Standards for Low-Level Waste		12/22/1999
94-3	Rocky Flats Seismic and Systems Safety		05/27/1999
94-4	Deficiencies in Criticality Safety at Oak Ridge, Y-12		03/12/1999
94-5	Integration of Rules, Orders, and Other Requirements		06/10/1999
95-1	Improved Safety of Cylinders Containing Depleted Uranium		12/16/1999
95-2	Safety Management		11/21/2006
96-1	In-Tank Precipitation System at Savannah River		03/29/2002
97-1	Safe Storage of Uranium-233	X	
97-2	Continuation of Criticality Safety		08/07/2003
98-1	Resolution of Safety Issues Identified by DOE Internal Oversight	X[3]	
98-2	Safety Management at the Pantex Plant	X	
99-1	Safe Storage of Pits		09/09/2005
2000-1	Prioritization for Stabilizing Nuclear Materials	X	
2000-2	Configuration Management, Vital Safety Systems	X[4]	
2001-1	High-Level Waste Management at the Savannah River Site	X	
2002-1	Quality Assurance for Safety-Related Software	X	
2002-2	Weapons Laboratory Support of the Defense Nuclear Complex		11/22/2005
2002-3	Requirements for the Design, Implementation, and Maintenance of Administrative Controls	X	
2004-1	Oversight of Complex, High-Hazard Nuclear Operations	X	
2004-2	Active Confinement Systems	X	
2005-1	Nuclear Material Packaging	X	

1. Secretary proposed closure on December 16, 1998.
2. Secretary proposed closure on June 8, 2000.
3. Secretary proposed closure on November 13, 2001.
4. Secretary proposed closure on May 26, 2006.

D. Report Preview

The remaining portions of the annual report are described below:

- Section II, KEY DEPARTMENT SAFETY INITIATIVES, describes broad-based Departmental activities that affect environment, safety and health.

- Section III, IMPLEMENTATION OF BOARD RECOMMENDATIONS, describes Departmental activities completed in 2006 to implement Board recommendations accepted by the Secretary.

- Section IV, SAFETY ACCOMPLISHMENTS AND ACTIVITIES AT MAJOR DEFENSE NUCLEAR SITES, describes Departmental activities at sites and field offices pertaining to safety and safety management.

- Section V, OTHER BOARD INTERFACE ACTIVITIES, describes Departmental activities to maintain communications and improve interaction between the Department and the Board.

II. Key Department Safety Initiatives

This section describes key initiatives that the Department is implementing to improve performance in ensuring public health and safety.

A. Creation of the Office of Health, Safety and Security

Creation of the new Office of Health, Safety and Security integrates Department worker health, safety, environment, and security functions and creates an organizational structure better suited to address cross-cutting issues, increase collaboration and sharing of technical expertise, decrease stove-piping, and increase accountability for worker health, safety, and security responsibilities. The integrated approach and functional alignment of responsibilities in the new office will prevent overlap in reporting, policy and guidance development, and technical assistance responsibilities while increasing the effectiveness of communication and accountability for worker health, safety, and security at DOE. Worker health, safety, and security are the Department's most significant cross-cutting activities with a common purpose to protect workers and the public from hazards associated with Departmental sites and operations. Some key objectives of the new office include the following:

- **Improve the quality and timeliness of environment, safety, and health policy and directives:** Current environment, safety, and health policy elements will be integrated to provide better guidance regarding health and safety across the complex. Coordination with program offices, the field, and other stakeholders will be strengthened in order to obtain and evaluate input in the early stages of policy development. Additionally, the results of health studies and surveillances will be better utilized in developing policy and improving worker protection.

- **Enhance worker health and safety:** The new office will combine various experiences, including safety disciplines, and focus on making worker health and safety improvements and implementing the related rule (10 CFR 851). For example, based on independent oversight assessment results and program office and field input, the new office will work with line managers to provide greater assurance that management systems adequately identify and analyze hazards and provide appropriate controls to protect the health and safety of workers. The new office also will provide technical assistance to integrate safety and security design considerations early in the construction process. Another focus will be to perform better health and safety data analysis to more effectively drive improvements or respond to adverse trends and provide a foundation to implement Department-wide solutions.

- **Enhance Federal expertise and training:** Raising the skill level of environment, safety, and health line management oversight personnel is a recognized need. The new office will ensure that the Department's technical personnel work with the National Training Center to improve and maintain Federal expertise, particularly as applied to line management oversight.

- **Improve issues management:** The issues management program encompasses corrective action management, issue tracking and monitoring, and lessons-learned dissemination and application. Improvements in issues management represent one of DOE's greatest opportunities to enhance health and safety programs across the Department. The program has the potential to reduce the number of accidents and events at Department sites and ensure that management expectations for new requirements and initiatives are effectively

communicated, understood, implemented, and verified to meet expectations. The new office will address the current weaknesses in this program and place a high priority on changing the existing culture and promoting a work environment that values identification of safety issues by all employees and one where management is responsive in determining causes and ensuring effective issue resolution.

- **Implement an improved risk management approach:** The new office will work with line management toward an integrated risk management approach that better balances security risks with health and safety risks, and worker health, safety, and security risks against the importance of operational production mission.

B. Risk Reduction Through Stabilization of Excess Nuclear Materials and Waste

The mission of the Department's Office of Environmental Management (EM) program is safe risk reduction and cleanup of the environmental legacy of the nation's nuclear weapons program and government-sponsored nuclear energy research. The program is one of the largest and most diverse and technically complex environmental cleanup efforts in the world and includes responsibility for the cleanup of 114 sites across the country in 31 states. Included in that responsibility are three program objectives:

1. Ensure safety, which is the highest priority – no milestone or schedule is worth an employee safety incident, so EM must strive for zero accidents.

2. Attain and sustain 90 percent of EM's projects performing on cost and on schedule.

3. Develop a higher performing organization through an appropriate organizational structure, a career-oriented workforce, and personnel practices that enable us to develop and recognize performance excellence.

The challenges are to manage projects and operate facilities in a safe, secure, compliant, and cost-effective manner. Paramount to EM's success is safety—it is EM's top priority. The EM program manages some of the most inherently hazardous materials and is responsible for some of the nation's most crucial environmental actions. EM's focus continues to be on engineering and construction projects and cleanup projects. EM has applied project management to the entire environmental cleanup effort, not just capital asset projects. The projects undergo rigorous external independent reviews. All of EM's projects are now managed by qualified and certified Federal Project Directors, and safety is incorporated in the early stages of project planning and design development. EM now has the ability to normalize its safety performance and compare against industry performance.

The mission is challenging—the most visible example being the Waste Treatment and Immobilization Plant (WTP) at Hanford. The WTP project is arguably one of the largest, most complex construction projects in the nation and has encountered design and construction setbacks. The Department has remained committed to address these matters. The Department, along with the U.S. Army Corps of Engineers and our contractor, has undertaken several major activities to ensure the Department has a full understanding of what is required to complete construction and begin operations. This effort has led to a validated baseline for the project.

EM is making significant progress in three key areas:

- Nuclear materials disposition
- Radioactive waste disposal
- Facilities/sites cleanup and closure.

EM has also completed environmental activities at five sites: the Rocky Flats Environmental Technology Site (RFETS), the Fernald Environmental Management Project (FEMP), the Columbus Environmental Management Project (CEMP), the Kansas City Plant, and Lawrence Livermore National Laboratory (LLNL).

These accomplishments reflect significant cleanup and risk reduction. Some highlights include:

- Completed cleanup of RFETS and transferred to Legacy Management

- At Fernald, completed Silos 1 and 2 Project - 10,000 tons of radium-bearing residues extracted, stabilized, packaged, and shipped off site and completed Silo 3 Project – 5,000 tons of thorium-bearing waste removed, treated, packaged, and shipped off site

- At Savannah River, produced 246 cans of vitrified high-level waste (HLW) and disposed of 3,546 cubic meters of transuranic (TRU) waste

- At Hanford, achieved 29 percent construction completion and 78 percent design completion on the WTP

- At Oak Ridge, completed Melton Valley cleanup.

Within the cleanup program, real risk reduction occurs only when work is completed. Until waste has been permanently disposed of, risk must be managed and controlled. A summary of recent accomplishments is provided in Table 2.A (see pages II-4 and II-5).

C. NNSA Safety Accomplishments

Chief of Defense Nuclear Safety

On September 9, 2003, the National Nuclear Security Administration (NNSA) Administrator chartered a Task Force to review the Columbia Accident Investigation Board report and provide recommendations. One of the recommendations provided was for NNSA to establish a chief engineer position. The Board also cited the need for a Central Technical Authority (CTA) within the Department in its Recommendation 2004-1, *Oversight of Complex, High-Hazard Operations*. In response, the Department established two CTAs, one in NNSA and one in Energy, Science and Environment (ESE). The Principal Deputy Administrator was initially chosen as the CTA for NNSA. After the departure of the Principal Deputy Administrator, the NNSA Administrator became the CTA for NNSA. Subsequently, the position of Under Secretary for Science was created, and the new Under Secretary also became a CTA.

For NNSA, the Chief of Defense Nuclear Safety (CDNS) provides technical support to the CTA in the area of nuclear safety. In 2006, the CDNS developed, implemented, executed, and revised a number of processes and programs to support CTA responsibilities. These include processes for reviewing and concurring with exemption requests, for concurring with the nuclear safety requirements in NNSA contracts, for evaluating and concurring with delegations of nuclear safety authority, and for evaluating and concurring with proposed changes to the nuclear safety requirements in DOE directives. All of these processes were fully implemented and being executed by the end of 2006.

The CDNS also completed line management self-assessments for most of NNSA's site offices, continuing work that began in 2005. Assessments conducted in 2006 included the Livermore Site Office, the Sandia Site Office, and the Y-12 Site Office. These rigorous and thorough reviews provided senior leadership within NNSA, including the CTA, with increased operational awareness of the status of implementation of nuclear safety requirements within NNSA. As of the end of 2006, an initial assessment had been completed for all NNSA site offices with nuclear safety oversight responsibility, except for the Los Alamos Site Office.

In 2006, the CDNS also began a self-assessment of the CTA function within NNSA. This self-assessment, to be completed in early 2007, will support a declaration that NNSA has fully implemented the CTA function, as committed to in Board Recommendation 2004-1, *Oversight of Complex, High-Hazard Operations*.

Electrical Safety Improvements

In 2006, NNSA continued efforts to improve electrical safety practices and programs at sites to address recent occurrences and near-miss events involving work on electrical equipment. NNSA site offices are implementing a variety of improved practices to enhance safety during this type of work. In September 2006, the NNSA Administrator, the Deputy Administrator for Defense Programs, and the Senior Advisor for Environment, Safety and Health hosted a video conference with senior NNSA and contractor managers from the NNSA sites to share lessons learned on the improvements at each site that may be transferable to other sites. Over a dozen different, and in some cases new, activities were discussed and shared with each site. Included in these discussions were, for example, the expanded use of ground penetrating radar to detect energized circuits in the facility walls and the improved oversight practices by both Federal and contractor electrical safety subject matter experts.

Table 2.A - Summary of Environmental Management Accomplishments for 2006

EM Activities Across the Complex

- Completed cleanup of RFETS and transferred to Legacy Management.
- Completed Rocky Flats Site Closure Lessons Learned Report.
- Completing/transferring four other sites – Fernald Closure Project (Fernald), CEMP, LLNL – Main Site, Kansas City Plant.
- Disposed over 10,500 cubic meters of TRU waste at the WIPP; made over 1,125 shipments to WIPP.
- Disposed of over 6,000 cubic meters of low-level waste /mixed low-level waste from West Valley Demonstration Project (WVDP).

Fernald

- Completed Silos 1 and 2 Projects – 10,000 tons of radium-bearing residues extracted, stabilized, packaged, and shipped offsite.
- Completed Silo 3 Project – 5,000 tons of thorium-bearing waste removed, treated, packaged, and shipped offsite.
- Completed final waste placement in the On-Site Disposal Facility.
- Restoring site to native ecosystem.

Hanford

- Completed construction of Integrated Disposal Facility.
- Demolished 232-Z Incinerator Building.
- Completed shipment of 644 containers from the Plutonium Finishing Plant Complex.
- Continued progress on structure demolition, field remediation, and waste disposal.
- Achieved 29% construction complete and 78% design complete on WTP.
- Continued progress on tank retrieval and closure activities.
- Improving the safety culture and safety record.

Human Capital

- Completed a complex-wide skills gap analysis and human capital strategy.
- Held Nuclear Executive Leadership Program course.
- Completed certification of all Line Item Federal Project Directors; 34 certified in 2006.
- Started Corporate Career Development Program.

Idaho

- Continued progress on spent nuclear fuel transfer from wet to dry storage.
- Starting shipping mixed low-level waste offsite.
- Completed decontamination and decommissioning of nine buildings, one nuclear facility, and forty other nuclear and radioactive structures.
- Continuing remediation of contaminated environmental sites.
- Received International Organization for Standardization 9001:2000 certification.

Table 2.A - Summary of Environmental Management Accomplishments for 2006 (continued)

Management and Compliance

- Established process for preparation and review of Section 3116 Waste Determinations.
- Achieved regulatory approval and operational readiness to initiate offsite mixed low-level waste disposal at the Nevada Test Site (NTS).
- Improved project management and the implementation of DOE Order 413.3, *Program and Project Management for the Acquisition of Capital Assets*.
- Increased "green" projects across the complex.
- Institutionalized external technical reviews.

Oak Ridge

- Completed Melton Valley cleanup.
- Continued progress at East Tennessee Technology Park (ETTP) and the balance of reservation.

Portsmouth/Paducah

- Completed Section 1 of the North/South diversion ditch at Paducah.
- Disposed of 23,900 tons of scrap metal at Paducah.
- Received balance cylinders from the ETTP at Paducah.
- Completed construction of administration and warehouse buildings at the Deleted Hexafluoride Conversion Facilities.

Safety, Acquisition, and Technology

- Improved our overall safety record.
- Established a comprehensive EM headquarters safety and oversight program.
- Improved the transportation program's focus on safety and risk reduction.
- Continued to grow our engineering and technology capabilities.
- Made major strides in improving the acquisition process.

Savannah River

- Produced 246 cans of vitrified HLW.
- Disposed 615 cubic meters of TRU waste. (Cumulatively 3,546 cubic meters.)
- Completed deactivation of the F Area complex.
- Completed decontamination and decommissioning of 63 facilities.
- Completed decontamination and decommissioning of 247-F complex.
- Completed remediation of nine environmental sites.

NNSA has taken the following actions in conjunction with the Energy Facility Contractors Group (EFCOG) and other Department organizations:

- Participating in developing and implementing the Electrical Safety Improvement Project Plan that was approved in early 2006
- Conducting the second Electrical Safety Workshop in 2006, which was coordinated with EFCOG and the Office of Health, Safety and Security; the third workshop is planned for July 2007
- Coordinating with the National Training Center to provide enhanced electrical safety training for Federal and contractor employees, including the use of a mobile unit that visits sites to provide hands-on training
- Fully integrating the electrical safety function into plans developed under the new rule, 10 CFR 851, *Worker Safety and Health Program*
- Issuing direction for NNSA sites to develop electrical safety improvement plans that address the Special Operations Report 2006-1
- Leading a working group in the development of the Electrical Safety Assessment document to assist in conducting electrical safety assessment of facilities and operations.

Future Leaders Program

The objective of the NNSA Future Leaders Program (FLP) is to develop technically competent professionals to eventually manage programs and projects within NNSA, including managing energy-related and national defense weapons-related programs at both nuclear and non-nuclear facilities. The NNSA Administrator began the FLP in 2004 with the goal of providing a systematic intake of highly-motivated, competent college graduates into the NNSA workforce. The first set of 29 FLP participants started their NNSA careers in July 2005. A second class of 30 FLP participants began their careers in June 2006. Hiring is ongoing for the third class of 26 FLP participants, who will begin their careers in 2007.

The recruitment strategy for the FLP is to recruit on campus for graduates who have received either bachelors or masters degrees within two years of starting with NNSA. To prepare for the recruiting activities, a needs assessment of all the different NNSA organizations is conducted. The FLP office works with the managers of the various NNSA organizations to identify needs and the college campuses where recruitment takes place. Colleges are selected for their outstanding degree programs and geographic proximity to the duty stations of the positions to be filled, as well as the campuses' diversity index. For example, to fill the 29 initial slots in the FLP class that started in July 2005, a total of 14 campuses were visited in the spring of 2005. *U.S. News and World Report* recognized 7 of these 14 universities for their outstanding engineering schools. Three Historically Black Colleges and Universities and two Hispanic Associated Colleges and Universities were also visited. During the second year of the program, 12 campuses of equally high caliber were visited, and in the third year 11 were visited.

Once NNSA's needs are established and campuses are identified, the FLP office, supported by the NNSA Service Center Human Resources Department, assembles several recruitment teams. Each team is typically composed of a human resources consultant, one or more selecting officials from the office(s) at which the FLP participants would be placed, and a diversity representative.

An extensive two-year training curriculum for the FLP candidates has been developed, combining formal training courses, mentoring, and at least two rotational assignments. After an initial two-week orientation session, participants in technical positions complete a general technical base course and other essential technical courses, such as conduct of operations, operational readiness reviews, and principles for a strong nuclear safety culture. They also complete general courses, such as project management, budget, contracting, and leadership. During the two-year curriculum, each participant completes at least one 30-day and one 60-day rotational assignment in a field related to his/her ultimate assignment.

Early indicators reveal a high level of program satisfaction from the FLP participants and managers in participating offices.

NNSA's Road Map for Nuclear Facility Quality Assurance Excellence, NNSA's Planning Basis for Effective Quality Assurance at NNSA Facilities

In 2006, work continued on completing actions described in the NNSA Road Map for Nuclear Facility Quality Assurance (QA) Excellence, which was approved by the NNSA Management Council in April 2005. The Road Map calls for a series of actions to improve the effectiveness of QA at NNSA facilities.

The Road Map builds from, replaces, and enhances the prior approach for NNSA actions, as described in the Department's QA improvement plan provided to the Board in November 2002. The Road Map fully supports and extends NNSA commitments in the Department's implementation plans in response to Board Recommendations 2002-1, *Quality Assurance for Safety-Related Software*, and 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*. There are 16 mile markers covering actions in the areas of people, programs, and processes. In August 2006, the Road Map was updated to reflect the status of ongoing and completed actions and to add new actions where appropriate.

Some of the recent accomplishments of the Road Map include completion of all NNSA commitments in the implementation plan for Board Recommendation 2002-1, *Quality Assurance for Safety-Related Software*; development of the NNSA Safety Software Quality Handbook, Part II; and peer reviews of implementation of sitewide integrated issues management systems, a graded approach for QA, flowdown of QA requirements, and safety software institutionalization.

In July 2006, the NNSA Administrator approved the NNSA Headquarters quality assurance program (QAP) plan. The QAP plan describes the NNSA processes for integrating a strong attention and commitment to quality into the daily work of NNSA Headquarters and maintaining an essential healthy safety culture. It describes process/activity management and control and how these elements play a major role in meeting DOE and NNSA objectives.

It is the objective of DOE, including NNSA, to simultaneously satisfy the requirements of QA and safety management policy. DOE Policy 450.4, *Safety Management System Policy*; DOE Acquisition Regulation (DEAR) 48 CFR 970.5204-2 (i.e., the DEAR ISM system clause); and DOE Manual 450.4-1, *Integrated Safety Management System Manual*, issued in November 2006, call for complementary and integrated safety and quality management systems. These systems share many of the same concepts, goals, and implementing processes. NNSA is continuing to coordinate its activities so that at all management levels, quality and safety requirements are implemented through a common management systems approach.

D. Facility Representative Program Activities

Facility Representatives are highly trained Department employees who provide effective day-to-day oversight of contractor operations at the Department's most hazardous facilities. Approximately 200 Facility Representatives around the complex provide oversight of operational activities important to mission accomplishment and worker and public safety. The Department's standard, DOE-STD-1063-2006, *Facility Representatives*, defines the duties, responsibilities, and qualifications for Department Facility Representatives. The Facility Representative program supports Department managers in ensuring that Facility Representatives are competent and technically qualified to perform their jobs.

Key components of the program include:

Complex-wide performance indicator reports provided to the Department's senior managers every quarter since 1999 for evaluation and feedback to improve the program

Designated Facility Representative Steering Committee members and sponsors at each field and major Headquarters program office to serve as management advocates for Facility Representatives

Monthly conference calls of the Facility Representative Steering Committee to discuss program development and operational oversight issues

Annual Facility Representatives Workshop to promote the sharing of lessons learned from Facility Representative programs across the complex

Facility Representative web site <https://www.hss.doe.gov/deprep/facrep> to provide information on the

Facility Representative program, qualification standards, vacancy announcements, and other useful information for the Department's Facility Representatives.

Facility Representative of the Year

The Facility Representative of the Year award is provided annually to a Facility Representative who consistently demonstrates exceptional performance and who makes significant contributions to the safe and efficient operation of Department facilities. A total of 12 Facility Representatives were nominated for the Facility Representative of the Year Award by their field offices. A panel of senior field and Headquarters personnel selects the overall Department winner of the award from the field nominees. The 12 nominees from field offices demonstrated continued strong management support for the program and exceptional performance. This year, the award was presented to a Facility Representative from the Idaho Operations Office. His accomplishments are described as part of the Annual Workshop discussion, below.

2005 Facility Representative of the Year Award Winner, Dary Newbry and his wife with Secretary Bodman

Annual Workshop

The 2006 Annual Facility Representatives Workshop was held in Knoxville, Tennessee, May 16-19, 2006. A total of 127 people attended, representing every major program and field office. Included in the total were 55 Facility Representatives, representing one-quarter of the Department's Facility Representative community. Dr. Ines Triay, Chief Operating Officer for EM, gave the keynote address. The theme of the address was *Safety Oversight at Environmental Management Activities*. Joseph F. Bader, a member of the Defense Nuclear Facilities Safety Board, provided remarks on the need to appropriately apply the operationally-oriented perspective of DOE Facility Representatives in the oversight of nuclear facility construction. Finally, Dr. Manuel Gomez of the U.S. Chemical Safety and Hazard Investigation Board provided an enlightening presentation on facility safety. Dr. Gomez summarized several recent investigations by his agency and the root causes of several accidents, including the ongoing investigation of the March 23, 2005, explosions at the British Petroleum refinery in Texas City, Texas. The accident at British Petroleum killed 15 workers and injured about 180 others when flammable liquid and vapor overfilled a blowdown drum during the startup of the refinery's isomerization unit. Many of the lessons learned were applicable to DOE facilities.

Also at the workshop, the Department-wide 2005 Facility Representative of the Year Award was presented to an employee of the Idaho Operations Office. Some of his noteworthy accomplishments included challenging the adequacy of the contractor's review and analysis of a plutonium uptake event and identifying potential causes and problems not recognized by the contractor. He also oversaw assembly, testing, and readiness reviews of the facility for the plutonium 238-powered radioisotope thermoelectric generator to provide electrical power for the National Aeronautics and Space Administration's New Horizons spacecraft during its mission to explore Pluto and its moons.

Continuous Improvement

The Department continued with its efforts to improve the Facility Representative program. As a result, DOE-STD-1063-2006, *Facility Representatives,* was revised and updated to address a more rigorous staffing analysis methodology. The revision provides a technical approach for determining the appropriate amount of Facility Representative oversight necessary for a facility, given its hazard level, operational activity and complexity, and programmatic importance.

In August 2006, a self-assessment of the Savannah River Operations Office (SR) Facility Representative program was performed. A sound Facility Representative program is mandated by DOE Manual 426.1-1A, *Federal Technical Capability Manual*, Section II, *Facility Representatives*, which states, "Field elements with hazardous facilities must establish a formal Facility Representative Program."

Field element managers are required in DOE-STD-1063-2006 (updated as of April 2006) to periodically (at least every three years) evaluate their Facility Representative programs relative to the standard.

In its July 13, 2004, letter to the Board, NNSA also committed to developing an NNSA corporate pipeline, of which Facility Representatives would be a major part, to ensure that talented candidates are ready to fill expected vacancies at NNSA sites. In 2005, NNSA commenced its FLP to fulfill this commitment. The two-year program involves a combination of work situations at multiple NNSA locations and contractor organizations, an aggressive internal training program, and mentoring with experienced individuals. A total of 29 initial candidates joined the FLP, of which 10 are Facility Representative candidates. The 2005 class is expected to graduate in July 2007.

Conclusion

Oversight performed by Facility Representatives provides Department line managers with real-time, accurate, and objective information on the effectiveness of contractor work performance and practices, including implementation of ISM. The Department's experience has shown that when personnel are dedicated to this function, the information that they provide can be used proactively to ensure that work is completed in a safe and environmentally responsible manner. Further, Facility Representatives have obtained a strong understanding of the technical nuclear and hazardous operations needed to successfully perform in positions of increased responsibility throughout the Department.

E. Office of Independent Oversight

On August 30, 2006, the Secretary created the Office of Health, Safety and Security to provide corporate-level leadership and strategic vision necessary to better coordinate and integrate health, safety, environment, security, enforcement, and independent oversight programs at the DOE. Within the new structure, the Office of Independent Oversight provides independent assessment of the effectiveness of policies and programs in safeguards and security; cyber security; emergency management; environment, safety and health; and other critical functions of immediate interest to the Secretary, the Deputy Secretary, and Administrator of NNSA. The Office of Independent Oversight reports to the Chief Health, Safety and Security Officer, who reports directly to the Deputy Secretary.

During 2006, Independent Oversight's Office of Environment, Safety and Health Evaluations conducted three inspections of defense nuclear sites. Findings from these inspections were entered into the corrective action system in accordance with the Department's response to Board Recommendation 98-1, *Resolution of Safety Issues Identified by Internal Independent Oversight.*

Status Reports

During 2004, the Office of Environment, Safety and Health Evaluations adopted a new approach towards development of complex-wide status reports. Annually, based on previous DOE-wide assessment results and operational data, the Office identifies a number of focus areas that warrant increased management attention. During the planning phase of each inspection, the Office selects applicable focus areas for review based on the site mission, activities, and past environment, safety, and health performance. In addition to providing feedback to the inspected site, the Office of Environment, Safety and Health Evaluations uses the results of the review of the focus areas to gain a DOE-wide perspective on the effectiveness of DOE policy and programs. Such information is periodically analyzed and disseminated to the Department's CTAs and to appropriate DOE program offices, sites, and policy organizations.

In 2006, the Office of Environment, Safety and Health Evaluations identified several focus areas of generally acknowledged weaknesses and/or areas needing review of status implementation across the Department, including the workplace monitoring of non-radiological hazards, safety system component procurement, environmental management system and pollution prevention program, and implementation of DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*. The Office of Environment, Safety and Health Evaluations is planning to publish separate reports on the status of issues related to these focus areas during the next year. Reports covering several of the 2005 selected focus areas, including the chronic beryllium disease program, the nuclear facility safety system engineer and oversight programs, and essential system functionality, were published during 2006.

Emphasis Areas

The Office of Environment, Safety and Health Evaluations continued to emphasize several key ISM areas. The first area of emphasis was implementation of controls to protect workers, the public, and the environment during work activities. The second area was maintaining the functionality of safety systems at hazardous facilities to protect workers, the public, and the environment; the emphasis in this area is consistent with the Department's implementation plan for Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems*. The third area was feedback and improvement, including the Department's line management oversight of contractors, Department and contractor self-assessments, and, in particular, corrective action management. The emphasis in this area is consistent with the Department's implementation plan for Board Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations.*

F. Quality Assurance Activities

The Office of Health, Safety and Security serves as the Department's corporate focal point for QA programs, processes, and procedures. The Office is also responsible for identifying and resolving Departmental cross-cutting QA issues and supporting line management implementation of policy and requirements for the design, procurement, fabrication, construction, and operation of Department facilities.

The Office, along with EM and NNSA, periodically briefs the Board on QA and software quality assurance (SQA)-related issues and initiatives. In 2006, the Office combined what were previously two separate briefings for QA and SQA into one QA briefing. The Department will continue to brief the Board on QA and SQA.

DOE Order 414.1C, *Quality Assurance*

In an effort to gather further information to be able to evaluate the Department's status on QA, the Secretary, in his memorandum of April 26, 2006, requested all Departmental elements to report on their implementation of DOE Order 414.1C, *Quality Assurance*.

The Secretary expressed concern about the findings of various external stakeholders, namely the Government Accountability Office and the Department's Inspector General, concerning what was reported as inconsistent implementation of QA policies and principles.

Reporting guidance was developed and Departmental elements were requested to report their progress in developing and implementing QA programs. Ninety percent of the Headquarters offices that were queried responded.

The survey results indicated that a number of Headquarters offices do not have a written QA plan in place but are in the process of developing one as required by DOE Order 414.1C, *Quality Assurance*. Most field offices reported that they and their contractors have a QA plan in place, although some may not be in compliance with this revision of the order. Those that reported they were not in compliance reported that: 1) they are in the process of updating their QA plans pursuant to this Order; 2) they are governed by external agencies (e.g., Nuclear Regulatory Commission) applying other QA requirements; or 3) this Order is not applicable to their mission. In addition, most Headquarters offices and field offices reported they have designated a manager responsible for QA and have programs in place for assessment and continuous improvement.

This is the first step in assessing the implementation of the Department's QA program. Later in fiscal year (FY) 2007, more specific guidance to measure the effectiveness of QA implementation will be provided to Departmental elements. This will support annual reporting as required by DOE Order 414.1C, *Quality Assurance*.

Occurrence Reporting and Processing System

The Department has in place programs, such as the Occurrence Reporting and Processing System, that routinely collect operational information from the complex. In 2006, the DOE Office of Environment, Safety and Health, now the DOE Office of Health, Safety and Security, initiated an effort to better utilize these types of data to extract and trend QA-related information to identify possible areas of vulnerability pertaining to QA program implementation. The goal is, based on these types of analysis, to provide insight to the DOE program offices to increase their ability to monitor QA performance, and to focus DOE assessment resources on areas of most need and highest risk.

Safety Software Quality Assurance Program

The Department continues its efforts to establish a rigorous and effective safety SQA program through the implementation plan for Board Recommendation 2002-1, *Quality Assurance for Safety-Related Software*. The scope of the implementation plan includes safety software at the Department's defense nuclear facilities. Safety software includes safety system software, safety and hazard analysis and design software, and safety management and administrative controls software.

In 2005, significant progress was made when DOE Order 414.1C, *Quality Assurance*, was issued. This DOE directive and its associated guide, DOE Guide 414.1-4, *Safety Software Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE Order 414.1C, Quality Assurance,* established the roles, responsibilities, and authorities for all aspects of safety software; identified SQA requirements for safety software; and provided guidance for implementing those requirements. During 2006, the Department's SQA program was established at Headquarters and field locations. The Department conducted seven regional orientation sessions throughout 2005 and 2006 at key locations across the complex. These sessions were used to train DOE Federal and contractor staff on the new safety software requirements in DOE Order 414.1C, *Quality Assurance*. Implementation of this Order is proceeding, and effective implementation is closely related to the successful completion of commitments associated with the Department's implementation plan for Board Recommendation 2002-1, *Quality Assurance for Safety-Related Software*. Specific activities include the following:

- DOE continues to maintain qualified Federal personnel, both at Headquarters and at field elements, with SQA responsibilities through the Federal Technical Capability Program (FTCP) Safety SQA Functional Area Qualification Standard.

- DOE's safety software Central Registry was established in 2003 as part of the completion of the Department's implementation plan for Board Recommendation 2002-1, *Quality Assurance for Safety-Related Software*. At that time, the Registry included six safety analysis and design codes, referred to as "toolbox codes," that are commonly used across the Department. In 2006, an additional bioassay code, DOE-Expert Integrated Modules for Bioassay, was evaluated using criteria based upon DOE Order 414.1C, *Quality Assurance*, and DOE Guide 414.1-4 and was then placed into the safety software Central Registry. Two additional codes, Integrated Modules for Bioassay Professional Plus (a more extensive and broader application of the DOE's Expert version) and Hotspot, a radiation effects model associated with the short-term (less than 24 hours) atmospheric release of radioactive materials, were evaluated and are being processed for potential inclusion into the Central Registry in early 2007. DOE and the National Institute of Standards and Technology have entered into an interagency agreement to enhance the Consolidated Fire and Smoke Transport fire analysis code (one of the original six toolbox codes). Work began in 2006 to include a leak path factor capability in the code. Completion and release of the revised code with this capability is expected in 2007.

G. Federal Technical Capability Program

The DOE is committed to ensuring that employees are trained and technically capable of performing their duties. In pursuit of this objective, the FTCP was formed, recognizing that corporate leadership and line management ownership are essential to successfully implementing a program to recruit, develop, deploy, and retain technical capability at defense nuclear facilities. The FTCP consists of senior personnel designated as Agents to represent DOE Headquarters and field elements with defense nuclear facility responsibilities, including the NNSA. The FTCP reports to the Deputy Secretary and is responsible for overseeing the technical qualification program (TQP). The TQP includes the safety system oversight program, the Facility Representative program, the Senior Technical Safety Manager program, and other critical technical skills. The TQP also conducts periodic assessments of the effectiveness of the FTCP using internal and independent experts and provides recommendations to senior Department officials regarding DOE technical capability.

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

The Department's vision, as described in the implementation plan that responds to Board

Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*, is for its technical personnel to be recognized among all Federal agencies for the excellence of its Federal staff. The 2004-1 implementation plan outlines actions DOE will take to upgrade Federal technical capability. Calendar year 2006 saw the completion of Commitment 12 in the implementation plan, which calls for providing structured training, such as the Nuclear Executive Leadership Training, for safety professionals, senior managers and decision-makers responsible for nuclear safety, including those responsible for nuclear safety oversight, as well as issuance of the Technical Professional Career Development Program and implementation plan.

Commitment 13 of the 2004-1 implementation plan states that the FTCP will "develop corrective actions to improve recruiting, developing, training, qualifying, maintaining proficiency, and retaining technical personnel, as well as FTCP effectiveness." In response, the FTCP issued a corrective action plan in August 2005 that identified the following major actions:

1. Conduct a functional workforce analysis as a basis for meeting the needs of the organization's missions for the next five years.

2. Establish and implement a corporate accreditation process and plan based on the Institute of Nuclear Power Operations (INPO) model for the TQP. The FTCP Chair will oversee this process for the Deputy Secretary.

3. Reestablish the corporate Technical Leadership Development Program (Technical Leadership Development Program – technical intern program) and institutionalize it through commitments to funding and recruitment for classes on an annual basis.

4. Build on the Facility Representative program as a model for the Senior Technical Safety Manager qualification program and other functional area qualification programs.

5. Revise DOE Manual 426.1-1A, *Federal Technical Capability Manual*, to incorporate and institutionalize changes in Federal Technical Capability expectations developed as part of the Department's 2004-1 implementation plan.

In October 2006, Revision 2 of the 2004-1 implementation plan was issued. It directs the FTCP to:

- Make the accreditation process voluntary, rather than mandatory. Excellent organizations are expected to pursue accreditation and serve as model for others. Organizations voluntarily pursuing accreditation are expected to be more committed than those who would have had to pursue mandatory accreditation.

- Provide for a follow-on line management review of the effectiveness of the FTCP corrective action plan. The scope and approach for this review will be provided in the revision to the FTCP corrective action plan.

In December 2006, the FTCP prepared a revision to the corrective action plan that addresses both of these changes. At that time, 16 of the 28 actions from the original corrective action plan were completed. The revised corrective action plan includes 14 actions to be completed in 2007 and 2008.

A summary of the activities performed in 2006 for each of the five major actions follows.

Workforce Analysis

The Workforce Analysis for NNSA, EM, and Health, Safety and Security sites and Headquarters offices was updated. The list of key positions in NNSA, EM, and Health, Safety and Security was prioritized, and staffing plans detailing actions to be taken and due dates for completion were developed.

The Human Capital Management Plan was revised to incorporate the FTCP workforce analysis. Lessons learned from the previous Workforce Analysis were incorporated into the Workforce Analysis Guidance memorandum for the 2006 Workforce Analysis.

Accreditation Process

The interim TQP accreditation process was approved. A pilot accreditation process was performed successfully at the Y-12 site, after which a Lessons Learned Workshop was held and a revision to the accreditation process was developed. As identified above, the corrective action plan is being revised to make accreditation voluntary. Nine additional sites plan to pursue voluntary accreditation.

Technical Leadership Development Program

Interim guidance for the development of the corporate technical intern program, which includes lessons learned from review of prior intern programs, was issued. A budget request was submitted for institutionalizing the technical intern program in FY 2008.

Continued Enhancement of the Facility Representative Program

The Department continued its efforts to improve Facility Representative staffing and training. Details of these efforts are provided in Section II.D, *Facility Representative Program Activities*.

Federal Technical Capability Program Manual Update

To accommodate changes identified by the FTCP and other Board Recommendation 2004-1 activities, the FTCP will revise DOE Manual 426.1-1A, *Federal Technical Capability Manual*, within one year after necessary changes are identified to ensure that the expectations are institutionalized. This activity is included in the corrective action plan.

Technical Qualification

DOE maintained a fully qualified TQP rate in excess of 80 percent. At the end of FY 2006, the DOE qualification rate was 84 percent. Office participation in the TQP increased by 17 percent in the last year. Validation of the safety system oversight program was completed, and safety system oversight engineering assessments were performed at multiple sites. DOE qualification of safety system oversight personnel increased from 25 percent to 55 percent in the last year.

Functional Area Qualification Programs

The Senior Technical Safety Manager qualification standard was revised and issued. This new standard upgrades the qualification requirements in the areas of emergency preparedness, nuclear safety, radiological protection, and ISM system (ISMS) by including "working-level" versus "familiarity-demonstration" requirements.

A Senior Technical Safety Manager training course to prepare potential Senior Technical Safety Managers for qualification was developed, and the first training session was conducted.

Departmental champions for 12 other core science and engineering functional area qualification programs (e.g., electrical safety, nuclear safety, criticality safety, and fire protection) were identified. These functional area qualification programs will also upgrade the qualification expectations by identifying key working-level knowledge areas that will be required to be demonstrated. A schedule was established for upgrading these 12 functional area qualification program areas.

An FTCP face-to-face meeting was held in May in conjunction with the Facility Representative Workshop. A second face-to-face meeting was held on December 5, 2006, at which time the corrective action plan was updated.

H. Chief of Nuclear Safety

The Office of the Chief of Nuclear Safety (CNS) was established in January 2006 in response to Board Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*, and the results of the Space Shuttle orbiter Columbia accident investigation. The Department concluded that the Office of the CNS should be a small group of recognized experts with diverse technical education and experience who would provide operational awareness and technical nuclear safety advice to senior DOE line managers. The mission of the CNS and staff is to support the Under Secretary of Energy and the Under Secretary for Science in carrying out their functions as CTAs and to strengthen line management oversight of nuclear facilities.

After a nationwide search, a respected expert in the field of nuclear safety was chosen in January 2006 to be the CNS. In October 2006, the Under Secretary reported that the CTA for Energy completed Commitment 2 in the implementation plan for Board Recommendation 2004-1 by attaining adequate technical support under the CNS and staff. All the planned positions on the CNS staff have been filled with permanent career Federal employees of the highest caliber, with the following expertise: nuclear engineer; mechanical engineer/acquisition professional; nuclear safety and operations engineer; safety engineer; nuclear safety expert; quality assurance engineer; software quality

assurance engineer; and nuclear facilities and tritium risk specialist. The CNS and technical staff personnel are required to qualify as Senior Technical Safety Managers, where applicable, under the Department's FTCP Manual.

The CNS and staff support the Energy and Science CTAs in establishing and implementing nuclear safety policies, regulations, and directives in a consistent and effective manner across the complex, and encourage, challenge, and assist site offices and Headquarters program elements in promoting nuclear safety consistent with established ISM principles. CNS and staff are actively engaged in oversight to maintain awareness of complex, high-hazard nuclear operations while promoting line ownership of nuclear safety, and provide technical expertise and support to line management for independent review of nuclear programs and projects.

Chief of Nuclear Safety Accomplishments

In 2006, CNS staff supported line management and other assessments in the following areas:

- EM's Deputy Assistant Secretary for Safety Management and Operations ISM assessment of the Savannah River Site (SRS)
- EM's Deputy Assistant Secretary for Safety Management and Operations assessment of the Integrated Waste Treatment Unit (Sodium Bearing Waste) project at Idaho National Laboratory (INL)
- EM's Deputy Assistant Secretary for Safety Management and Operations assessment of Office of River Protection and Waste Treatment Project QA program requirements management at Hanford
- EM review of Waste Treatment Project contract modifications at Hanford
- ISM verification at INL
- EM's Operational Readiness Review of Spent Nuclear Fuel K-Basins Hose-in-Hose at Hanford
- Independent Technical Review of the Salt Waste Processing Facility at SRS
- Independent review panel addressing Board concerns regarding active confinement systems as stated in Board Recommendation 2004-2
- Safety Basis Review of Pacific Northwest National Laboratory capability replacement lab project
- Technical review of the Advanced Test Reactor Design Basis Reconstitution Project
- Technical review of the Fluor Hanford Criticality Safety Program
- Technical review of the Los Alamos National Laboratory (LANL) Criticality Safety Program
- 1st quarter Criticality Safety review of Battelle Energy Alliance, CH2M/WG Idaho, and Bechtel BWXT at INL.

CNS has drafted DOE Order 410.X, *Baseline Nuclear Safety Requirements*, jointly with the CDNS, to establish CTA and CNS/CDNS responsibilities and requirements in the development and issuance of DOE regulations and directives that affect nuclear safety. The primary purpose of this order is to define the minimum nuclear requirements required for all contracts involving nuclear work, including the design of new facilities. This order, in conjunction with the revisions to DOE Order 413.3, *Program and Project Management for the Acquisition of Capital Assets*, implemented earlier this year, will allow the Department to establish a consistent management system for nuclear safety.

Important to the success of nuclear projects is the establishment of well-founded design requirements that are consistently employed across the complex. In July, EM issued its *Interim Guidance on Safety Integration into Early Phases of Nuclear Facility Design*, which was concurred with by CNS. The CNS staff continues to work on the development of Departmental policy for DOE-STD-1189, *Integration of Safety into the Design Process*, to solidify nuclear design requirements. This effort is directed at ensuring that nuclear safety requirements are established early in the design process and improving acquisition cost estimates in accordance with the Secretary's direction.

The CNS staff is independently monitoring and assessing nuclear safety-related information pertaining to acquisition strategies and plans for Energy and Science projects and activities (and their design and

operation), maintaining awareness of programmatic decisions, and assuring that the desire to meet these commitments is properly balanced with nuclear safety. The CNS staff has been actively engaged in the review of selected projects preparing for Critical Milestone Decisions at the Energy Systems Acquisition Advisory Board.

In 2006, CNS staff supported the Acquisition Critical Decision process in the following areas:

- Review of Waste Treatment Project pre-Energy Systems Acquisition Advisory Board for technical, cost, schedule, and QA program issues affecting changes in the project baseline

- Review of U-233 Downblending and Stabilization Project at Oak Ridge for CD-2/CD-3A pre-Energy Systems Acquisition Advisory Board

- Review of Final Mission Need Statement for Integrated Facility Disposition Project at Oak Ridge.

The CNS staff has been actively involved in supporting the independent review panel chartered to address Board Recommendation 2004-2, *Active Confinement Systems*. Their involvement includes participation in pilot evaluations for several facilities, including the EM Idaho Cleanup Project New Waste Calcining Facility and the SRS Actinide Removal Process, as well as NNSA SRS Pit Disassembly and Conversion Assembly and the LANL TA-55/PF-4 facility.

CNS has instituted liaison relationships with key DOE Energy and Science sites to facilitate communication between the field and CNS staff. Such relationships form an integral element in maintaining operational awareness for nuclear safety, including information exchange regarding assessment plans, significant safety issues, and the need for CNS technical staff support to the site.

2007 Chief of Nuclear Safety Expectations

In 2007, the Department will undertake some significant policy actions. These include the development of DOE Standard 1189, *Integration of Safety into the Design Process*; DOE Standard 1027, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*; and a Risk policy. All of these have the potential to significantly improve nuclear operations within the Department while maintaining our excellent nuclear safety record. The CNS will work with each line organization to ensure that a corporate approach to nuclear safety is maintained.

In addition to the policy activities that will be addressed in the coming year, the staff's top priority is to support field activities in the continued implementation of DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*, and the conduct of other nuclear safety reviews. The Department will be in its second year of implementing the Oversight order, and a continued evaluation of risks versus resources will need to be conducted to ensure appropriate oversight of the various activities. A better-developed, tiered approach to oversight that systematically accounts for the contributions of Facility Representatives', field offices' and Headquarters risk-based oversight activities is necessary. CNS staff will also contribute to scheduled operational readiness reviews, design basis reconstitution efforts, ISM activities, independent project reviews, and other activities as needed by the line. Individual staff efforts in SQA, QA, safety analysis, and criticality safety continue to be utilized by the line.

Since being fully staffed in September 2006, the Office of the CNS has made significant contributions to improving line oversight and facilitating mission accomplishment. It is a fundamental operating premise that they seek to understand in order to find solutions to difficult problems and thereby enable project execution. In 2007, they will continue to provide technical excellence in support of nuclear safety and mission accomplishment.

I. Worker Protection Program Initiatives and Improvements

The Department continued demonstrating its commitment to ensuring that DOE and DOE contractor employees are provided with a safe work environment. Most notably, on February 9, 2006, DOE published, in the *Federal Register*, a Final Rule, 10 CFR 851, *Worker Safety and Health Program*. This rule requires that DOE contractor workers be provided with a workplace that is free from recognized hazards that can cause death or serious physical harm. To accomplish this objective, the rule establishes management

responsibilities, worker rights, safety and health standards, and required training.

This rule will replace the worker protection requirements for DOE contractor employees currently in DOE Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*. Accordingly, DOE Order 440.1A will be cancelled. To cover DOE Federal employees, DOE is drafting DOE Order 440.1B, *Worker Protection Management for DOE (Including the National Nuclear Security Administration) Federal Employees*. The order is also being revised to incorporate requirements contained in DOE Notice 450.7, *The Safe Handling, Transfer, and Receipt of Biological Etiologic Agents,* dated October 17, 2001.

To assist in implementation of 10 CFR 851, on July 20, 2006, DOE provided for review and comment a draft DOE Guide 440.1-8, *Implementation Guide for Use with 10 CFR Part 851, Worker Safety and Health Program.* DOE Order 5480.4, *Environmental Protection, Safety, and Health Protection Standards* lists several worker protection standards and orders, including several that are out of date. These worker protection standards and orders will be updated and incorporated into a combination of the above referenced documents and an update to DOE Guide 441.1-1A *Management and Administration of Radiation Protection Programs Guide for use with Title 10, Code of Federal Regulations, Part 835,Occupational Radiation Protection.*

For the radiological protection of DOE workers, in August 2006, DOE published in the *Federal Register* a notice of proposed rulemaking to its occupational radiation protection regulation, 10 CFR 835, *Occupational Radiation Protection.* DOE plans to update its occupational radiation protection regulation by adopting more current international and national consensus standards and methodologies to assess worker exposures to ionizing radiation. DOE plans to publish a final rule reflecting this update during the first calendar quarter of 2007.

J. Incorporating Safety into the Design Process

In a memorandum dated December 5, 2005, the Deputy Secretary of Energy challenged his senior managers to build upon the major strengths of the Department's project management program to better integrate safety into the design of projects early in the lifecycle. Responsive to that challenge, an effort was undertaken to define the project management process by which safety becomes an integral part of the design process and document that process in a new DOE technical standard, DOE-STD-1189, *Integration of Safety into the Design Process.* This standard will address the hazard prevention and mitigation process in the design of DOE hazard category 1, 2, and 3 nuclear facilities and will address both radiological and chemical hazards.

DOE-STD-1189 is to be used in tandem with the Departmental directive on project management, DOE Order 413.3, *Program and Project Management for the Acquisition of Capital Assets,* as well as the planned guides to support implementation of this order. It will also build upon and augment the facility safety criteria documented in DOE Order 420.1B, *Facility Safety*. DOE STD-1189 will provide the key course of action for ensuring that safety is incorporated into the baseline design of the Department's nuclear facilities.

To ensure that hazard prevention and mitigation are addressed in the fundamental design of a project, the standard will establish an integrated team approach to review the design at various stages and incorporate safety aspects. The role of the integrated team will be to ensure that appropriate and reasonably conservative safety structures, systems, and components are incorporated early in the design process; that the project cost estimates include these structures, systems, and components; and that the project risks associated with the selections are specified to support informed risk decision making by the Project Approval Authorities. In alignment with DOE Order 413.3, a key aspect of integrating safety and design as described in this standard is early identification of project risks and communication among project team members to achieve the best facility specific solution for these risks. Applying this standard will minimize the potential for significant cost and schedule impacts from changing safety system design requirements late in the project lifecycle.

DOE-STD-1189 is scheduled to be posted on the Department's web-based review and comment system for consensus review in the spring of 2007.

K. DOE's Differing Professional Opinions Policy and Manual

In the *Department of Energy Action Plan Lessons Learned from the Columbia Space Shuttle Accident and Davis-Besse Reactor Pressure-Vessel Head Corrosion Event*, July 2005, the Department committed to develop

and issue a process to address Differing Professional Opinions. In November 2006, DOE issued DOE Policy 442.1, *Differing Professional Opinions on Technical Issues Related to Environment, Safety, and Health*, and DOE Manual 442.1-1, *Differing Professional Opinions Manual for Technical Issues Involving Environment, Safety and Health*. These directives provide a policy and a process for encouraging dialogue and resolution on Differing Professional Opinions from employees (both Federal and contractor) for technical issues involving environment, safety, and health at DOE facilities. Furthermore, concerns submitted to the DOE employee concerns program that fall within the scope of the Differing Professional Opinions process (environment, safety, and health technical issues that were not submitted anonymously) can be processed through the Differing Professional Opinions process. The Differing Professional Opinions process was developed to elevate and disposition environment, safety, and health technical issues in a timely manner by alerting senior management to technical differences of opinion. To facilitate processing Differing Professional Opinions, two Differing Professional Opinions Managers were appointed (one in the Office of Health, Safety and Security, the other in the Office of National Nuclear Security Administration). The directives were coordinated with the Board and enhancements were included in the Differing Professional Opinions process in response to Board comments.

III. Implementation of Board Recommendations

The Board issues recommendations to the Secretary on issues or circumstances to be resolved to ensure adequate protection of the public health and safety. The Secretary is required to respond to each Board recommendation within 45 days of publication of the recommendation in the Federal Register. In addition, the Secretary must submit an implementation plan to the Board within 90 days of publication in the Federal Register of the Secretary's acceptance of the recommendation. The Department's policy is to begin implementation plan development in parallel with the development of the Department's response as outlined in DOE Manual 140.1-1B, *Interface with the Defense Nuclear Facilities Safety Board*.

The Board has issued 48 recommendations to the Secretary since the Board was established in 1988. The Secretary has accepted 44 of the Board's recommendations in their entirety, and accepted 4 with minor exceptions and clarifications. For each accepted recommendation, the Secretary has approved the Department's implementation plan. Thirty-five of the Board's recommendations are now closed. Thirteen recommendations remain open; the Secretary has proposed closure of four of those recommendations. The Department is actively taking steps to resolve the safety issues from the remaining recommendations.

A. Recommendation Closures

The Board closed one recommendation in 2006.

Recommendation 95-2, *Safety Management* (95-2)

On November 21, 2006, the Board agreed with DOE's closure of Recommendation 95-2. The Board issued Recommendation 95-2 on October 11, 1995. On January 17, 1996, the Secretary accepted the recommendation. The primary area of concern was safety management issues. The implementation plan was issued by the Secretary on April 18, 1996.

Board Recommendation 95-2 called for: (1) an institutionalized process for ensuring that environment, safety, and health requirements are met; (2) graded safety management plans for the conduct of operations; (3) a prioritized list of facilities based on hazards and importance; (4) direction and guidance for the safety management process; and (5) measures to ensure availability of technical expertise to implement the streamlined process effectively.

The Secretary accepted the recommendation on January 17, 1996, then approved the implementation plan and provided it to the Board on April 18, 1996. The Department completed all implementation plan commitments between 1996 and 1998. ISM remains the Department's central framework for completing work while protecting the public, the workers, and the environment. ISM is also the core of the Department's commitment to building a robust safety culture.

In related activities, as part of the Department's implementation plan to implement Board Recommendation 2004-1, the Department embarked upon a series of actions to revitalize ISM implementation, with particular focus on strengthening DOE federal actions and contractors' continuous improvement. These actions included establishment of a DOE-wide ISM Champion and DOE ISM Champions for each program and field office. In October 2006, the Department completed development and issuance of a new DOE directive on ISM, the ISM System Manual, and DOE Manual 450.4-1, *Integrated Safety Management System Manual*. The Department conducted three workshops during 2006 to promote revitalization and sharing of lessons learned. On November 21, 2006, the Board closed recommendation 95-2.

B. Recommendations Proposed for Closure

The Department proposed closure of one recommendation in 2006: Recommendation 2000-2, *Configuration Management, Vital Safety Systems*.

The Board has not agreed with DOE's closure of Recommendation 2000-2.

Recommendation 2000-2, *Configuration Management, Vital Safety Systems* (2000-2)

The Secretary proposed closure of Recommendation 2002-2 in a May 26, 2006, letter to the Board.

The Board issued Recommendation 2000-2 on March 8, 2000. This recommendation addressed the Board's concern that many of the Department's defense nuclear facilities, constructed years ago, were approaching the end of their design life, and that a combination of age-related degradation and deficient maintenance could affect the reliability and ability of the vital safety systems to perform their safety functions as designed. Also of concern was the Department's capability to apply engineering expertise to maintain the configuration of these systems. Specifically, the recommendation identified possible degradation in confinement ventilation systems and noted the Department's lack of designating system engineers for systems and processes that are vital to safety.

The Secretary accepted the recommendation on April 28, 2000. The Board elaborated on the intent of 2000-2 in a letter to the Secretary on September 8, 2000. The Secretary approved the 2000-2 implementation plan on October 31, 2000. In January 2004, the Department completed the last implementation plan commitment. The Department has continued to focus on institutionalization of the 2000-2 actions. In May 2006, the Secretary concluded that 2000-2 improvements were sufficiently institutionalized to propose recommendation closure. Keeping this recommendation open provides no additional benefit to the Department, since the Department has now established sufficient internal requirements and expectations to sustain performance in this area.

The 2000-2 implementation plan is a Department-wide effort that required more than one year to execute and institutionalize due to the complex and widespread actions necessary to meet commitments in the plan.

The Department proposed closure of three recommendations prior to 2006:

- Recommendation 98-1, *Resolution of Safety Issues Identified by Internal Independent Oversight*
- Recommendation 94-1, *Improved Schedule for Remediation*.
- Recommendation 92-4, *Multi-Function Waste Tank Facility at Hanford Tank Farms*.

These three recommendations remain open.

Recommendation 98-1, *Resolution of Safety Issues Identified by Internal Independent Oversight* (98-1)

As stated in last year's report, the Secretary proposed closure of this recommendation in a November 13, 2001, letter to the Board.

On September 28, 1998, the Board issued Recommendation 98-1 concerning specific weaknesses in the Department's process to effectively address and resolve findings identified by its internal Office of Independent Oversight. The Secretary accepted the recommendation on November 20, 1998, and on March 10, 1999, approved the Department's implementation plan for establishing a systematic approach for developing, tracking, reporting, and effectively resolving findings identified by the Office of Oversight. The implementation plan outlined specific actions, deliverables, and milestones for establishing a consistent and disciplined process to improve the Department's corrective action process. It included establishing clear roles, responsibilities, and authorities; a process for elevation of disagreements up to the Secretary; senior management involvement; corrective action tracking and reporting; and verification of corrective action closure. The Department completed all implementation plan commitments as of September 2000.

The Department submitted a Final Report to the Board on Recommendation 98-1 in November 2001. The report outlined a summary of actions taken to resolve the issues in the Board's recommendation and provided a basis for closure of the recommendation. In January 2002 the Board acknowledged these accomplishments, but indicated that an update to three program-specific Functions, Responsibilities, and Authorities documents would be required for Board closure. Subsequently, these three organizations – the NNSA, the Office of Independent Oversight and Performance Assurance, and the Office of Environment, Safety and Health (ES&H) – issued their Functions, Responsibilities, and Authorities documents. All of these Functions, Responsibilities, and Authorities documents were updated by October 2003. The conditions outlined in the Board's January 2002 letter have been long since met.

The Department's Corrective Action Management Program (CAMP) has continued to coordinate and assist line managers in improving the tracking, reporting, and effective completion of 531 corrective actions (during fiscal year 2006) in response to over 107 findings reported by Operations Awareness in ES&H and EM assessments, Type A accident investigations, and other assessments as directed by the Secretary and Deputy Secretary.

Major accomplishments to enhance and institutionalize the Department's 98-1 implementation plan during 2006 include:

- **Issuance of DOE Guide 414.1-5, *Corrective Action Program Guide,*** which delineates basic principles, concepts, and lessons learned that DOE managers and contractors may consider in implementing corrective action programs. The guidelines are applicable to work activities, operational events, informal and formal individual and organizational self-assessments, internal and external oversight, investigations, audits, worker safety concerns, and other types of incidents and assessments.

- **Continual update of the DOE CAMP web site** (www.eh.doe.gov/camp/ index.html). This website provides access to the background, directives and references, Corrective Action Management Team charter, Corrective Action Tracking System database, and DOE CAMP quarterly reports disseminated to the Office of the Secretary and senior DOE managers.

- **Continued close coordination with the Corrective Action Management Team,** a chartered cross-organizational working group of representatives from DOE Headquarters and field elements supporting and coordinating line management implementation of the CAMP.

- **Continued DOE-wide reporting on the status of corrective action effectiveness reviews,** which became a CAMP requirement in 2004. Effectiveness reviews determine whether the completed corrective actions for each finding effectively resolved and will prevent recurrence of the same or similar findings at the performance level. They are required to be completed and formally reported by the field element manager within six months after completion of all corrective actions listed in the corrective action plan.

- **Continued coordination, information, and assistance** to Department Headquarters and field element managers and assessing organizations on CAMP activities.

The Department believes that the actions taken in response to this Board recommendation are fully implemented and fully institutionalized. The Department intends to continue the performance of these activities in the future. The Department knows of no issues that need to be addressed relative to these activities and continues to consider actions in response to this recommendation to be complete.

Recommendation 94-1, *Improved Schedule for Remediation* (94-1)

As stated in last year's report, the Secretary proposed closure of 94-1 in a June 8, 2000, letter to the Board. This recommendation addressed the hazards and risks involving the storage of nuclear materials within the Department's defense nuclear facilities complex. The most urgent safety issues described in the recommendation have either been corrected or had compensatory measures put in place to protect workers and the public until stabilization can be completed. To re-emphasize the urgency the Board placed on the remaining nuclear material stabilization activities, in January 2000 the Board issued Recommendation 2000-1, *Stabilization and Storage of Nuclear Material*.

The Department continues to view the scope of Recommendation 2000-1 as essentially the same as the remaining 94-1 activities. In the Department's 2000-1 implementation plan, the Department included all remaining 94-1 activities. Accordingly, with the approval and delivery of the 2000-1 implementation plan in June 2000, the Secretary proposed closure of 94-1 to the Board.

Recommendation 94-1 is essentially redundant to recommendation 2000-1, which is being satisfactorily implemented.

Recommendation 94-1 is now of value from a historical perspective only. This recommendation remains open while the Board monitors progress on 2000-1 plan implementation.

Recommendation 92-4, *Multi-Function Waste Tank Facility at Hanford* (92-4)

As stated in last year's report, the Secretary proposed closure of 92-4 in a December 16, 1998,

letter to the Board. This recommendation addressed safety issues at the Tank Waste Remediation System Multi-Function Waste Tank Facility project at the Hanford Site. The recommendation identified three areas of concern:

- Project management structure
- Design bases (systems engineering) for the Multi-Function Waste Tank Facility
- Technical and managerial competence.

In developing an implementation plan to address these issues, the Department expanded the scope of its response to apply an integrated systems approach to define, plan, control, and execute the overall Hanford mission. While implementing this approach, the Department re-evaluated the need for the Multi-Function Waste Tank Facility project, canceled the project, and altered other Tank Waste Remediation System projects.

The Department completed 38 plan milestones, including all program management and site systems engineering commitments, in the original implementation plan and all milestones in revision one to the implementation plan. The final implementation plan deliverable was completed and provided to the Board in July 1998.

The Board has identified no additional activities it believes the Department needs to take in relation to the safety issues of this recommendation. The Department is unaware of any additional actions that need to be taken to close this recommendation, which was issued over 13 years ago and proposed for closure more than 7 years ago.

C. New Recommendations

The Board issued no new recommendations in 2006.

D. Other Open Recommendations

Department progress on the remaining implementation plans for open Board recommendations is described below.

Recommendation 2005-1, *Nuclear Material Packaging* (2005-1)

The Board issued Recommendation 2005-1 on March 10, 2005, on technically justified criteria for packaging systems for nuclear materials on a DOE-wide level. This recommendation addresses issuance of a requirement that nuclear material packaging meet technically justified criteria for safe storage and handling outside of engineered contamination barriers. The Secretary accepted the recommendation on May 6, 2005, and approved the associated implementation plan on August 17, 2005.

The Department's implementation plan includes several interim milestones and formal deliverables that will result in issuance of a new interim packaging and storage requirements document for nuclear materials; preparation of a methodology for assessing and, if necessary, prioritizing the repackaging of materials in order to comply with the new requirements document; and development of both site-specific and Department-wide schedules for implementing the new requirements. A draft Nuclear Materials Storage Manual has been completed, as well as a methodology for prioritizing the repackaging of materials. These documents will be revised to incorporate comments from both the Board and the DOE technical review board, and then issued for field use in early 2007. Schedules for implementation at defense nuclear facilities will be developed in mid-2007.

Due to the complexity of existing storage configurations, the time required to publish a new requirements document, and the time needed to develop site implementation plans and consolidate them into a Department-wide plan, final completion will require more than one year. The last deliverable is currently expected to be issued in mid-2007.

Recommendation 2004-2, *Active Confinement Systems* (2004-2)

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

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

The first step of the review is for DOE to establish criteria to exclude certain facilities and operations from further review based on sound safety considerations. For facilities not excluded, the focus of review will be to (a) verify that appropriate performance criteria are derived for ventilation systems; (b) verify that these systems can meet the performance criteria, if applicable; and (c) determine whether any physical modifications are necessary to enhance safety performance. The implementation plan further commits to revise DOE directives and standards to formalize the evaluation criteria and capture lessons learned. On September 19, 2005, the Board accepted the implementation plan.

Six actions were completed in 2006. Guidance for the evaluation of both safety-related and non-safety-related ventilation was completed. A list of hazard category 3 facilities that utilize active confinement ventilation systems was compiled, as well as a list of facilities that require ventilation system evaluations. An independent review panel was established to serve as a review and quality check for the ventilation system evaluations. As part of this recommendation, both EM and NNSA were to complete a pilot study at two facilities. EM has completed both pilot studies, and NNSA is in the process of reviewing the pilot studies for its facilities. The independent review panel will issue a report on these pilots, along with recommendations for revising the evaluation guidance in the first quarter of 2007.

In addition to the above, both EM and NNSA have issued expectations to their respective facilities regarding the completion schedule, standards, and processes to be used to ensure a quality review. Implementation of 2004-2 will require more than one year to complete due to the magnitude and scope of the actions, including site assessments and revision of Department standards and directives. The Department currently projects completion of the 2004-2 implementation plan in 2007.

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

The Board issued Recommendation 2004-1 on May 21, 2004, noting concerns regarding a number of safety issues related to central technical authority, delegations of safety responsibilities, technical capability, nuclear safety research, lessons learned from significant external events, and ISM. The Secretary accepted the recommendation on July 21, 2004, approved the associated implementation plan on December 23, 2004, and approved revision 1 to this implementation plan on June 10, 2005. In April-May 2006, the Department again reviewed the 2004-1 implementation plan commitments.

Based on the results of this review and experience with implementation to date, the Department developed revision 2 of the 2004-1 implementation plan, which was approved and issued on October 12, 2006.

In response to the Board's recommendation, the Department's implementation plan identifies three broad areas for improvement:

- Strengthening Federal safety assurance
- Learning from internal and external operating experience
- Revitalizing ISM implementation.

During 2006, the Department completed the following implementation plan actions:

- In January 2006, NNSA completed staffing with the technical personnel needed to support the NNSA CTA in fulfilling assigned responsibilities.
- In March 2006, the Under Secretary of Energy completed implementation of the new process and criteria for delegation of safety responsibilities.
- In March 2006, EM completed implementation of updated QA Plans at its site offices.
- In March 2006, the Department completed development of site action plans to improve work planning and work control.

- In March 2006, the Department completed development of site action plans to improve feedback and improvement core element performance.

- In July 2006, the Department completed and issued its new Department directive on evaluating and applying operational experience information in DOE Order 210.2, *DOE Corporate Operating Experience Program*.

- In August 2006, the Department provided a briefing to the Board on the Department's status in implementing the 2004-1 implementation plan.

- In September 2006, NNSA completed implementation of updated QA Plans at its site offices.

- In October 2006, the Department completed establishment of its plan for providing structured training for its safety professionals, senior managers, and decision-makers responsible for nuclear safety, including those responsible for nuclear safety oversight.

- In October 2006, the Under Secretary of Energy completed staffing with the technical personnel needed to support the Energy CTA in fulfilling assigned responsibilities.

- In November 2006, the Department completed development and issued its new Department directive on ISM in DOE Manual 450.4-1, *Integrated Safety Management System Manual*.

- In November 2006, EM implemented the EM QAP Plan, dated November 11, 2005, and provided training to 97 percent of its Headquarters staff.

As previously reported, this plan will require more than one year to complete because of the magnitude and complexity of the issues being addressed. Complex and lasting change in large organizations requires multiple years to implement and verify. The last milestone contained in the current 2004-1 implementation plan has a 2008 completion date.

Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls* (2002-3)

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

- Review existing requirements and guidance to determine whether supplemental guidance was needed to address safety-related administrative controls (now called specific administrative controls)

- Issue supplemental guidance on specific administrative controls and provide training

- Evaluate safety basis documents to determine whether existing administrative controls met Department expectations and identify actions to upgrade controls when necessary

- Evaluate field implementation of specific administrative controls

- Strengthen Departmental processes to ensure that specific administrative controls are properly designed, implemented, and maintained.

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

- Developing a Nuclear Safety Management Technical position

- Developing training materials for contractors and Federal employees

- Conducting reviews of facility safety bases to ensure that specific administrative controls are properly implemented

- Revising DOE-STD-3009-94, *Preparation Guide for U.S. DOE Nonreactor Nuclear Facility Safety Analysis Reports*, to address specific administrative controls.

The Department expects to propose closure of this recommendation in early 2007. Implementation of the 2002-3 plan required more than a year to complete due to the magnitude and scope of the actions, including site assessments and revision of Department standards and directives.

Recommendation 2002-1, *Quality Assurance for Safety-Related Software* (2002-1)

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

The Secretary accepted the Recommendation in November 2002 and approved the 2002-1 implementation plan in March 2003. Implementation leadership is assigned to the Office of Corporate Safety Analysis within the Office of Health, Safety and Security. The Department has completed all milestones identified in the implementation plan. DOE briefed the Board on the status of 2002-1 activities on March 13, 2006.

At that time, the Board agreed to consolidate the periodic briefings on quality assurance initiatives with SQA briefings associated with Recommendation 2002-1. The Department has initiated informal communication with the Board staff regarding closure of this recommendation.

Implementation of the 2002-1 plan required more than a year to complete due to the technical complexity and widespread actions necessary to fully meet all commitments outlined in the plan.

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

The Board issued Recommendation 2001-1 on March 23, 2001. This Recommendation addressed the margin of safety and maintenance of the amount of tank space in the SRS HLW system to enable timely stabilization of nuclear materials.

The Secretary accepted the Recommendation and provided an initial implementation plan on May 18, 2001. The Board amplified its expectations for this Recommendation in a May 24, 2001, letter to the Secretary. The Secretary approved and issued revision 1 to the 2001-1 implementation plan on September 14, 2001.

Commitment 2.6 of revision 1 called for the Department to develop and submit new commitments related to the implementation of the revised salt processing program. The Secretary approved and issued revision 2 to the 2001-1 implementation plan on May 10, 2002.

In 2005, the Department, in consultation with the Nuclear Regulatory Commission, worked to develop a Waste Determination in accordance with the requirements of Section 3116 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005.

Two revisions of the implementation plan were provided during 2006. On January 17, 2006, the implementation plan was updated to incorporate substantial changes in the SRS salt disposition program. On July 11, 2006, a revision of the implementation plan was provided reflecting changes in program direction as a result of the program delays and feedback from the State of South Carolina. A total of 23 of the 30 milestones in the plan were complete as of December 2006.

The key accomplishments related to implementing the Department's 2001-1 plan during 2006 are as follows:

- In April 2006, the Department completed a technical evaluation of acceptable Tank 48 organic residual levels and a plan for returning Tank 48 to active waste service.

- In December 2006, the Department provided the Program Evaluation for integration of Liquid Waste processing facility.

As previously reported, completion of this plan has taken more than one year due to the associated work scope to fully complete the planned activities. The Department estimates completion of all actions and milestones for the 2000-1 implementation plan in September 2011.

Recommendation 2000-1, *Stabilization and Storage of Nuclear Materials* (2000-1)

The Board issued Recommendation 2000-1 on January 14, 2000. This Recommendation addressed the urgency for completing nuclear material stabilization activities that the Department previously agreed to pursue in the Recommendation 94-1 implementation plan. Recommendation 2000-1 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.

Revision 1 of the 2000-1 implementation plan was provided on January 19, 2001, to reflect changes in the schedule for stabilization activities at LANL as outlined in the June 2000 plan and consistent with the July 2000 letter. On July 22, 2002, the Secretary approved revision 2 of the 2000-1 implementation plan that incorporated an improved schedule for stabilization activities at LANL and SRS, as well as several previously approved milestone changes. It further designated the Chief Operating Officer in EM as the Responsible Manager for EM sites, and the NNSA Deputy Administrator for Defense Programs as the Responsible Manager for LANL and LLNL. On November 28, 2005, the Secretary approved a revision of the 2000-1 implementation plan specific to the Hanford Section reflecting new information on the techniques necessary to safely handle the sludge in the K-Basins at Hanford and appropriate contingency plans for the risks to the project.

The key accomplishments related to implementing the Department's 2000-1 plan during 2006 are as follows:

- In September 2006, SRS completed stabilization of the pre-existing neptunium solutions that were stored in H-Canyon, which was the last of 54 Savannah River commitments in the implementation plan.

- In October 2006, Richland completed the bulk sludge containerization at K East Basins.

As previously reported, the 2000-1 implementation plan requires more than one year to complete due to the technical complexity and diversity of material requiring stabilization at affected defense nuclear sites. Only two sites have additional 2000-1 stabilization activities to complete: Richland and Los Alamos. The Department estimates completion of all actions and milestones for the 2000-1 implementation plan in December 2009.

Recommendation 98-2, *Safety Management at the Pantex Plant* (98-2)

The Board issued Recommendation 98-2 on September 30, 1998. This Recommendation addressed the need to accelerate safety improvements for nuclear explosive operations at the Pantex Plant. Recommendation 98-2 represents a combination of issues raised in prior Board recommendations and staff observations of Pantex activities.

The Secretary accepted Recommendation 98-2 on November 28, 1998. The Secretary approved the implementation plan and provided it to the Board on April 22, 1999. Leadership for implementation is assigned to the NNSA Assistant Deputy Administrator for Military Applications and Stockpile Management.

The implementation plan was revised and provided to the Board on September 25, 2000. Revision 1 introduced a fundamental change in the Department's approach by increasing the focus and priority in making safety improvements applicable to multiple nuclear weapon processes. The Department continues to apply the concepts of Seamless Safety for the 21st Century (SS-21) to individual weapon processes in accordance with the Integrated Weapons Activity Schedule. However, the Department believes that major safety improvements can be gained by focusing on improved engineering controls applicable to multiple weapon programs and processes. Thus, the Department can achieve tangible improvements in safety on a near-term basis, allowing weapon project teams to focus on further eliminating or reducing hazards through process redesign, as required.

On October 25, 2002, the Department provided the Board with change 1 to revision 1 of the implementation plan. This change updated the dates of several remaining commitments and added a new commitment to accelerate SS-21 tooling for the W78 and W88 weapon systems.

The Department continues to take active steps to complete the milestones in the 98-2 implementation plan. Twenty-four of the 27 milestones have been met. A key accomplishment during 2006 was the issuance of DOE Limited Standard, DOE-NA-STD-3016-

2006, *Hazard Analysis Reports for Nuclear Explosive Operations*.

Remaining activities are as follows:

- The final commitment requires a report summarizing the actions taken in response to this recommendation.

NNSA expects that Recommendation 98-2 can be closed in 2007 with no additional incremental costs. The 98-2 implementation plan required more than a year to complete due to the magnitude and complexity of changes.

Recommendation 97-1, *Safe Storage of Uranium-233* (97-1)

The Board issued Recommendation 97-1, on March 3, 1997. This Recommendation addressed safety issues for storing the existing inventories of unirradiated uranium-233 (U-233) bearing materials. The Department accepted the recommendation on April 25, 1997. The Secretary approved the implementation plan and provided it to the Board on September 29, 1997. The Secretary assigned leadership of plan implementation to a Task Team reporting to the Department's Assistant Secretaries for Defense Programs and EM.

The Department has an inventory of approximately two metric tons of uranium mixed or alloyed with uranium-233 in many different chemical and physical forms and stored under a variety of conditions throughout the complex. The largest quantities are located at the Oak Ridge National Laboratory (ORNL) and INL, with lesser amounts at Los Alamos and other sites.

All implementation plan commitments were completed by July 1999. The Department is in the process of developing plans for the disposition of its U-233 inventories.

Idaho National Laboratory Activities

INL has several populations of material containing U-233. One population of U-233 has been managed as special nuclear material. Other populations are not in the inventory and have been managed as low-level waste. For each population, the INL has evaluated two major strategies: 1) recycling and 2) disposal of U-233 material at that site. On December 4, 2002, INL informed the DOE complex of the availability of 28 special nuclear material types, including U-233. Any and all materials on the list were made available to any program office or site. All responses were negative, and therefore INL decided to dispose of its U-233 inventory as waste.

INL evaluated disposal of its inventory of U-233 as spent nuclear fuel within the monitored geological repository. It was determined that this material does not meet the definition of spent nuclear fuel, or TRU waste, and INL plans to dispose of this material as low-level radioactive waste. INL, with appropriate members of the Nevada Test Site (NTS) staff, is evaluating the INL U-233 inventory against the waste acceptance criteria for the NTS for possible disposal. All INL U-233 material is safely and securely managed within dry storage and will remain so until a disposition path is determined and executed.

Oak Ridge National Laboratory Activities

In June 2002, the Department issued Request for Proposal No. DE-RP05-00OR22860, *Uranium-233 Disposition Medical Isotope Production, and Building 3019 Complex Shutdown* to process the U-233 in Building 3019 to eliminate criticality and proliferation concerns through down blending, to extract thorium-229, and to remove the U-233 so that the 3019 Complex can be deactivated. In October 2003, the contract was awarded to Isotek Systems, LLC, a consortium of Duratek Federal Services, Inc., Burns and Roe Enterprises, Inc., and Nuclear Fuel Services, Inc. The base contract award is for Phase I, *Planning and Design* with options for Phase II, *Project Implementation* and Phase III, *Building 3019 Complex Shutdown* being unilaterally exercised by the Department.

During FY 2005, activities in Building 3019 centered on preparations for the transfer of the building to the control of Isotek. This transfer was originally scheduled to take place in July 2005, but was delayed due to uncertainties with Phase II of the planned project. Work proceeded during the year to put into place the required agreements necessary for Isotek to operate the facility in the midst of the ORNL. These agreements included provisions for the supply of utilities, fire protection, and security for the facility. In addition, Isotek has planned to use existing employees to insure a smooth transition in facility operation. These employees were trained on the newly developed Isotek procedures for building operation.

In November 2005, Congress directed DOE to terminate the Medical Isotope Production and

Building 3019 Complex Shutdown project at the ORNL. Congress also directed that responsibility for disposition of the U-233 be transferred to the Defense EM program per DOE's recommendation, and provided resources for the disposition of the material stored in Building 3019.

DOE has assigned an interim Federal Project Director and assembled an Integrated Project Team. DOE is in the process of selecting a permanent Federal Project Director, and the Integrated Project Team will be finalized after the selection. Efforts are under way to assess the disposition possibilities for the U-233 currently stored at ORNL and provide a report. Regardless of the possible disposition path for the U-233, DOE's focus continues to be transforming the U-233 material into a safer and more secure form in the most expeditious and cost effective manner possible.

The 97-1 implementation plan required more than one year to execute due to complexity of the actions. As previously reported, all milestones in the plan were met as of July 1999. The Department continued with efforts to complete and institutionalize actions set in motion by its implementation plan. The Department expects to propose closure in 2007.

E. Report on Implementation Plans Requiring More Than One Year

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

- 92-4, *Multi-Function Waste Tank Facility at Hanford Tank Farms*[1]
- 94-1, *Improved Schedule for Remediation*[1]
- 97-1, *Safe Storage of Uranium-233*[1]
- 98-1, *Resolution of Safety Issues Identified by Internal Independent Oversight*[1]
- 98-2, *Safety Management at Pantex*[1]
- 2000-1, *Stabilization and Storage of Nuclear Material*[1]
- 2000-2, *Configuration Management, Vital Safety Systems*[1]
- 2001-1, *High-Level Waste Management at the Savannah River Site*[1]
- 2002-1, *Quality Assurance for Safety-Related Software*[1]
- 2002-3, *Design, Implementation, and Maintenance of Administrative Controls*[1]
- 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*[1]
- 2004-2, *Active Confinement System*[1]
- 2005-1, *Nuclear Material Packaging*[1]

Tables 3.A, 3.B, and 3.C categorize the open recommendations by their anticipated completion dates.

[1] Previously reported to require more than one year to implement.

Table 3.A – Implementation Plans with All Commitments Complete

Open Recommendations
2002-3, *Design, Implementation, and Maintenance of Administrative Controls*
2002-1, *Quality Assurance for Safety-Related Software*
2000-2, *Configuration Management, Vital Safety Systems*
98-1, *Resolution of Safety Issues Identified by Internal Independent Oversight*
97-1, *Safe Storage of Uranium-233*
94-1, *Improved Schedule for Remediation* (remaining commitments transferred to the 2000-1 plan)
92-4, *Multi-Function Waste Tank Facility at Hanford Tank Farms*

Table 3.B – Implementation Plans with Projected Completion Dates in 2007

Open Recommendations
2005-1, *Nuclear Material Packaging*
2004-2, *Active Confinement System*
98-2, *Safety Management at Pantex*

Table 3.C – Implementation Plans with Projected Completion Dates After 2007

Open Recommendations
2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*
2001-1, *High-Level Waste Management at the Savannah River Site*
2000-1, *Stabilization and Storage of Nuclear Material*

F. Summary of Projected Costs of Remaining Actions

The House Report accompanying the Fiscal Year 2004 Energy and Water Development Appropriations Act, P.L. 108-137, (House Report 108 – 112, p. 112, summarized below) contains requests for the Department to provide a cost estimate and schedule on remaining actions for open Board recommendations.

> **Safety at DOE Facilities.** The Committee expressed concern that the Department is unable to quantify the backlog of safety-related deficiencies in its defense facilities and sites. The Department tracks the number of Board recommendations that still need to be addressed, but does not obtain detailed information on the estimated costs of the corrective actions.
>
> Beginning in 2005, the Department is directed to collect the necessary information and report to Congress annually on the backlog of safety-related deficiencies at NNSA and cleanup sites, and present an estimate and schedule for the corrective actions.

The conference managers concurred with these instructions (House Report 108-357, p. 137).

Table 3.D summarizes the remaining work activities associated with open Board recommendations and the projected costs for these activities. Where activities are not identified in this table, either they are substantially completed, or their costs are readily accommodated within existing budgets for program management. For example, Board Recommendation 2000-2 called for periodic assessments of safety systems; these periodic assessments are not ongoing as a normal procedure at all affected Department sites and are not reported in the table.

The Department's policy and practice is to complete identified safety improvements as expeditiously as possible. The Department reviews and prioritizes improvement tasks to determine acceptable time frames and then actively manages identified improvements to completion.

Table 3.D – Summary of Projected Costs of Remaining Actions

Board Recommendation	Primary Sites Affected	Primary Improvement Activities (and Projected Costs)
2005-1, *Nuclear Material Packaging*	Multiple	**HQ –** Provide management with technical support for developing Nuclear Material Manual ($75K in FY 2007). Provide technical assistance in implementing manual ($50K in FY 2008). **DOE –** Implement new manual ($1M in FY 2007, $10 M in FY 2008, and $10M in FY 2009).
2004-2, *Active Confinement System*	Multiple	**NNSA** – Completed first of 26 ventilation system evaluations to determine if criteria was met. The evaluation determined that a modification to this system, estimated to cost approximately $100K, is required. **Remainder** – Projected costs for potential modifications to the remaining systems can not be estimated until the evaluations are made.
2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*	Multiple	**NNSA sites** – Improve work planning and control; Develop and implement Operating Experience Program and oversight systems ($5M in FY 2007)
2001-1, *High-Level Waste Management at the Savannah River Site*	Savannah River	Six commitments remain open in the Department's implementation plan for recommendation 2001-1. Construction is essentially complete on the three interim salt processing projects with only startup testing costs remaining. The other three commitments contain projects that have not yet been formally baselined; however, preliminary scoping estimates indicate the cost to be around $1B.
2000-1, *Stabilization and Storage of Nuclear Material*	Richland, Los Alamos	**Richland** – Remove and package sludge from K East and K West basins ($245.3 M)**.** **Los Alamos –** LANL has completed the mid-point milestone commitments in the implementation plan. This includes the stabilization, repackaging and disposition of 118.5 Kg of non-weapons grade material (milestone = 83 Kg), 383.8 Kg of weapons grade material (milestone = 377 Kg). Furthermore, 126.1 Kg of this material was processed through the recovery evaluation process (milestone = 124 Kg). FY07 - FY10 estimated costs to completion are $60M.

IV. Safety Accomplishments and Activities at Major Defense Nuclear Sites

A. Carlsbad Field Office (CBFO)

The Carlsbad Field Office (CBFO) manages the DOE's National TRU Program Office and the Waste Isolation Pilot Plant (WIPP) facility operations, as well as serving as an international center for the study of waste management. The CBFO coordinates the TRU program at waste-generating sites, national laboratories, and other participants involved in developing the permanent disposal of TRU radioactive waste.

New Mexico Secretary of the Environment Department Ron Curry and New Mexico Governor Bill Richardson sign the WIPP RH and Section 311 Permit

The WIPP is a non-reactor nuclear facility providing safe and permanent disposal of defense TRU and TRU-mixed waste in subterranean salt beds 2,150 feet beneath the desert of southeastern New Mexico. Since the opening for TRU waste disposal in 1999, the WIPP has played a crucial role in helping the Department meet its commitments to environmental cleanup around the nation. The WIPP has been successful in integrating safety into programmatic mission, as demonstrated by safe characterization, transportation, and disposal of TRU waste.

Operational and Safety Accomplishments at the Waste Isolation Pilot Plant

The WIPP continues to play a major role in completing cleanup throughout the EM complex, receiving more than 5,000 shipments and disposing of over 42,000 cubic meters of TRU waste since opening. Significant efforts were made by management and line workers at all levels, which resulted in the following operational and safety accomplishments during 2006:

- Received and disposed of over 10,500 cubic meters (approximately 1,125 shipments) of contact handled (CH) TRU waste in 2006. Both are new records for WIPP. As of mid-December the total volume of TRU waste disposed of in the WIPP underground rooms was over 44,500 cubic meters.

- Including all participant organizations, achieved a low Total Recordable Case rate of 0.7. The WIPP also achieved a 0.1 case rate for Days Away, Restricted, and Transferred.

- Certified/recertified TRU waste programs for six sites in FY 2006.

- Completed the contractor operational readiness review (ORR) for receiving remote handled (RH) TRU waste.

10-160B RH-Cask in the WIPP Facility

- Worked with the New Mexico Environment Department and stakeholders during numerous interactions, and supported public hearings to receive a permit to receive and dispose of RH TRU waste. In early FY 2007 the New Mexico Environment Department issued a revised hazardous waste facility permit enabling WIPP to receive and dispose of RH TRU radioactive waste currently stored at DOE cleanup sites across the country.

- Completed all remaining TRU waste from the NTS, including the RFETS classified debris waste, and removed legacy waste from Battelle Columbus Laboratories.

- Received the 20th consecutive Mine Operator of the Year award from the New Mexico Mining Association. The mine rescue teams continue their international award winning characteristics, always placing at or near the top in numerous competitions.

- Received the first five-year recertification of WIPP from the EPA as scheduled on March 29, 2006. This decision indicates that after a thorough evaluation of the physical state and performance of the facility, the WIPP meets EPA regulatory requirements for facilities that dispose of TRU waste. The waste facility recertification process occurs every five years and is directed by Congress in the WIPP Land Withdrawal Amendment Act.

Truck and RH-72B Cask Arriving at the WIPP Facility

- Received recertification approvals from the New Mexico Environment Department and the EPA for the Central Characterization Project operations at SRS, LANL, and INL.

- Successfully relocated the Transportation Tracking and Communication System operations from Albuquerque to Carlsbad, New Mexico. The Department developed the Transportation Tracking and Communication System to track and communicate with vehicles transporting "high visibility" unclassified shipments, such as spent nuclear fuel, HLW, and TRU waste. All trucks transporting TRU radioactive waste to WIPP are monitored with this system.

Activities Related to Implementation of Board Recommendations

The WIPP is committed to implementing the Board's recommendations. As of December 2006, the WIPP has no overdue Board-related commitments or actions. The following is a summary of actions taken in 2006 to support DOE EM preparations to address Board recommendations:

- During FY 2006, the CBFO CH waste documented safety analysis (DSA) was updated, and a new hazard analysis was performed that resulted in new technical safety requirements (TSRs), the addition of new limiting conditions of operation, and the addition of new safety class systems. These actions support the Department's implementation plan efforts addressing Board Recommendation 2002-3.

- During FY 2006, the RH waste DSA was approved after an intensive review of the hazards associated with handling of RH waste at WIPP.

- The continued effort to improve CBFO contractor oversight of operations at the WIPP was further improved by the implementation of the *CBFO Contractor Oversight Plan*, DOE/CBFO 04-3299. Sixteen operational assessments, 14 surveillances, and one audit were performed on ES&H at WIPP. These actions support Commitment 25 of the Department's implementation plan efforts addressing Board Recommendation 2004-1.

- Work planning and control were improved during FY 2006 by the numerous assessments noted above, and performed by the CBFO staff on the contractors operations. This was evident in the praise of and lack of finding in ES&H during the DOE RH ORR, completed in December of

FY 2007. The development of the site office action plans to improve work planning and work control supports Commitment 23 in the Department's implementation plan efforts addressing Board Recommendation 2004-1.

Horizontal Emplacement and Retrieval Equipment (HERE) for Emplacing RH Canisters in the Underground

B. Idaho Operations Office (ID)

The DOE Idaho Operations Office (ID) oversees the operations of the INL. The DOE-ID/INL mission is to develop and deliver cost-effective solutions to both fundamental and advanced challenges in nuclear energy and other energy resources, national security, and environmental management. The INL is operated for the DOE by Battelle Energy Alliance and partners, each providing unique educational, management, research, and scientific assets into a world-class national laboratory. CH2M-WG Idaho is the Idaho Cleanup Project contractor for the DOE at the Idaho site. Safety accomplishments and activities during 2006 at the DOE-ID/INL are summarized in the following sections.

Battelle Energy Alliance Safety Initiatives

Battelle Energy Alliance submitted a report that evaluated alternatives for low-level waste (LLW) disposal on August 1, 2006. The plan provided an analysis of numerous alternatives to ensure LLW disposal capacity remains available at the INL, upon closure of the Radioactive Waste Management Complex (RWMC) Subsurface Disposal Area, which will be closed as part of the Waste Area Group 7 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) closure action.

On December14, 2006, a draft Mission Need Statement (CD-0) was submitted to DOE for the Low Level Waste Disposition Project. CD-0 represents the initial step in planning a capital acquisition project. The mission need statement documents the need for continued access to LLW disposal facilities to support ongoing and future missions at the INL. A preferred LLW disposal alternative will not be selected until DOE approves an alternative CERCLA analysis and acquisition plan CD-1 for the project.

An important precedent was established by the Office of Nuclear Energy (NE) in reaching an agreement to transfer responsibility from NE to EM for treating Materials and Fuels Complex legacy RH waste (approximately 340 cubic meters), formerly planned for treatment by NE at the Materials and Fuels Complex in the Remote Treatment Project.

RWMC Low Level Waste Operations

The following is a summary of actions taken in 2006 by INL to support DOE implementation plans to address Board recommendations:

- During calendar year (CY) 2006, INL Nuclear Safety Engineering has actively participated in the Board Recommendation 2005-1 working group. The working group is responsible for drafting DOE Manual 441.1-1, *Nuclear Material Packaging Manual*. The INL contribution has focused on providing site perspective and technical input to the manual criteria. The manual is entering its final stages of review prior to being submitted for review and comment in early CY 2007.

- During CY 2006, INL quality improvement has actively supported the development of DOE Order 210.2, *DOE Corporate Operating Experience Program*. After the order's approval, the INL

completed a gap analysis that identified the current program's areas for improvement that will bring INL's processes into alignment with the new order. Currently, INL is participating in a complex-wide committee that is chartered to identify, and to the extent possible standardize, a set of performance indicators that will satisfy the new order performance indicator requirements.

- INL has included instructions for selection and use of specific administrative controls in safety analysis program documents developed in 2006. These program documents define the processes used to perform accident analysis and develop DSAs for INL nuclear facilities. The training materials utilized for training of Battelle Energy Alliance safety analysis personnel on the use of specific administrative controls in May 2005 were converted into a formal institutionalized course, *INL1124, Specific Administrative Controls*.

Preparations to Demolish the Engineering Test Reactor Stack

- INL has made significant progress in consolidating and improving the system engineer program. This includes the following: 1) assignment of system engineers to all Materials and Fuels Complex active vital safety systems; 2) revision of the INL system engineer training program to provide consistency of requirements across INL; 3) developed and implemented consistent core training for INL system engineers; 4) developed and implemented Materials and Fuels Complex facility-specific training modules; 5) developed and issued standardized system engineer roles and responsibilities, authorities, and accountabilities; and 6) issued a system engineer program document, *Nuclear Operations System Engineer Program, PLN-2274*, which provides the strategies and methods for managing the development and implementation of the INL system engineer program. DOE-ID performed an assessment of the INL system engineer program in FY 2006. This assessment resulted in no findings. The observations from this assessment are currently being addressed.

In addition to the implementation of Board recommendations, INL had additional accomplishments related to safety. During 2006, INL completed several common cause analysis reports to identify opportunities for improvement in organizational elements and individual performance of work.

During CY 2006, INL obtained Phase I certification for the INL ISMS. Phase II certification is scheduled to be completed in 2007. The new INL program consolidates the previous contractor's program and enhances the work planning and work control process with an electronic hazard identification and mitigation tool called Hazard and Risk Planning System.

Bechtel BWXT Idaho Safety Initiatives

The Advanced Mixed Waste Treatment Facility is DOE's most advanced waste treatment facility and is a cornerstone of DOE's commitment to prepare and ship waste out of Idaho. The Advanced Mixed Waste Treatment Project is managed and operated by Bechtel BWXT Idaho. Bechtel BWXT Idaho safety initiatives during 2006 are summarized below. Noteworthy Advanced Mixed Waste Treatment Project safety accomplishments include:

- Completed and celebrated three years without a lost-time accident on December 7, 2006.

- Through the first three quarters, successfully lowered the collective Advanced Mixed Waste Treatment Project employee radiation exposure by 50 percent over the same period last year while performing the same level of radiological work by implementing new as-low-as-reasonably-achievable practices.

- Developed and received DOE approval of Advanced Mixed Waste Treatment Project safety performance objectives, measures, and commitment indicators for 2007. Leading indicator metrics were implemented in the safety performance objectives, measures, and commitments reports, including human performance indicators and employee involvement measures.

- Initiated a new Pollution Prevention Program, an Energy Conservation Awareness Program, and a Paper Recycling Program.

- The suite of permit modifications (three permits consolidated into two permits, with the final modification consolidating the remaining two into one soon to be submitted for approval) allows for consistency in environmental and waste management controls and efficiencies. These efficiencies allow for more effective and safe operations, both to personnel and the environment. In parallel, there was a reduction in arbitrary restrictions and requirements, providing more real-time operations flexibility and resulting in selection of the most effective and safe operations, which in turn increases safety for both personnel and the environment.

- Implemented the Advanced Mixed Waste Treatment Project Environmental Management System (EMS), ISO 14000-1 allowing for consistency in standardized and proven environmental and waste management controls and resulting in more effective and safe operations for both personnel and the environment.

Modification M135, effective May 1, 2006, extended the Bechtel BWXT Idaho management and operating contract for two years, through April 30, 2008, and provided for continued work necessary to meet settlement agreement milestones. This modification differed from Modification M116 in that it contained language as follows:

> "The contractor shall implement, using a graded approach, all List B requirements. A detailed schedule for implementation shall be issued to DOE-ID within one month of execution of this contract."

Implementation of List B requirements has been ongoing by Bechtel BWXT Idaho since June 2006, with a majority of activities completed by September 30. Bechtel BWXT Idaho continues to receive revisions to List B requirements from DOE. Impact analyses and schedules are developed in accordance with Bechtel BWXT Idaho procedures to ensure that implementation occurs as required.

The Advanced Mixed Waste Treatment Project ISMS Phase I was approved by the DOE on October 31, 2006. As noted in the following excerpts from DOE's *Advanced Mixed Waste Treatment Project Integrated Safety Management System Phase I Verification Report*, the quality of products and programs are reflected in the positive results and comments formally received from DOE's verification team:

- "Bechtel BWXT Idaho is commended for excellence in Phase I preparations, resulting in no Phase I verification report findings and five noteworthy practices."

- "Bechtel BWXT Idaho exerted an extraordinary effort to develop appropriate ISMS and prepare for the Phase I verification. The amount and quality of information provided to the verification team greatly facilitated the verification process."

- "The Phase I review team determined that Bechtel BWXT Idaho's ISMS description satisfied all ISMS Phase I objectives and criteria. No findings (deviations from requirements) were identified during the Phase I verification. A single observation regarding documentation of minimum qualifications for Control Account Managers was developed, along with nine opportunities for improvement. Five noteworthy practices were cited by the review team. Overall, the Bechtel BWXT Idaho ISMS description and supporting documentation were judged an excellent example of contractor commitment to Integrated Safety Management."

Implementation of DOE Rule, *10 CFR 851, Worker Safety and Health Program* requirements is nearing completion. The draft Worker Safety and Health Program and related Implementation Matrix are currently in review in preparation for submittal to DOE-ID for approval. Informal reviews by DOE-ID indicate that the draft Worker Safety and Health Program plan is on target to meet the intent of DOE Rule, *10 CFR 851, Worker Safety and Health Program*. Remaining actions and verifications that are related to DOE Rule, *10 CFR 851, Worker Safety and Health Program* requirements are being entered into a schedule to help ensure effective tracking and completion prior to enforcement actions that can begin February 9, 2007, followed by program approval and full implementation by May 25, 2007.

One element of DOE Rule, *10 CFR 851, Worker Safety and Health Program* includes the Beryllium Program. Program documents have been submitted to DOE and are awaiting final disposition. In support of this approval process, the Advanced Mixed Waste Treatment Project has taken the following additional steps:

- Coordinated effort with CH2M-WG Idaho and Battelle Energy Alliance to resolve remaining issues with the Chronic Beryllium Disease Prevention Plan for approval by DOE-ID.

- Conducted an independent assessment (annual review of Chronic Beryllium Disease Prevention Plan) with the Y-12 NNSA Bechtel BWXT Idaho Beryllium subject matter expert (SME).

An Advanced Mixed Waste Treatment Project Environmental Safety Security and Health team member was named to DOE's Beryllium Subcommittee.

The Conduct of Operations improvement process started in May 2005 with a comprehensive independent assessment to baseline the Advanced Mixed Waste Treatment Project program. This assessment was utilized to develop the Conduct of Operations improvement plan and resulted in the decision to take a two-phased approach. The first phase focused on the process and program improvement. This started with providing the necessary level of management and worker involvement and was accomplished by the formation of a Senior Conduct of Operations Council. This council provides a vehicle in which the operators and management develop, plan, improve, and institutionalize the Advanced Mixed Waste Treatment Project Conduct of Operations program. The next area was to ensure that the program properly implemented the order requirements and then moved on to increasing the workforce's level of knowledge of the "Why" behind Conduct of Operations. This was accomplished by providing technicians and their first-line management with training by an outside vendor (H.C. Howlett II). This training provides insights as to how Conduct of Operations is integral with everyday life and demonstrates how it provides a systematic approach to industrial operations. This training is ongoing, and currently additional classes are scheduled for spring of 2007. To date, approximately 60 percent of all operation personnel have attended, as well as numerous personnel from support organizations.

Phase II analyzes what worked and what did not from the Phase I improvement plan using a causal analysis methodology. The causal analysis was performed and is being used as a supplement to the original assessment. The Conduct of Operations improvements for the Phase II plan include:

- Development of metrics for Conduct of Operations performance

- Conduct of Operations Chapter Matrix and Assessment using a three-step approach

- Knowledge

- Reinforcement of Acceptable Behaviors

    - Application of knowledge
    - Reinforcement of acceptable behaviors
    - Operations oversight focused at line supervisor/worker interface
    - Drills
    - Mentoring (Senior Supervisory Watch)
    - Facilitated crew discussions led by Shift Manager/Shift Team Lead
    - Project notes
    - Crosswalk will feed the Phase II action list
    - Will require buy-in by Senior Conduct of Operations Council.

Additional actions were taken to augment the Conduct of Operations improvement plan. These included:

- Drill program

- Worker/supervisor interface oversight program

- Significant improvement to lockout/tagout process
- Issuance of command and control process
- Weekly Advanced Mixed Waste Treatment Project communications (i.e., project notes) on Conduct of Operations topic
- Development of two-tier procedure process.

The Advanced Mixed Waste Treatment Project's human performance improvement program has developed a coherent strategic approach to improving human performance in project operations, including institutionalizing the program (PD-ESH-03). In addition, the Advanced Mixed Waste Treatment Project has developed a human performance improvement five-year plan that will be revised as needed to reflect project needs. Other actions related to human performance improvement include:

- Personnel training to recognize the manageable elements of human performance. As of December 7, 2006, 185 employees have been trained.
- Alignment of the plant, the worker, and the organizational processes and values, and promoting organizational improvement by eliminating conditions that encourage human error and by reinforcing the value and defenses (e.g., use of Fact Finding Event Analysis).
- Facilitation of a structured mental framework that will enable employees to evaluate and communicate proactively to more readily identify flawed defenses, latent organizational weaknesses, and error-likely situations, as well as recognizing the potential consequences, and offering techniques to identify and eliminate flawed defenses and error-likely situations on the job site. (The Advanced Mixed Waste Treatment Project Employee Safety and Improvement Team Communication Committee is the main driving mechanism for this item.)
- Promotion of management commitment, and providing the infrastructure, environment, and tools necessary to enable the Advanced Mixed Waste Treatment Project to meet the above stated mission and goals.

Bechtel BWXT Idaho is proceeding with preparations for implementation of the Advanced Mixed Waste Treatment Project Contractor Assurance Program. They have completed and submitted a contractor assurance system program description and demonstrated feedback and improvement process criteria during the ISMS Phase I review.

A major focus area at the Advanced Mixed Waste Treatment Project has been on the mitigative controls for a hydrogen deflagration/explosion event. The hazards assessment process determined that the greatest risk for this event is during initial mechanical handling of a drum that has been in the retrieval area for 25-plus years. As part of the Advanced Mixed Waste Treatment Project's commitment to ISMS and hazards identification and mitigation, the Advanced Mixed Waste Treatment Project re-evaluated the drum handling controls in place to protect workers in the event of a drum deflagration event. As part of this review, the Advanced Mixed Waste Treatment Project identified and implemented the following actions to further protect the involved worker:

- Engineered physical barriers to be used during initial handling of drums
- Lid restraints for bulged drums
- Infrared screening of retrieval areas
- Administrative controls for handling drums requiring standoff distances during initial drum handling and body position restrictions during all drum handling
- Enhanced fire response with the strategic staging of magnesium oxide
- Development of detailed pre-incident plans.

These processes were developed and refined by Advanced Mixed Waste Treatment Project Operations staff through the use of walk-downs and full-scale mockup operations. The results of these evolutions were incorporated into processes, designs, and plans and institutionalized in Advanced Mixed Waste Treatment Project Operations instructions for waste handling activities and drum retrieval operations. In addition, Advanced Mixed Waste Treatment Project personnel were trained in the changes and requirements as well as the reasons behind the changes.

As a result of continuous improvement efforts, additional actions have been institutionalized and/or are under way to further enhance the safety posture of the workers. These include expanding the drum handling administrative controls for body positioning to all drums (vented and unvented), instituting the practice of venting all drums, and procuring a rapid port drum venting system. The institution of these enhanced controls has further increased the site's confidence in the protection of involved workers.

Bechtel BWXT Idaho actions taken in 2006 to support DOE implementation plans to address Board recommendations are as follows:

- Advanced Mixed Waste Treatment Project evaluation and reporting actions were completed with respect to Board Recommendation 2004-2. No active or passive ventilation system at the Advanced Mixed Waste Treatment Project is credited in the safety basis. To date, there are no further actions at the Advanced Mixed Waste Treatment Project to comply with Board Recommendation 2004-2.

Low Level Waste Operations

- The last revision to the Advanced Mixed Waste Treatment Project DSA (AMWTP-RPT-DSA-02) included incorporation of DOE-STD-1186-2004, *Specific Administrative Controls* requirements. Implementation of the DSA, including the training, completed all the actions necessary to fully comply with DOE-STD-1186-2004 and therefore to complete the Advanced Mixed Waste Treatment Project actions necessary pursuant to Board Recommendation 2002-3. Previously existing TSRs were evaluated for applicability, with a significant reduction in existing TSRs, plus the safety basis revision included the incorporation of three additional Specific Administrative Controls as there were operations in which personnel performed the equivalent of safety-significant functions.

- In direct response to Board Recommendation 95-2 and Board Recommendation 2004-1, the Advanced Mixed Waste Treatment Project was successfully approved regarding ISMS Phase I and participated in a DOE Headquarters assessment regarding nuclear safety. Actions from the assessment involving the safety basis, industrial safety/industrial hygiene, and fire protection programs were entered into the Advanced Mixed Waste Treatment Project corrective action tracking system.

- No findings (deviations from requirements) were identified during the Phase I verification. The review team noted a single observation, along with nine opportunities for improvement and five noteworthy practices. Requirements and improvements related to 2004-1 and 95-2 are not specifically delineated in Advanced Mixed Waste Treatment Project programs, but have been integrated throughout as an integral part of the Advanced Mixed Waste Treatment Project's Integrated Management System, which is described in the ISMS description document, SMS Description, AMWTP-PD-ISM-01, Rev.1.

- The Advanced Mixed Waste Treatment Project's main focus is continuous improvement through an active lessons-learned and feedback process. Some of the program tools include employee involvement through the Employee Safety and Improvement Team, the Keep Everyone and Yourself Safety behavioral based safety program, the pre- and post-job briefings, the Senior Supervisory Watch, and assessment programs. These processes are all elements of the Advanced Mixed Waste Treatment Project contractor assurance system that is currently under review by DOE-ID.

- The Vital Safety Systems (VSS) were officially documented and transmitted to DOE, and the system engineer program was implemented. The program includes the qualification needed for a System Engineer (phase 1 plan implementation) and a Cognizant System Engineer (phase II plan implementation). Currently, 14 System Engineers

and two Cognizant System Engineers are qualified. The Cognizant System Engineers, who oversee System Engineers, will be directly responsible for VSS and system design descriptions. The enhanced configuration management contribution will increase the surety of equipment operations and thus safety. This is the full intent for the program as promulgated from DOE Order 420.1B, *Facility Safety*.

- The successful shipment of the first 6,000 cubic meters of Advanced Mixed Waste Treatment Project TRU waste to WIPP, followed by nearly 5,000 additional cubic meters of TRU waste shipped to WIPP and approximately 730 cubic meters of mixed low-level waste shipped to Envirocare/Energy Solutions, has significantly provided risk reduction to satisfy Recommendation 2000-1. To date, a total of 14,465 cubic meters of the initial 65,000 cubic meters inventory (22 percent) has been shipped from Idaho for disposal. In concert with these shipments is the retrieval of boxes and drums into more stable storage and/or for treatment, further providing a risk reduction. Through continued processing, a total estimated 65,000 cubic meters of Advanced Mixed Waste Treatment Project waste will be shipped off site to complete the Advanced Mixed Waste Treatment Project risk reduction.

CH2M-WG Idaho Safety Initiatives

CH2M-WG Idaho successfully completed ISMS recertification. The ISMS Phase II Re-verification Review and contractor assurance system review was conducted by a 26-member DOE team, which noted two noteworthy practices, ten areas of strength, two findings, ten observations, and five opportunities for improvement.

The review team concluded that all aspects of ISMS as described in CH2M WG Idaho Program Description Document 1004, *Integrated Safety Management System*, have been implemented. The team also determined the CH2M-WG Idaho contractor assurance system as documented and implemented is compliant with DOE Order 226.1, I*mplementation of Department of Energy Oversight Policy*, requirements. Accordingly, the team recommended that the DOE-ID Manager approve CH2M-WG Idaho's ISMS and CH2M-WG Idaho's contractor assurance system as described and implemented.

The following is a status update of actions taken by the CH2M-WG Idaho Cleanup Project to support the Department's implementation plans to address Board recommendations:

- Board Recommendation 2004-2: All contractor actions are on or ahead of schedule. Deliverable 8.6.3 in the DOE implementation plan directs site offices to complete facility-specific evaluation reports and the Independent Review Panel to complete reviews for selected facilities based on any revised ventilation system evaluation guidance. Site offices will engage both the Independent Review Panel and the CTAs early in the evaluation process to ensure that the data collection tables properly specify applicable attributes for listed facilities based on the DSA assumptions. This engagement and consultation is to assure consistent application and specification across DOE sites. Site visits, conference calls, and status reports are appropriate between the site offices, the Independent Review Panel, and the CTA organizations during the evaluation process. The final evaluation reports must identify gaps and recommend actions for DOE field management disposition and approval.

- Board Recommendation 2002-3: All Idaho Cleanup Project facilities with an active mission and specific administrative controls have been modified to meet the requirements of DOE STD-1186. Additional changes implementing the most recent changes to DOE STD-3009 are expected to be completed in May 2007.

Major safety accomplishments include:

- Completed preliminary design of the Integrated Waste Treatment Unit for treatment of Idaho National Engineering Laboratory (INEL) Sodium-Bearing Waste. Process cell shielding and seismic protection were improved to address potential future mission options.

- Completed a comprehensive test program for the Integrated Waste Treatment Unit, using 1/10th scale pilot facility. The test program provided timely incorporation of equipment and process safety improvements into the preliminary design. Prepared and submitted all required documentation to support approval of Critical Decision 2 (Approve

Performance Baseline) for the Integrated Waste Treatment Unit.

- Upon receipt of a Waste Determination from the Secretary of Energy, initiated grouting of High Level Waste Tanks at the Idaho Nuclear Technology and Engineering Center. Grouting of three 30,000 gallon tanks was completed in 2006.

- Completed grouting of CPP 603 Spent Fuel Storage Basins at Idaho Nuclear Technology and Engineering Center.

- Continued wet-to-dry transfer of spent nuclear fuel, with a total of 954 units moved in 2006.

- Continued to disposition excess nuclear materials, with a total of 187 items dispositioned in 2006.

- Completed decontamination, decommissioning, and demolition of the Loss of Fluid Test reactor facility that had been designated as a "high risk facility."

- Completed decontamination, decommissioning and demolition of over 40 other structures, including: (1) four industrial buildings; (2) ten radiological buildings; and (3) one nuclear facility (in addition to Loss of Fluid Test).

Crew Preparing To Demolish the Loss of Fluid Test Reactor Facility

- Disposed of 7,402 cubic meters of CH and 69 cubic meters of RH LLW at the Subsurface Disposal Area at the RWMC.

- Retrieved and placed in safe storage 805 drums of buried TRU waste at the RWMC .

- Achieved 13 enforceable Voluntary Consent Order milestones on or ahead of schedule.

- Closed seven Voluntary Consent Order tank systems.

- Completed characterization of tank systems in accord with Voluntary Consent Order milestones, a culmination of a six-year effort involving over 700 tanks.

- Closed 29 release sites under CERCLA. This included the disposal of approximately 200,000 tons of contaminated soil, removal of over 1,000 feet of contaminated pipe and tank systems, and treatment of over 17,000 gallons of mixed waste.

- Obtained successful recertification of ISO 14001.

- DOE-ID and Naval Reactors-Idaho Branch approved a memorandum of agreement to transfer Naval spent fuel from the Idaho Nuclear Technology and Engineering Center to the Naval Reactor Facility.

- Obtained approval of sitewide Engineering Evaluation/Cost Analysis for decontamination and demolition activities under the Idaho Cleanup Project.

During 2006, DOE-ID and CH2M-WG Idaho supported numerous Board and staff reviews of activities being performed under the Idaho Cleanup Project, including:

- Spent Nuclear Fuel program

- Decontamination and demolition activities

- HLW tank grouting

- Accelerated Retrieval Project

Accelerated Retrieval Project Foundation Stabilization

Accelerated Retrieval Project 2 Construction

Accelerated Retrieval Project 2 Operations

- RH TRU project
- Integrated Waste Treatment Unit Project and pilot plant test program
- Authorization bases for specific facilities and projects
- ISMS implementation.

C. Livermore Site Office (LSO)

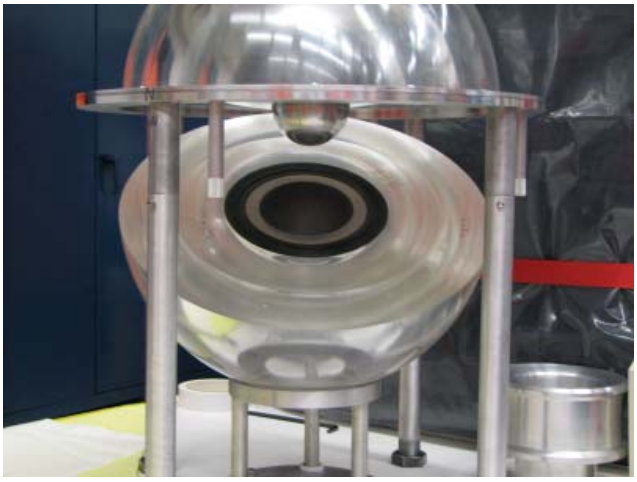
The Livermore Site Office (LSO) is located at LLNL in Livermore, California. Currently, the University of California is under contract with DOE for the management and operation of LLNL. LSO is responsible for administering this performance-based contract. Additionally, LSO promotes national nuclear safety, executes assigned NNSA and DOE programs, and conducts oversight of work performed by industrial contractors and grantees in support of NNSA and DOE requirements and priorities. Safety accomplishments and activities made at Livermore in 2006 are summarized in the following sections.

Activities Related to Implementation of Board Recommendations

During 2006, there was significant progress in implementing actions for completion of the following Board recommendations.

Implementation on actions associated with Board Recommendation 2000-2 included:

- Continued correspondence on progress made in implementing configuration management in the LLNL Nuclear Materials Technology Program. This included two letter responses to the NNSA Deputy Administrator for Defense Programs:
  - Letter dated November 13, 2006, Submission of an Updated Lawrence Livermore National Laboratory Configuration Management Resource-Loaded Schedule
  - Response to Request for information needed to close Board Recommendation 2000-2, provided on April 27, 2006.



LLNL Began Conducting a Criticality Safety Training Class for Criticality Safety Engineers in 2006 That Includes Hand-Stacking of Uranium Shells with Reflectors and Internal Moderation (Photo Credit: LLNL)

Two Students (Left and Center) Participate in Criticality Safety Training Class for Criticality Safety Engineers with the Assistance of an LLNL Fissile Material Handler (Photo Credit: LLNL)

Implementation on actions associated with Board Recommendation 2002-1 included:

- LLNL Software Quality Assurance implementation plan was developed and submitted to LSO. LSO approved it in July 2006.

- LLNL industry or consensus standard IEEE 1228 for safety software was submitted and approved in July 2006 by LSO.

Implementation on actions associated with Board Recommendation 2002-3 included:

- A portion of DOE-STD-1186-2004, *Specific Administrative Controls*, was added to the LLNL Work Smart Standards on June 22, 2006.

Implementation on actions associated with Board Recommendation 2004-1 included:

- Board Recommendation 2004-1 actions are being implemented. The feedback and improvement and activity-level work planning and control processes action plans are on schedule with the exception of Action 3a of the work planning and control processes action plan, Commitment 23 from LLNL.

Implementation on actions associated with Board Recommendation 2004-2 included:

- LSO contributed toward development of ventilation system evaluation guidance for safety-related and non-safety-related systems, deliverables for Commitments 8.5.4 and 8.7.

- LSO completed the LLNL listing of hazard category 3 defense nuclear facilities with an active confinement ventilation system as delineated in Commitment 8.4.

Implementation on actions associated with Board Recommendation 2005-1 included:

- Participated in weekly conference calls and offsite meetings

- LLNL provided technical input and review

- LLNL currently developing justification for proposed leak requirements on the storage package

- Provided inventory, packaging, and storage data

- LLNL developing a technical basis for their proposed packaging

- Participated in review of Nuclear Materials Packaging Manual.

Implementation on Actions Associated with Nuclear Criticality Safety

LSO approved and LLNL implemented a four-day nuclear criticality safety class that included hand-stacking of a subcritical assembly of highly enriched uranium. The class addresses a qualification requirement for nuclear criticality safety professionals.

LSO sent a letter to LLNL requiring a formal response to nuclear criticality safety recommendations highlighted in a letter from the Board dated October 11, 2006. The response due January 31, 2007 should address:

- Articulation of LLNL's policy statement on nuclear criticality safety
- Clear definition of continuing training for nuclear criticality safety engineers
- Assurance that oversight walkthroughs will include observations of actual fissile material activities to determine whether procedures are being followed
- Review of the roles and responsibilities of personnel with nuclear criticality safety duties to ensure proper integration
- Strengthening conduct of operations for nuclear criticality safety controls implementation
- Concerns from recent LLNL self-assessments
- Board concerns regarding the configuration management of the controlled materials accountability and tracking system.

Status of Building 332 Operations

Building 332 operations were limited by compensatory measures for most of FY 2006. On May 23, 2006, LSO approved full operation of Building 332 under the controls of the 2002 safety analysis report and TSRs. The approval was based on the satisfactory completion of a readiness assessment confirming the readiness of Building 332 personnel, procedures, and equipment related to the activities analyzed in the safety analysis report.

The status of Building 332 10 CFR 830-Compliant DSA and TSR is as follows:

- LSO issued its safety evaluation report on April 7, 2006, approving the Rule-compliant DSA and TSRs for the B332 Plutonium Facility. In February 2006, as LSO was completing its review process, several Board staff members visited LSO and LLNL to conclude their review of the B332 DSA and TSRs and provide feedback to LSO. LSO incorporated elements of this feedback into the April 7th safety evaluation report and its conditions of approval. The Board staff issued a report on their DSA/TSR review on April 12, 2006. In his May 10, 2006, letter to Ambassador Brooks, Board Chairman Eggenberger summarized the main findings of the Board staff review by stating that the DSA and TSR "collectively represent a significant improvement over the facility's currently implemented safety basis. The recently approved DSA and TSRs also adequately address deficiencies identified in previous versions of the documents which were communicated in the Board's letter of April 12, 2004. In this regard, the Board is particularly pleased that LLNL has renewed its commitment to a control strategy that includes robust, safety-class active confinement ventilation."

Machinist Bill Poulos, a Trained Fissile Material Handler, Weighs a Machined Plutonium Part in a Glovebox in the Plutonium Facility's Radioactive Materials Area. He Is Using a Certified Balance That Is Part of the Plutonium Accountability System. (Photo Credit: LLNL)

D. Los Alamos Site Office (LASO)

The Los Alamos Site Office (LASO) manages LANL, a multi-discipline National Laboratory with 27 nuclear facilities (11 of which are Nuclear Environmental Sites). For the first time in the Laboratory's history, the site contract was competitively bid. The DOE selected Los Alamos National Security, LLC, made up of a combination of the University of California, Bechtel, BWXT, and Washington Group. Los Alamos National Security, LLC combined the University of California's expertise in science and technology with Bechtel, BWXT, and Washington Group, a cadre of industrial partners, bringing expertise and strength to improve operations in support of accomplishing the missions of the Laboratory.

The Laboratory made progress toward meeting compliance requirements in the areas of operations, safety, security, and quality while continuing the history of outstanding mission performance that has resulted in the following operational and safety accomplishments during 2006.

Contract Transition

Laboratory operations were transitioned on June 1, 2006, through the award of a new operations and management contract with Los Alamos National Security, LLC. Transition activities included the successful movement of work scope, assets, and general site management responsibilities to the new contractor. The University of California and Los Alamos National Security, LLC were proactive in addressing issues, tracking costs and schedule milestones, and facilitating a smooth contract transition. University of California provided access to people, facilities, and processes for Los Alamos National Security, LLC to observe work and interface with the workforce, and it allowed Los Alamos National Security, LLC to make corporate judgments on pre-existing conditions. Los Alamos National Security, LLC facilitated communication with employees and kept employees informed of current transition status and issues affecting them through web sites, employee meetings, and regular e-mail updates. Los Alamos National Security, LLC transition activities ensured that as a corporation they understood operations at LANL, especially at the nuclear facilities/sites, and ensured that trained personnel were operating the facilities and that management was aware of areas requiring improvements.

Waste Checking of Drums During TA-18 De-inventory

LANL Technical Area (TA)-18's nuclear material de-inventorying process has continued to the point where this category 2 nuclear facility will soon be downgraded to a radiological facility.

Contractor Assurance System

Los Alamos National Security, LLC began transition activities in January 2006, taking over formal management and operations at the Laboratory on June 1, 2006. As part of the new contract, performance-based incentives were established that targeted several key safety, operational, and management systems.

Examples of performance-based incentives include:

- Shipping TRU waste to WIPP, including high-activity waste identified by the Board for expedited disposition
- Fire protection program improvements
- Safety basis program improvements

- Criticality safety program improvements
- Assessing and improving conduct of operations
- Electrical safety improvements
- Implementation of the contractor assurance system and the sharing of contractor assurance system data with LASO.

Activities Related to Board Correspondence and Recommendations

LASO is committed to implementing the Board's recommendations. The following is a summary of actions taken in 2006 to implement the Board's recommendations:

- LANL has implemented a comprehensive program for the stabilization of nuclear materials in response to Board Recommendations 94-1 and 2000-1. The plan is currently under revision, with a projected program completion date of the end of CY 2010. All Level 2 implementation plan and project execution plan milestones for the Board Recommendation 2000-1 materials stabilization project due at the end of CY 2006 have been completed.
- LANL has supported LASO's effort in implementation of Board Recommendation 2004-1. Los Alamos National Security, LLC is implementing a comprehensive, internal oversight and assurance system to improve performance and to supplement LASO's oversight role.

Workers Remove the 20+ Year-Old Caustic Tank at TA-50 Rad Liquid Waste Treatment Facility

- LANL has completed a complex analysis of the ventilation system at the PF-4 Plutonium Facility. This pilot study supports the implementation of Board Recommendation 2004-2 and provides comprehensive input to the development of DOE ventilation system standards for existing and future facilities.

Los Alamos Site Office Oversight of Los Alamos National Laboratory

On October 1, 2006, LASO began a two-year oversight pilot, as directed by the NNSA Administrator. The pilot oversight is to take full advantage of the contractor assurance system and utilize it fully for non-nuclear aspects of site operations while focusing LASO manpower on nuclear and security oversight. LASO worked closely with Los Alamos National Security, LLC during contract transition to ensure that the contractor assurance system was robustly implemented and allowed LASO to focus attention on nuclear and security oversight. The Albuquerque Service Center continues to provide key support in oversight of nuclear aspects of the Laboratory, contributing SMEs in the areas of criticality safety, safety basis reviews, and VSS engineering, as well as other areas. In addition, they are providing key support to ensure that the Laboratory is properly implementing DOE Rule, 10 CFR 851, Worker Safety and Health Program.

Caustic Tank at TA-50 Transferred to TA-55 Area G for Disposition

During 2006, LASO/NNSA independently assessed LANL's approaches and actions for the criticality safety program and provided LANL additional guidance. Similarly, LASO reviewed LANL's fire protection program and provided guidance to LANL and feedback to the Board. LASO also completed a verification of

LANL's maintenance and inspection procedures for the Pajarito flood retention structure and ensured that the Board's concerns were addressed.

E. Nevada Site Office (NSO)

The Nevada Site Office (NSO) maintains the capability at the NTS and other facilities and sites to implement DOE initiatives in stockpile stewardship, crisis management, waste management, environmental management, non-defense research and development, and work for others, as well as supporting other DOE programs.

During 2006, NNSA and NSO conducted a series of safety basis reviews, assessments, and readiness reviews as part of the successful execution of two major subcritical experiments (Krakatau and Unicorn) by LANL at the NTS. NSO reviewed and approved the DSA and TSR developed by LANL for each of the subcritical experiments. NSO and LANL each conducted management self-assessments and other assessments (e.g., QA, configuration management, unreviewed safety question process, startup process) as part of the preparation efforts. NNSA and LANL independently conducted ORRs at the Device Assembly Facility (DAF) for subcritical assembly, radiography, and downdraft table operations needed to support Krakatau and Unicorn. NNSA and LANL independently conducted readiness assessments for the remainder of operations associated with each experiment.

NSO initiated a comprehensive set of assessments at the DAF to determine the level of compliance and performance of safety management programs and vital safety systems. Thirteen Safety Management Program functional areas were assessed with respect to adequacy of flow-down and performance. Vital safety system assessments included both passive and active safety-class and safety-significant systems. Other defense-in-depth structures, systems, and components at DAF will be assessed in 2007.

NNSA proceeded with detailed design and initial construction of the critical experiments facility at the NTS. The critical experiments facility project involves relocation of four critical assembly machines (Planet, Comet, Flattop, and Godiva) previously operated at LANL in TA-18 to the DAF. NSO approved a preliminary DSA for the critical experiments facility developed by LANL and LLNL to support initiation of construction.

Safety improvements completed at the DAF include:

- Covers for control boxes were installed on the uninterruptible power supply system.
- Low-flammability oil was used to replace the existing transformer oil.
- Engineering work for expansion joint repairs was completed, and engineering options for a roofing system/cover were developed.
- Upgrades were initiated to the DAF probabilistic seismic hazard analysis and structural response evaluation.

A Water Leak Repair and Crack Monitoring Evaluation Plan was developed and implemented. An expert assessment of the concrete cracking problems at the DAF was performed and provided to the Board. The assessment concluded that the cracking was due to shrinkage, with negligible effect on the capacity of the structure.

Consolidation and Stabilization of Nuclear Materials

The DAF at the NTS was used to support the NNSA offsite source recovery program. Radioactive sources returned by previous users and sites were temporarily stored at the DAF until LANL facilities could accommodate receipt for processing and disposition.

The Device Assembly Facility (DAF) at the NTS Was Used to Support the NNSA Off-Site Recovery Program (OSRP)

Additional shipments of nuclear materials from LANL TA-18 were received and staged at the DAF. The nuclear materials stem from the critical assembly machines previously used at TA-18 to conduct basic research and practical, hands-on criticality safety

experience for technical personnel throughout the national and international community.

Environmental Management

The Low-Level/Mixed Low-Level Waste Project facilities located in Area 5 of the NTS provide disposal services for onsite and offsite DOE generators. The project accepted and disposed of 1.17 million cubic feet of LLW and 6.5 thousand cubic feet of mixed LLW in FY 2006.

Glovebox Burial. The Low-Level/Mixed Low-Level Waste (LLW/MLLW) Project Facilities Located in Area 5 of NTS Provide Disposal Services for On-Site and Off-Site DOE Generators

The Transuranic/Mixed Transuranic Project is a non-reactor nuclear facility responsible for characterization of legacy TRU waste, also located within Area 5 of the NTS. During FY 2006, 44 cubic meters of legacy TRU waste were sent to the WIPP in drums. The glovebox previously used in the Area 5 Visual Examination and Repackaging Building to characterize the TRU waste was removed and disposed of on site.

Glovebox Removed. The Glovebox Previously Used in the Area 5 Visual Examination and Repackaging Building to Characterize the TRU Waste Was Removed and Disposed of On Site

F. Oak Ridge Operations Office (OR)

The U.S. Department of Energy's Oak Ridge Operations Office (OR) is responsible for major DOE science, technology, and environmental management programs. Safety accomplishments and activities at Oak Ridge facilities are provided in the following sections.

Oak Ridge National Laboratory Melton Valley Closure Project

The ORNL Melton Valley project completed the Cask Loading Station spent nuclear fuel retrieval, packaging, and shipment to INL and downgraded the Category 2 safety basis document to a "less than Category 3" (less than detectable radioactive contamination) end state awaiting the EPA Interim Record of Decision approved land use assignment.

CD-4 TRU Trenches

Category 3 quantities of liquid wastes in tanks T1 and T2 and the High Flux Isotope Reactor tanks have been removed and sent to treatment, and residual heels were stabilized in place (grouted). The safety basis has been revised to a final hazard categorization of less than Category 3 by "form" to allow below-grade soil site intrusive remediation that did not involve the tanks (Soils and Sediments project below). The proposed end state categorization of the T1 and T2 sites is an Inactive Waste Site.

Another Melton Valley project, the Transuranic Retrieval project, completed the retrieval of all 204 of the legacy casks in the 22 Trench Burial Site. The site is still a Category 3 site due to pyrophoric waste in legacy drums that was found in Burial Site 13 at the site. The In Situ Grout project stabilized in place wastes that were greater than Category 2 and passed the hydraulic conductivity test required by the EPA interim record of decision determining successful isolation of the wastes. The In Situ Grout project also isolated the seven homogenous reactor experiment fuel wells containing greater than exempt quantities of solution fuel. The In Situ Grout project end state safety basis is a less than Category 3 categorization document until the aerial density of the reactor fuel in a soil matrix can be shown to be "criticality incredible" for the homogenous reactor experiment fuel wells.

The Melton Valley Hydraulic Isolation project isolated, capped, cleaned, or otherwise stabilized greater than 140 acres of waste sites in Melton Valley; isolated and abandoned between 900 – 1000 wells/injection sites; and completed decontamination and demolition of multiple minor structures. The end state safety basis for Melton Valley Hydraulic Isolation work is a less than Category 3 general surveillance and maintenance document that covers the majority of the Melton Valley acreage covering multiple projects and allows EPA interim record of decision approved land use assignments. The Facility decontamination and demolition project under Melton Valley completed structure decontamination and demolition of the homogenous reactor experiment evaporator and multiple ancillary structures, the new Hydrofracture facility and multiple other facilities. The end state safety basis for the previous facility footprints was incorporated under the general Melton Valley surveillance and maintenance less than Category 3 safety basis. The Soils and Sediments project remediated over 40 spill/leak/contamination sites including isolating/grouting over 6 miles of inactive buried waste lines. The general Melton Valley surveillance and maintenance less than Category 3 safety basis represents the end state safety basis for the project.

TRU Trenches Waste Retrieval Project

Significant Environmental Management Accomplishments

CH TRU waste processing activities began for preparation of waste for disposal at the WIPP. The TRU Waste Processing Facility began characterization evaluations, screening, and repackaging of CH TRU waste in December 2005 and has prepared over 300 containers for final waste certification for disposal. Work was done with the CBFO to incorporate the WIPP Central Characterization Program into the project for performing final waste certification activities.

The TRU Waste Processing contract with Foster Wheeler Environmental Corporation was successfully renegotiated, converting the former fixed-priced contract to a cost plus fixed fee contract, which is more appropriate for the work being conducted. Coupled with the contract conversion was settlement of four major Requests for Equitable Adjustment from the fixed-price contract.

Readiness activities were completed, and operations to vent and sample drums of stored legacy CH TRU waste were initiated. Operations began to remove drums of CH TRU waste from storage, insert filtered vents and sample ports into the drums, and perform analysis of head-space gases for hydrogen and volatile organics prior to shipment of the drums to the TRU Waste Processing Center for waste certification.

Board Recommendation 97-1, *Safe Storage of Uranium-233*

In June 2002, the Department issued Request for Proposal No. DE-RP05-00OR22860, Uranium-233 Disposition Medical Isotope Production, and Building 3019 Complex Shutdown to process the U-233 in Building 3019 to eliminate criticality and proliferation concerns through downblending, to extract thorium-229, and to remove the U-233 so that the 3019 Complex can be deactivated. In October 2003, the contract was awarded to Isotek Systems, LLC, a consortium of Duratek Federal Services, Inc., Burns and Roe

Enterprises, Inc., and Nuclear Fuel Services, Inc. The base contract award is for Phase I, Planning and Design, with options for Phase II, Project Implementation, and Phase III, Building 3019 Complex Shutdown, being unilaterally exercised by the Department.

In November 2005, Congress directed the DOE to promptly terminate the Medical Isotope Production and Building 3019 Complex Shutdown project at ORNL. Congress also directed that responsibility for disposition of the U-233 be transferred to the Defense EM program per DOE's recommendation, and provided resources for the disposition of the material stored in Building 3019. Preparation for transition and redesign activities for parts of the process by eliminating extraction of thorium-229 to ensure operability and maintainability of the process continues. The ORNL management and operating contractor continues responsibility of building operations. Transfer of the facility operation to the selected contractor, Isotek Systems, LLC, is pending a final approval of a critical decision 2/3a determination for the project.

During FY 2006, activities centered on redesigning the process to accommodate the impact of leaving thorium-229 in the downblended material, verifying that there is a means to disposition the downblended material, and establishing a revised cost and schedule for the project. The contractor, Isotek Systems, LLC, prepared preliminary design for the affected parts of the design, and revised the cost estimate and established a schedule for disposition based on the chemical and radiological characteristics and projected disposal site capability to handle the RH TRU material. In July and August, the Office of Engineering and Construction Management conducted an external independent review of the revised project and, after review of the corrective actions, the Office of Engineering and Construction Management validated the performance baseline of $379.2M and the completion date of December 2020. In the last quarter, EM initiated National Environmental Policy Act (NEPA) documentation and prepared revised project documentation for project authorization during the first quarter of FY 2007. A Project Director was selected and the Integrated Project Team assembled. Preparations for the transfer of the building operations to the control of Isotek Systems, LLC was delayed due to uncertainties with funding and the schedule for project authorization for Phase II of the planned project. Work proceeded during the year to put into place the required agreements necessary for Isotek Systems, LLC to operate the facility. These agreements included provisions for the supply of utilities, fire protection, and security for the facility. In addition, Isotek Systems, LLC has planned to use existing employees to insure a smooth transition in facility operation. During the year, there was a successful changeout of high-efficiency particulate air filters (HEPA) on a major building exhaust system, security enhancements were made to the facility, and the facility staff maintained proficiency for the movement of nuclear materials within the building.

Integrated Safety Management System

In 2006, OR performed several effectiveness reviews of closed corrective actions from self-assessments and independent assessments that were performed in 2005.

Three Million Safe Work Hours. Bechtel Jacobs Company, LLC worked from January 4, 2006, to July 25, 2006, without a lost workday away case. This represents a significant milestone in safety performance with 2.9 million hours on the Accelerated Clean-up Project and over 3.3 million hours for Bechtel Jacobs Company, LLC without a lost workday away case. This translates to over six months without an injury severe enough to prevent someone from coming to work.

ISMS Metrics. During FY 2006, Bechtel Jacobs Company, LLC provided ISMS performance metric information to OR. The reporting included metrics on the following areas: environmental protection, industrial safety and health, radiation protection, nuclear safety, fire protection, authorization basis, security, and transportation management. This trend information is provided to DOE on a monthly basis.

Development of the Work Control Alignment Workshop. In conjunction with Bechtel Corporate, ES&H developed a workshop focused on determining the alignment of project personnel on key issues related to work control and safe execution of work. The workshop also provided tools to help improve alignment within the planning and execution team. Twelve workshop sessions were conducted with over 350 management, supervision, and craft personnel attending.

Work Control Process Changes. Bechtel Jacobs Company, LLC performed a re-evaluation of the work control process and developed a complete revision to the Bechtel Jacobs Company, LLC work control procedure. The new procedure became a requirement for all projects and was flowed down to all Bechtel Jacobs Company, LLC subcontractors. Some of the enhancements include:

- Establishing single line accountability on a project for work package preparation
- Establishing single line accountability for work execution
- Instituting a required Project Team (workers, technical experts, supervision, facility management) approach to work package development in order to generate better integrated packages
- Requiring technical, supervision, and worker input during the planning walkdown
- Including workers as part of the team even to the point of work package signoff
- Establishing a Work Control Task Lead position for each work package to ensure clear ownership of the work package during implementation.

Work Control Procedure Training. Over 2,100 Bechtel Jacobs Company, LLC and subcontractor management, technical, supervisory, and craft personnel were trained as a part of the work control improvement initiative and rollout of the new revision of the work control procedure. Safety leadership and human performance improvement elements were major components of this training.

Safety Task Analysis Risk Reduction Talk Card Revision. A series of working interface sessions with craft, supervision, and Field Services to revise Safety Task Analysis Risk Reduction Talk Cards were conducted. In addition to feedback and improvements recommended by craft, human performance improvement elements were incorporated into the cards, with an emphasis on those related to error precursors. Rollout training was developed and given across the project. The implementation date for the new cards was October 1, 2006.

Post-Holiday Safety Stand-downs. Bechtel Jacobs Company, LLC implemented post-holiday safety stand-downs upon return to work from both major holidays during this period. ES&H and Field Services have developed stand-down materials targeted at refocusing people on work, reviewing specific tasks and hazards, and identifying changed conditions following each major holiday this year.

Completion of the Accelerated Cleanup Project-wide Safety Perception Survey. More than 1,000 Bechtel Jacobs Company, LLC and subcontractor employees completed the online survey, and 800 Bechtel Jacobs Company, LLC and subcontractor employees who do not have computer access completed paper copies of the survey. The data was tabulated and analyzed independently by DuPont Safety Resources, and shared across the project. A number of follow-up actions have been completed to address the issues identified by the survey.

Human Performance Training. Bechtel Jacobs Company, LLC conducted human performance fundamentals training to support the implementation of human performance elements of the work control process. Over 120 people were trained, including senior managers, supervisors, functional support personnel, and workers.

Full Participation Exercise. The East Tennessee Technology Park (ETTP) planned and conducted a site full participation exercise. Participants in planning and conduct of the exercise included Bechtel Jacobs Company, LLC, DOE, state, and local county/city governments. The exercise was designed to evaluate the site's readiness to respond effectively to a site emergency and to successfully integrate the site's response with offsite agencies.

National Incident Management System Implementation. Bechtel Jacobs Company, LLC completed actions to adopt the National Incident Management System as required by Homeland Security Presidential Directive 5 at ETTP. Implementation included the revision of emergency plans and procedures, and the completion of National Incident Management System training by the site emergency response organization.

TRU Waste Drum Preparation. Approximately 3,900 drums of legacy TRU waste are in storage at ORNL. Before the drums are moved to the processing facility, vents and sample ports must be installed and headspace gas sampling conducted. The safety basis document for the storage of the waste was upgraded to perform this activity in existing portable trailers. Lessons learned were incorporated into the process development and safety analysis from other DOE operations. The Board was briefed on several occasions, with no follow-on issues. To date, 172 drums have been safely processed.

Bechtel Jacobs Company, LLC Nuclear Criticality Safety Program Accomplishment. The Bechtel Jacobs Company, LLC Nuclear Criticality Safety Program has produced an approved criticality incredibility analysis that establishes the criteria to be met prior to demolition of the first section of the K-25 Building. Bechtel Jacobs Company, LLC Nuclear

Criticality Safety personnel are intimately involved with the project characterization efforts that are necessary in order to implement the approved analysis. In addition to this significant effort, the Bechtel Jacobs Company, LLC Nuclear Criticality Safety Program supported decontamination and decommissioning of the K-1420 facility. That building has now been safely demolished, and the resulting debris pile is now being containerized and shipped off site. In other areas, Nuclear Criticality Safety has been focused on analysis of disposal of K-25 process gas equipment and piping at the Environmental Management Waste Management Facility disposal cell, safe resumption of Molten Salt Reactor Experiment fuel salt removal activities, and successful resolution of legacy discoveries, such as the unidentified casks found in the K-770 scrap yard.

UF_6 Cylinder Yards at ETTP. As of December 1, 2006, 5,813 full depleted uranium hexafluoride (DUF6) cylinders have been safely shipped from ETTP to Portsmouth, Ohio, with less than 200 cylinders remaining to be shipped. One additional ETTP cylinder yard was emptied, bringing the total to four of the six at the site that have been emptied of DUF6 cylinders, and one additional cylinder yard has been formally closed, bringing the total to three of the six at the site.

K-1420 Building at ETTP. Building K-1420 at ETTP was a uranium recovery and decontamination facility for process components used in the gaseous diffusion process at the site. Part of the residual contamination was removed by a former DOE contractor, and Bechtel Jacobs Company, LLC was requested to assume responsibility for removing the remaining inventory and demolishing the building. Removal of the last remaining inventory was completed and the building was demolished in FY 2006.

ETTP Building K-1401. Currently under the ETTP decontamination and demolition scope, Building K-1401 is being demolished in a phased approach. The preparatory work prior to demolition has been completed and included waste characterization, evaluation of disposal options, and management of various types of waste material, in compliance with regulatory, security, and contractual requirements. Also, work activities in the basement area of Building K-1401 include removal of process piping and equipment prior to demolition. The plan is to demolish the building in three sections following completion of various contamination and waste cleanup and removal and structural evaluation for safety purposes. Demolition of Building K-1401 started at the south side, considering requirements of the collapse plan and site access and traffic. Of the three sections targeted for demolition, totaling approximately 400,000 square feet, approximately 100,200 square feet, or about 26 percent, has been completed. The plan is to complete demolition of the above-grade building and the basement section by about the end of May 2007, and complete generated material shipment and disposal by about mid-July 2007.

ETTP Metal Project. Project totals as of December 1, 2006, are 4,185 shipments and 92,398,190 pounds (46,199 tons) shipped to the Environmental Management Waste Management Facility. The scrap metal project is 98.5 percent complete.

Southeast Corner of the K-29 Building

ETTP Building K-29. The K-29 Building was part of a series of mammoth buildings to enrich uranium for weapons and fuel for nuclear power plants. The building went into operation in 1951 and was shut down in 1987. The building is 524 feet by 560 feet and is composed of two floors of approximately 290,000 square feet each. This size equates to 6½ football fields under a single roof. A great deal of planning, preparation, and training went into this process so that demolition would be done safely and with minimum risk to workers and the environment. The demolition of K-29 building was completed on July 8, 2006.

K-25/K-27 Decontamination and Decommissioning Project. The K-25/K-27 Buildings were two of the original gaseous diffusion facilities for isotopic enrichment of uranium from the late 1940s to the early 1960s. The K-25 Building has a footprint of approximately 1,637,000 square feet and is located at the center of ETTP. The K-27 Building is a rectangular building located southwest of the K-25 Building with a footprint of approximately 374,000 square feet. The scope of the project is to remove all process and non-process equipment, demolish both buildings, and disposition the equipment, material, and debris. The DSA Revision 3C and TSR Revision 3D

K-25 Compressor Removal

were approved on July 5, 2005, and Revision 4 documents have been revised and are currently under review by DOE. The ORR of the K-25/K-27 High Risk Equipment and Other Process Gas Equipment Removal Report Date was November 2005. The Notice to Proceed was issued on December 16, 2005. The first high risk equipment compressor removal, segmentation, and mining was completed on October 26, 2006, and the second high risk equipment item was completed on December 11, 2006. During FY 2006, a new plan for demolishing the K-25 and K-27 Buildings was developed that will better protect workers from the deteriorated conditions in the buildings by reducing the number of workers and hours in the buildings. The new plan involves removing high-risk components, unbolting and removing motors and compressors, and then demolishing the buildings from the outside utilizing heavy equipment.

Currently the project is in the process of executing numerous activities leading to the start of the demolition of the K-25 Building West Wing in FY 2007. Ongoing activities during 2006 included: design, procurement, and construction of new Non-Destructive Assay and Segmentation Shops outside of the K-25 Building; characterization sampling; cell housing and pipe ductwork removal and disposal; vent, purge, drain, and visual inspection of process piping and equipment; process equipment and piping stabilization (foaming); asbestos abatement; transite removal; and design, procurement, and construction of a new criticality detection system. The project has shipped over 2,545 truckloads of LLW from the site for disposal, including 365 items of process and non-process equipment from the buildings.

High Risk Equipment Compressor Seal Exhaust Lines are Cut and Isolated

Vent/Purge/Drain Activities in K-25 Building

G. Office of River Protection (ORP)

The DOE Office of River Protection's (ORP) mission is to retrieve and treat Hanford's tank waste and close the tank farms to protect the Columbia River. The chemical and radioactive waste is currently stored in 177 large underground tanks. ORP and its tank farms contractor, CH2M HILL Hanford Group, Inc., are removing and transferring this waste from the older 149 single-shell tanks (SSTs) to the newer 28 double-shell tanks (DSTs), to reduce the environmental risk posed by the older tanks. The cornerstone of the tank waste cleanup project at Hanford is the WTP Project. The WTP will use a proven technology, called vitrification, to immobilize chemical and radioactive waste in an exceptionally sturdy form of glass to isolate it from the environment.

Aerial View of WTP Site

Waste Treatment and Immobilization Plant Project

Status of Construction

WTP site construction forces have installed approximately 165,000 cubic yards of concrete; 8,500 tons of structural steel; 500,000 pounds of heating, ventilation, and air conditioning (HVAC) duct; and 176,000 linear feet of cable and wire. Table 4.A displays the project design, procurement, and construction status of each of the five WTP facilities at the end of FY 2006. The percentages are based on the performance measurement baseline (without contingency) that was provided in the May 2006 estimate at completion.

Primarily due to concerns about seismic design criteria for the facility resulting from identification of sedimentary interbeds with the basalt framework, construction of the High-Level Waste and Pretreatment facilities was curtailed in FY 2005. In 2005, the Department increased the ground motion for seismic design by 40 percent to bound the site response uncertainties in ground motions. The Department subsequently incorporated this revised ground motion in the structural design criteria for the WTP. As a result of the ongoing revised ground motion analyses, project construction emphasis was shifted to the Low Activity Waste Facility, the Analytical Laboratory, and the Balance of Facilities, since these facilities are seismic category III and were not affected by the revised ground motion analyses. Key accomplishments in these areas are as follows:

- The key accomplishments for the Low Activity Waste Facility were the completion of the main facility siding and roof, and the placement of the off-gas stack. Structural work has essentially been completed for the main building, and future work will concentrate on equipment installation within the facility and completion of the ancillary structures such as the Load-Out Bay.

- For the Analytical Laboratory Facility, the concrete basemat has been completed, and the layout for the erection of the structural steel has begun.

- For the Balance of Facilities, construction is essentially complete on the main switchgear building, Balance of Facilities switchgear building, cooling tower, steam plant, four pump houses and associated tanks, and four tanks associated with the water treatment facility. Additionally,

Table 4.A – Status of WTP Completion by Facility

FACILITIES	DESIGN (hours)	PROCUREMENT (dollars)	CONSTRUCTION (hours)
Low-Activity Waste	93%	61%	48%
Analytical Lab	88%	29%	34%
Balance of Facilities	87%	40%	47%
High-Level Waste	79%	39%	20%
Pretreatment	70%	40%	25%
Total WTP Completion Status	78%	43%	29%

Note: The percent complete by facility for procurement and construction include an allocation of plant-wide (common) engineering, procurement, construction, and commissioning costs.

construction of the Chiller Compressor Building has achieved substantial progress, and the majority of the underground piping and underground conduit associated with Balance of Facilities has been installed.

WTP Fiscal Year 2007 Begins

As noted above, with minor exceptions, construction of the Pretreatment Facility was suspended pending completion of the reevaluation of the seismic ground motion analysis for the facility, equipment, and components. Fabrication of some equipment and components and other procurement activities continued. For example, fabrication of the two largest cranes for the facility was nearing completion at the end of FY 2006. Also, testing of the evaporator support frames has been started to verify the acceptability of the fabrication material.

Prepping Roof on Low Activity Waste Facility

Construction was similarly suspended for the High-Level Waste Facility due to the reevaluation of the seismic ground motion analysis. For this facility, procurement activities continue with a number of key facility components received on site, including the wet electrostatic precipitator and the canister decontamination equipment.

WTP Project Cost, Schedule, and Baseline Revisions

On December 22, 2006, the Department's Secretarial Acquisition Executive approved a revised baseline at a cost of $12.26 billion, and the project has already been appropriated $3.64 billion for design and construction. The revised baseline assumes consistent Congressional appropriations of $690 million from FY 2007 through construction and commissioning completion. Additional details of the technical, cost, schedule, and management reviews, which were accomplished leading to the rebaseline, are outlined in the Department's Fiscal Year 2008 Congressional Budget Request.

Setting of Low Activity Waste Facility Stack

Authorization Basis

The most important Authorization Basis activity completed in 2006 was the submittal and subsequent approval of the 2006 update to the Preliminary Safety Analysis Report for the WTP Project. The Preliminary Safety Analysis Report was submitted in March 2006, and final approval was granted in August 2006. In addition, of the 55 conditions of acceptance generated in the previous revision review, 21 were closed. An additional condition of acceptance was developed to ensure that construction is not performed in areas that do not have an adequate safety analysis. This revision included an update of Important-to-Safety classifications to be consistent with DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*.

Twenty Authorization Basis amendment requests were approved in FY 2006. The significant changes

affected plant-wide requirements as well as facility-specific analyses. Changes were approved involving the tailoring, addition, and revision of several safety requirements document implementing codes and standards, including American Concrete Institutes 349-2001, DOE-STD-1020-94 references, National Fire Protection Association 69, 29 CFR 1910.119, 40 CFR 68, and Nuclear Regulatory Commission Regulatory Guide 1.194. Other general changes included establishing inelastic energy absorption factors for the design of piping and pipe supports and structures, systems, and components, and implementation of DOE-STD-3009-94 requirements into the analysis of off-gas release and fire events.

WTP Marshalling Yard

Oversight of the WTP Project Construction Programs

In 2006, ORP continued its integrated oversight program of WTP design and construction activities. Nine engineering design reviews were performed in such areas as the auto sampling system, configuration management, hydrogen generation rates, and tank utilization. Findings that indicated the contractor was not meeting contract or regulatory requirements were identified and will be tracked to closure by ORP. Also, six reviews of the as-constructed facility were conducted to verify compliance with the Resource Conservation and Recovery Act permit. Oversight of WTP construction included about 250 documented onsite construction inspections and 10 offsite supplier inspections. In addition, WTP performed about 40 WTP construction assessments of various contract-required quality, safety, and oversight program activities. These oversight activities identified strengths and weaknesses in engineering design, construction processes, and personnel safety, in addition to several code and/or contract non-compliance issues. Most inspections identified acceptable performance. ORP oversight personnel identified deficiencies in the areas of quality and weld program implementation by suppliers, implementation of the construction confined-space program, and electrical support acceptance documentation. The primary contractor, Bechtel National Inc., has taken actions to address these and other identified issues. For example, Bechtel National Inc. has improved the supplier oversight program to ensure that oversight includes substantial review of suppliers' quality and weld program and implementation reviews. ORP continues to independently verify the adequacy of Bechtel National Inc. corrective actions.

In August 2006, Bechtel National Inc. submitted its FY 2007 ISMS Declaration of Readiness. Based on the project status and ISMS programs in place, no revision was made to the ISMS Description. The most significant commitment of the readiness declaration was Bechtel National Inc. continued use of the Nuclear Safety and Quality Imperative Project on the WTP Project. The Imperative Project is designed to address quality weakness and to address improvement opportunities, such as mitigating inconsistencies in quality levels and design and authorization basis documents, continued use of the Friday/Safety Leadership Development Series training class, upgrading and revising the Job Hazards Analysis procedure, and obtaining Voluntary Protection Program STAR status at the construction site. In addition, Bechtel National Inc. made changes to the programs implementing ISMS, including establishing a separate organization to independently review and control hazardous energy work, implementing human performance improvement techniques to identify and understand latent organizational weaknesses, and establishing a new project-level training advisory board. Based on project documentation review and field observations, ORP determined that the Bechtel National Inc. ISMS is implemented and effective.

In late 2005, the Office of Enforcement conducted a Price-Anderson Amendments Act investigation into inconsistencies involving design documents and the authorization basis deficiencies in black cell vessel non-destructive examination requirements, quality level inconsistencies, and structural steel design deficiencies. The investigation summary report, issued in January 2006, concluded that violations of DOE nuclear safety requirements of 10 CFR 830 Subpart A had occurred. In March 2006, a Preliminary Notice of Violation was issued that included a civil penalty of $198,000. In April 2006, Bechtel National Inc. responded and provided a detailed list of corrective

actions, the bulk of which were captured in the Nuclear Safety and Quality Imperative Project. ORP continues to monitor Bechtel National Inc. implementation of the corrective actions.

In August 2006, the Office of Enforcement notified Bechtel National Inc. of its decision to conduct an investigation into deficiencies in the application of as-low-as-reasonably-achievable requirements in facility design, the review and approval of supplier submittals, and the application of the commercial grade dedication process. An onsite investigation will be held in December, and a final report is expected in early 2007.

ORP continued its efforts to improve the safety culture and oversight capability of its staff. For example, a one-day Human Performance Improvement class was taken by all staff, along with a hands-on practical exercise provided by a WTP Facility Representative. Also, all WTP personnel will have attended a four-day Human Performance Improvement class by mid-2007. Staff qualification efforts continued, with qualification of all Safety System Oversight and Facility Area Engineer personnel expected in 2007. In addition, a WTP-specific qualification program has been developed for project Facility Representatives, with qualification of all the Facility Representatives expected in 2007.

Mockup Training To Remove Slurry Distribution in Tank AY-102 and To Install a Waste Transfer Pump

WTP Project Implementation of Revised Ground Motion

In 2005, the structural design criteria were revised to incorporate the revised ground motion spectra at the WTP, and the revised seismic analyses of the facility structures were completed. In 2006, the project began implementing the structural design criteria for the detailed design of the facility concrete and steel structures, equipment, components, and piping. Concrete design calculations have been standardized to improve efficiency. Reanalysis of the concrete structures performed thus far resulted in no need for modifications of facilities already built. Existing equipment and components that had been designed but not built were either verified to be acceptable for the new criteria or redesigned to meet the new criteria. Also, Bechtel National Inc. submitted revised procurement specifications to the vendors for the design and fabrication of vessels and other equipment. Some design modifications to vessels and piping have resulted from the specification changes.

Two independent reviews of the implementation of the design criteria associated with the revised ground motion were performed in 2006. The DOE Peer Review Team continued its oversight activities of the design of structures, equipment, and components. In addition, the U.S. Army Corps of Engineers (USACE) began reviews of the design criteria, design process, and the detailed design of the facility, structures, systems, and components. The Peer Review Team review included review of the analytical and design calculations utilizing the refined mesh finite element models, the structural analytical models, concrete design, embedment calculations, and the dynamic analysis of the design of the buildings, vessels, equipment, piping, and other distribution systems. Overall, the facility design was considered acceptable by the Peer Review Team; however, a number of comments or issues were identified to Bechtel National Inc. for resolution. Bechtel National Inc. is in the process of resolving these open items. Similarly, the USACE performed reviews of the soil-structure interaction analysis, the load path analysis for the High-Level Waste and Pretreatment facilities, the structural analytical models, concrete design, embedment calculations, and equipment and piping design. In October, the USACE completed its review and noted that the revised seismic design and analysis were in compliance with applicable codes and

standards. The comments and recommendations from this review are being addressed by the project, with resolution expected in 2007. The USACE reviews are expected to continue as design efforts proceed.

WTP Project Borehole Project

The Department retained the USACE to oversee the drilling of one corehole and three geological-sampling deep boreholes at the WTP project construction site to confirm the geophysical properties of the layers of bedrock below the WTP. The analysis of the geophysical properties will confirm the margin of conservatism in the horizontal and vertical responses at the site selected for the construction of the WTP. The drilling of three boreholes to collect data is expected to confirm the seismic design criteria for the WTP. Borehole drilling commenced in June 2006 and was completed in October 2006. Three deep boreholes and one continuously-cored corehole have been drilled into the basalt bedrock and sedimentary interbeds that underlie the Hanford Site to the appropriate depths (approximately 1,400 feet). Each borehole accesses the basalt zone through steel-cased entry holes that are drilled to isolate bedrock from shallower sediments. Down-hole seismic testing began in October 2006. Geophysical and seismic measurement tools have been deployed in the deep boreholes to obtain critical data and additional contractor equipment and staff were used to obtain downhole seismic measurements. A final data analysis report is forecast to be complete by May 2007.

Industry External Flowsheet Review Team Activities at the WTP Project

In March 2006, the external flowsheet review team completed a critical review of the WTP process flowsheet for Bechtel National Inc. The team identified 17 major issues and 11 potential issues, but concluded that they are fixable and will not require any new technologies. In response, Bechtel National Inc. developed a Project Response Plan describing the proposed actions to address the issues and developed individual Issue Response Plans to address specific issue. The plans included the actions required for issue resolution, a schedule for completion, integration with other issues, and integration with the overall project schedule. As of the end of 2006, ORP has approved all but three of the issues. Approval of the last three is anticipated by early 2007. Examples of some of the identified issues include inadequate ultra filtration area and flux, undemonstrated leaching process, plugging of process piping, mixing vessels erosion, inadequate mixing systems, instability of baseline ion exchange resin, pretreatment facility availability, lack of comprehensive feed testing in commissioning, and limited remotability demonstration. Issue resolution has focused on near-term project impacts. Resolution of all issues, with additional analysis and testing, is planned to be completed by late 2008.

WTP Project Hydrogen Accumulation in Pipes and Ancillary Vessels

In 2006, Bechtel National Inc. completed a review of the WTP design to identify locations in which hydrogen could accumulate. These locations are in addition to the primary process vessels, in which the hydrogen buildup is mitigated through the use of spargers, Pulse Jet Mixer (PJMs), and air sweeps of vessel headspaces. Similar locations, such as piping and ancillary vessels, recirculation loops, and heat exchangers, were grouped and analyzed. Several thousand pipe segments and over 100 small vessels were identified as being potentially vulnerable. Twenty generic solutions were identified and applied to the equipment groupings; these included adding high point vents to vulnerable components, removing equipment no longer required by the design and in which hydrogen could accumulate, and implementing new control schedules for PJMs. The final generic solutions and the associated changes in the safety basis documents were formally submitted to ORP for review in the spring of 2006. Calculations to determine the loads on system components in the event of a hydrogen detonation also were developed. In parallel, testing (such as Ultra Filtration Process suction line simulated purging) was performed to ensure the effectiveness of the generic solutions. Bechtel National Inc. preliminarily identified the necessary compensatory controls, which included facility design changes and administrative controls, and is developing design changes to implement the conceptual design modifications. Approval of facility-specific implementation of the solutions by DOE is expected by mid-2007.

Anti-Foam Effects on Hydrogen Generation

In April 2006, Savannah River National Laboratory completed testing of the effects of anti-foam used in

agitated vessels containing simulated tank waste on hydrogen generation and holdup rates. Subsequent testing also was completed at Pacific Northwest National Laboratory. In October, Bechtel National Inc. submitted a test report to ORP describing the effects of selected anti-foam agents on gas retention and release behavior. Testing data indicated that some additional flammable gas (hydrogen) could be retained longer in waste solutions than currently assumed when anti-foam agent was added to control foaming. As a result, the safety basis and design for operating pre-treatment facility process vessels with high solids could be impacted (specifically, the frequency of required vessel mixing). Bechtel National Inc. is continuing to evaluate the data to assess these and other impacts. In November 2006, ORP began conducting an independent review of the issue using resources of Vanderbilt University – CRESP (Center for Risk Evaluation and Stakeholder Participation). Results of the independent review are expected in early 2007.

Fire Coatings on WTP Project Structural Steel

The current fireproofing design approach includes the use of intumescent fire coatings applied to the primary (load bearing) structural steel columns and beams in the Low Activity Waste, High-Level Waste, and Pretreatment facilities. The objectives for the use of the intumescent fire coatings were: 1) to meet applicable building code requirements; 2) to protect the confinement structure; and 3) to protect non-redundant components whose failure could lead to an event that could cause a failure of the confinement structure. In 2006, ORP identified technical issues with the application of these coatings. Some of the coatings were being applied without appropriate certifications, and engineering analysis developed by the contractor did not always have the appropriate technical justification for the application. To address these issues, ORP is working with Bechtel National Inc. to apply a three-phase process that includes identification of members in WTP facilities that require coatings, determination of whether certifications exist for the specific member sizes and shapes, and where no certifications exist, either modification of the steel design for a size that has a certified listing, use of an alternative coating material, conduct of an engineering evaluation, or use of fire testing as a technical basis to ensure that coatings will perform as required by the Department and industry expectations. In some cases within the Low Activity Waste facility, cementitious coatings have replaced intumescent coatings that were damaged by rains during the winter of 2005/2006.

Ultra Filtration System Design

The external flowsheet review team raised two major issues that are consistent with ORP's 2004 design oversight conclusions for the ultra filtration system. External Flowsheet Review Team Issue M13, Inadequate Filter Surface Area and Flux, concluded that as originally designed, the system was the limiting factor in providing waste feed to the HLW and low activity waste (LAW) melters for waste requiring caustic leaching. External Flowsheet Review Team Issue M12, Undemonstrated Leaching Process, concluded that the ultrafiltration system and leaching process have not been demonstrated beyond small-scale laboratory tests.

In response to Issue M 13, Bechtel National Inc. performed an engineering study to identify the maximum increase in ultrafiltration filter surface area that can be included in the WTP hot cell. Bechtel National Inc. identified design changes that can increase the surface area by 92 percent utilizing five filter bundles in series for each of the two ultrafilter trains. This engineering study is planned to be finalized by the end of December 2006. In response to M12, Bechtel National Inc. is performing modeling to develop optimum ultrafiltration system operating approaches, testing tank waste samples using the optimized flowsheet, developing simulants, and testing the ultrafiltration flowsheet with an integrated engineering-scale system. Initial integrated engineering-scale system test results should be available at the end of 2007.

Alternative Ion Exchange Resin Development

In September 2006, Bechtel National Inc. completed preliminary testing of spherical resorcinol formaldehyde resin for qualification as an alternative to the reference SuperLig® 644 resin for removal of cesium from tank waste. The test results indicated the resorcinol formaldehyde resin exceeded all requirements for cesium ion exchange and in most cases exceeded SuperLig® 644 performance. One significant issue was the higher gas generation rate for the resorcinol formaldehyde resin during an accident condition entailing exposure to hot, concentrated nitric acid. Thus, important-to-safety controls, including

larger pressure-relief paths, will be developed. In addition to the performance advantages, the resorcinol formaldehyde resin is expected to be significantly more cost effective. Although three major tests are still under way and five final test reports have not yet been issued, the results are not expected to change Bechtel National Inc. recommendation that the resorcinol formaldehyde resin be utilized in lieu of the SuperLig® 644. ORP anticipates approving spherical resorcinol formaldehyde as an approved equivalent cesium ion exchange resin in early 2007.

Tank Farms Project

Single-Shell Tank Activities

ORP completed waste retrieval on tank C-201 and retrieved 90 percent of the liquid and solid waste on tank C-204 during FY 2006. These tanks are SSTs with a 55,000 gallon capacity and have shown signs of leaking in the past. Vacuum retrieval technology is being used for the C-200 series tanks to limit the use of water during retrieval. Lessons learned using this technology are being developed, and the results will be used prior to deploying the technology on the larger SSTs that may have leaked in the past.

Removing a Failed Sluicer at Tank C-103

Replacing an In-Tank Video Camera in Tank C-103 To Support Waste Retrieval Activities

During FY 2006, ORP also continued retrieving three larger SSTs. ORP completed retrieval of tank C-103 and continues to perform bulk waste retrieval on two SSTs (S-102 and S-112). These tanks are SSTs with a 530,000 to 758,000 gallon capacity and have not shown signs of leaking. At the end of FY 2006, tank S-112 was 99 percent retrieved and S-102 was 56 percent retrieved. Removal of the last amounts of waste, less than one inch in the tank bottom, has been technically challenging. As a result, several technologies were tested in FY 2006 at the Cold Test Facility. Tested technologies, such as the High Pressure Mixer (HPM) and sand mantis, have been selected for deployment in tank S-102. During FY 2006, the HPM was tested at Cold Test Facility and will be installed in tank S-102 early in FY 2007 to mix the waste and to keep the pump inlet screen from plugging, a problem experienced in past retrievals. The Remote Water Lance was deployed in tank S-112 to break up the 30,000 gallons of dense salt cake in the bottom of the tank, removing all but 3,800 gallons of waste.

ORP completed tank C-108 retrieval system construction and startup during FY 2006 and initiated design and procurement for tank C-109 retrieval. These tanks are SSTs with a 530,000 gallon capacity and have not shown signs of leaking. A waste sluicing technology is being used to remove the 66,000 gallons of solid and liquid waste from tank C-108 and the 63,000 gallons of waste from tank C-109. Retrieval operations for both SSTs will occur in FY 2007.

Preparing To Replace a Hose-in-Hose Waste Transfer Pipeline in SY Tank Farm

Evaluation and Maintenance of Double Shell Tank Integrity

The DST corrosion control program has been maintained to protect and evaluate tank conditions. The program establishes waste chemistry controls to minimize tank corrosion. The program has been expanded to include improved testing and assessment of DST waste corrosion propensity and any corrosion impacts. This information will be used to establish more reliable estimates of useful tank life, based on leak integrity corrosion models.

Ultrasonic and visual inspections of all 28 DSTs were completed in 2005. The second round of testing started in 2006. Inspections were performed in the narrow, underground DST annulus region between the primary tank and the secondary containment. The annulus environment has hazardous radiation levels and is examined using specialized, remotely operated robotic equipment to determine wall thickness and to detect small pits or cracks, potentially caused by corrosion. These tanks have volumes of over one million gallons and contain highly radioactive chemical waste.

An expert review panel performed an evaluation of corrosion detection and monitoring in the DSTs. Their recommendations have been incorporated into the corrosion control program. DST ultrasonic testing frequency has been increased for certain tanks, and the area examined during these inspections has been doubled for all tanks. The areas previously examined by ultrasonic testing will be re-examined during each inspection cycle to determine changes due to corrosion. A new in-tank corrosion monitoring probe has been designed and installed in one DST to provide real-time evaluation of corrosion potential and corrosion types and rates.

The expert review panel and laboratory analysis of DST corrosion propensity from exposure was performed on tanks AN-107 and AN-102 waste. Results have provided a better understanding of the following: corrosion mechanisms and important variables in tank waste; improvements in monitoring tank corrosion; and the basis for changing and optimizing the chemistry control specification, which will significantly reduce the amount of caustic (sodium hydroxide) to be added in the future, provide more storage capacity, and will reduce future waste treatment costs.

Significant progress was made in closing Technical Safety Requirement Recovery Plans for DST Corrosion Chemistry Control. Four DSTs had sludge layers with chemistry outside of the required specifications. Chemical additions brought this waste back into specification. The sludge chemistry in one of these tanks returned to specification and the recovery plan was closed. Two of the remaining recovery plans will be closed based on the expert panel and laboratory corrosion analysis. The final tank is undergoing expert panel and laboratory analysis this year, and the recovery plan will be based on the results of this testing and analysis. Supernate chemistry went out of specification in one DST during retrieval operations and was returned to specification within 30 days.

ORP and the tank farm contractor established an expert panel workshop to review the potential for vapor space corrosion in DSTs. This workshop provided a path forward for resolving vapor space corrosion issues and for resolving the Board concern in this area. The July 2006 workshop focused on vapor space corrosion issues on the ORP and DOE SRS DSTs.

The new analysis of record for DST system structural integrity was completed. The analysis included the revised seismic criteria from the WTP, and all DSTs were found adequate for worst-case load and operating conditions.

The Independent Qualified Registered Professional Engineer issued the DST System Integrity Assessment in March 2006 in support of the Resource Conservation and Recovery Act of 1976. The system includes pumps, pipes, detection equipment, and tanks. The new structural analysis, as well as Tank Farms Ultrasonic and Visual Testing of DSTs, have been incorporated into this assessment.

Demonstration Bulk Vitrification System

The Demonstration Bulk Vitrification System (DBVS) is a research and development project with the goal of proving the suitability of bulk vitrification for disposing of LAW from tank farms. Design and testing activities continued throughout FY 2006. Critical Decision 0 (CD-0), Justification of Mission Need, and Critical Decision 1 (CD-1), Approve Preliminary Baseline Range, were approved by the Assistant Secretary for Environmental Management on July 7, 2006. The preliminary design was completed July 28, 2006. The design was reviewed by an expert review panel, and their final report was published on September 28, 2006. The expert review panel found no fatal flaws and identified some technical issues and areas of concern. Key technical issues identified by the expert review panel review were related to dryer performance, complexity of DBVS facility, off-gas system performance, and integrated engineering scale tests. To address the expert review panel issues, a corrective action plan is being written. The final, including expert review panel approval of the corrective actions, is scheduled for March 2007.

Four 130-liter scale dryer tests were performed using tank 241-S-109 LAW simulant. The tests allowed the development of dryer operational parameters. Also, these tests will address the expert review panel issue of dryer performance. Two full-scale melter tests using actual in-container vitrification boxes were performed. The full-scale melter tests were conducted to gather data (heat loads to various system components, nitrogen oxide generation, off-gas particulate composition, etc.) for DBVS design. One melter test used a six-tank composite LAW simulant, and one melter test used tank 241-S-109 LAW simulant. It is planned that waste from tank 241-S-109 will be vitrified by the DBVS facility. Data from the 130-liter scale dryer tests and the full-scale melter tests will be used to conduct an integrated full-scale dryer and melter test in June 2007. The full-scale dryer melter test will also address expert review panel concerns on the function of integrated components.

The work scope for FY 2007 will focus on implementing the expert review panel corrective action plan, completing design, and obtaining Critical Decision 2 (CD-2).

Tank Farms Vapor Issue Resolution

The Tank Farms Industrial Hygiene and Vapor Characterization progressed substantially in FY 2006. Eleven of 18 tank farms have no additional respiratory protection requirements for routine, non-waste-disturbing operations, except in marked areas such as around breather filters. Entry into all other tank farms requires use of supplied air respiratory protection; however, only limited surveillance and maintenance activities are being performed in those areas. During waste-disturbing activities, respiratory protection is currently required in affected tank farms. Extensive analysis of tank samples and tank farm air spaces has been performed for the A-prefix tank farms, C-tank farms, and S-prefix tank farms during waste-disturbing activities; respiratory protection will soon not be required for waste-disturbing activities in those areas. To alleviate concerns by individual workers, voluntary use of respiratory protection continues to be a worker option.

DOE Facility Representative Observing Field Conditions in A Tank Farm

Tank Farms Integrated Safety Management System

ORP declared the tank farm contractor's ISMS effectively implemented in FY 2006 based on the results of contractor management and independent assessments and through regular reviews by ORP line management. Contractor improvements to the ISMS included improvements to the work planning/control process, worksite hazard analysis process, feedback and improvement processes, and continued significant progress towards resolving the tank farm vapor issues.

Tank Farms Authorization Basis Maintenance Activities

ORP approved ten authorization basis amendment requests in FY 2006. These requests supported retrieval activities, preparation for waste feed to the WTP mission, improvement in safety analysis methodology, and strengthening the flammable gas hazards controls. Significant changes approved or reviewed included the revisions to the Tank Farms DSA and TSR to improve flammable gas hazards controls, incorporation of the flammable gas control strategy employed within Tank Farms into the 242-A Evaporator safety basis; implementation of DOE Headquarters Safety Alert requirements on waste drum operations to prevent explosions; adoption of a new methodology for calculating source terms for toxicological releases; and a revision to the methodology used in the 242-A Evaporator DSA to calculate atmospheric dispersion coefficients. A major revision of the Tank Farms Unreviewed Safety Question (USQ) process procedure was made to incorporate the latest DOE USQ guidance on this subject, and new Categorical Exclusions were reviewed and approved by ORP.

ORP sponsored an independent review team to perform an Implementation Validation Review of the TSR controls and to evaluate ORP and Tank Farms contractor processes for safety basis document approval, implementation, and maintenance. The review included the following objectives: validate that the TSR control set has been effectively implemented; validate that the tank farm contractor management team has an adequate knowledge of the DSA and TSR; and validate that an effective nuclear safety infrastructure is implemented to ensure that the DSA and TSR remain current.

Integrated Disposal Facility Construction

The Integrated Disposal Facility is designed to dispose of LLW and mixed LLW. The Integrated Disposal Facility project, landfill cells 1 and 2, consists of a single landfill divided lengthwise into two separate, expandable cells. One cell is permitted as a Resource Conservation and Recovery Act Subtitle C landfill system and will be designed in accordance with the State of Washington Dangerous Waste Regulations. The other cell will not receive dangerous and/or hazardous waste and therefore will not require a permit for this function. The Integrated Disposal Facility initial construction is designed to dispose of 163,000 cubic meters, and full capacity is 900,000 cubic meters.

The Integrated Disposal Facility project was completed in April 2006, which was four months ahead of schedule below baseline cost. The facility has been placed in a safe and compliance care and custody condition pending operational startup for waste receipt. The estimated total project cost is $24.5 million, including future startup readiness costs. The budgeted baseline cost was $33.9 million.

Tank Farm Resource Conservation and Recovery Act of 1976 Corrective Action Project

ORP continues to characterize the large past releases from tank farms to estimate future environmental and human impacts and mitigate past release as per the M-45,-50, 60 Hanford Federal Facility Agreement and Consent Order milestone series. The project has completed the Phase One Facility Investigation Reports for S/SX, B-BX/BY, and T-TX/TY Waste Management Areas and is currently characterizing C, A/AX, and U as the last Waste Management Areas for Phase One. Currently, the program is integrating its characterization efforts and Phase Two planning with RL through the Groundwater Protection Project consistent with the memorandum of understanding and is undertaking discussions with the regulators on the scope of Phase Two. To mitigate groundwater impacts, the project has implemented capping and sealing of approximately 1,000 wells, diverting water away from tank farm surfaces and testing/controlling subsurface water lines. Currently, the project is preparing to demonstrate deployment and evaluation of an interim barrier over T-106, which is estimated to have previously leaked 115,000 gallons and approximately 40 curies of technetium-99.

Environmental Impact Statement

The Tank Waste and Closure of Single-Shell Tanks Environmental Impact Statement were initiated in October 2002 and a Notice of Intent issued on January 8, 2003 (FR Vol. 68, No.5). The Single-Shell Tanks Environmental Impact Statement was initiated and was in development during August 2004 when the State sued DOE over the Hanford Solid Waste Environmental Impact Statement. In 2005, as part of the Settlement Agreement (Washington v. Bodman Civil No 2:03-cv-05018-AAM), it was agreed that the Single-Shell Tanks Environmental Impact Statement, would be expanded to re-examine the groundwater analysis in the Hanford Solid Waste Environmental Impact Statement. The new Environmental Impact Statement, named the Tank Closure & Waste Management Environmental Impact Statement, implements a Settlement Agreement announced on January 9, 2006, among the U.S. DOE, the Washington State Department of Ecology, and the State of Washington Attorney General's office. The Settlement Agreement states that the Tank Closure & Waste Management Environmental Impact Statement will revise, update, and re-analyze groundwater impacts and other resource areas previously addressed in the Hanford Solid Waste Environmental Impact Statement and provide a single, integrated analysis of groundwater at Hanford for all waste types addressed in the Hanford Solid Waste Environmental Impact Statement and the Tank Closure Environmental Impact Statement. The Tank Closure & Waste Management Environmental Impact Statement also will include a re-analysis of onsite disposal alternatives for Hanford's Low-Level Radioactive Waste and Mixed Low-Level Radioactive Waste and LLW and mixed LLW from other DOE Sites. The Fast Flux Test Facility Decommissioning Environmental Impact Statement also was in progress at the time of the Settlement Agreement, and the scope has been combined with the Tank Closure & Waste Management Environmental Impact Statement.

H. Ohio Field Office

The Ohio Field Office was established in 1994 to oversee the environmental remediation of four DOE facilities in Ohio: Fernald, Ashtabula, Columbus, and Miamisburg. Each of these sites completed their environmental cleanup missions in 2006. The following sections summarize safety accomplishments and activities at these four sites in 2006.

West Jefferson North Site After Cleanup—Columbus Closure Project

Environmental Management Accomplishments at Ohio

The contractor at Fernald issued a Declaration of Physical Completion on October 29, 2006. Fernald was completed under the terms of the contract ahead of schedule, under budget, and with an excellent safety record. The Fernald site has completed demobilization and has been turned over to Legacy Management.

The Columbus Closure Project, located at the West Jefferson site near Columbus, Ohio, is owned by the Battelle Memorial Institute and was declared complete by the remediation contractor on February 7, 2006, and validated by DOE in August 2006. DOE is supporting license termination between the owner and the Nuclear Regulatory Commission.

The Ashtabula Closure Project remediation contractor declared physical completion on November 1, 2006, two weeks ahead of schedule and with an excellent safety record.

The "Closure Milestone" for physical completion was reached by the contractor at the Miamisburg Closure Project on July 31, 2006. All safety goals for 2006 were met or exceeded.

All four of the Ohio closure projects used the services of the Oak Ridge Institute for Science and Education to independently verify that the cleanup standards for each of the sites were met.

Ashtabula Closure Project

The Ashtabula Closure Project remediation contractor declared physical completion on November 1, 2006, two weeks ahead of schedule. The contractor successfully executed their fully developed plan, and although a significant increase to the planned volume of contaminated soils was realized during execution, they were able to safely accomplish

2000

June 2002

April 28, 2006

November 2003

June 14, 2006

September 18, 2006

November 12, 2006

Photos of the Ashtabula Closure Project During Various Stages of Remediation

Before After

Before and After Photos of Columbus Closure Project

final remediation, including achieving closure for the Resource Conservation and Recovery Act Waste Management Unit that contained both radiological and hazardous material, within the timeframe needed to achieve regulatory completion by December 31, 2006. Approximately 1.1 million cubic feet of LLW, mixed LLW, sanitary and hazardous waste was shipped off site for disposal during this final stage of remediation, which included final disposition for more than a dozen facilities.

Columbus Closure Project

The Columbus Closure Project, located at the West Jefferson site near Columbus, Ohio is owned by the Battelle Memorial Institute and was declared complete by the remediation contractor on February 17, 2006, and validated by DOE in August 2006. The project has removed all nuclear facilities/foundations, and removed and shipped over 1.3 million cubic feet of contaminated soil and debris off site for disposal. The contractor maintained a strong focus on nuclear safety and had a perfect safety record, one that the Assistant Secretary for Environmental Management acknowledged by formal correspondence. Strict oversight, utilizing DOE Facility Representatives on a rotational basis was maintained until the contractor declared physical completion.

Miamisburg Closure Project

The "Closure Milestone" was reached on July 31, 2006, when "Physical Completion" was declared. With closure being reached in FY 2006, the significant accomplishments of this project can be summarized as follows:

- Accelerated cleanup of former nuclear weapons facility
- The demolition of 64 nuclear, radiological, and commercial buildings, the completion of 79 soil contamination potential release sites, and preparation for transfer of nine buildings and 306 acres
- 9.4 million cubic feet of below-grade LLW removed, which was 5.1 million cubic feet more than planned
- TRU waste shipped to the SRS was 7,900 cubic feet
- Completion of 58 regulatory milestones.

During FY 2006, all safety goals were exceeded. The actual Total Recordable Rate was 1.56, compared to the goal of 1.70. The total number of Occurrence Reporting and Processing System reports and first-aid injuries was reduced.

For Operable Unit-1 at the Miamisburg site, though previously determined to be compliant with the requirements defined by the Comprehensive Environmental Response, Compensation and Liability Act Operable Unit-1 Record of Decision, additional remedial actions were directed by the Congress 2006 House Conference Report 109-275, page 170. The purpose of the project is to safely remove radioactive materials and contamination from the Operable Unit-1 Project Area to levels that will allow for industrial reuse in support of the accelerated closure of Miamisburg. The Operable Unit-1 selected response is an excavation based response action. The Operable Unit-1 Project

MCP Main Hill Before

MCP Main Hill After

Before Photograph of MCP From Operational Support West Building

After Photograph of MCP From Operational Support West Building

Before and After Photos of Miamisburg Closure Project

consists of two distinct sub-projects: Operable Unit-1 and the Potential Release Site 441 (PRS 441). A Task Order will be awarded in early FY 2007 to accomplish this work. Upon completion in late FY 2007, the final Miamisburg site record of decision will be completed, and the remaining parcel of land will be transferred to the City of Miamisburg.

Fernald Closure Project

Fernald project work during 2006 was dynamic, with continued heavy construction equipment operating around the clock to excavate contaminated soils from beneath the demolished main plant facilities. Additionally, both Silo remediation facilities were decommissioned, and waste processing, packaging, and disposal efforts were completed. Hundreds of ground and rail waste shipments were accomplished without significant incident. All of the Silos facilities and rail infrastructure facilities were dismantled, except for a warehouse, which will be utilized in support of the Legacy Management contractor's mission. All heavy equipment used at the site was decontaminated and returned to the rental vendors or shipped to other DOE facilities for use. Hundreds of acres of land were reclaimed and restored as wetlands and wildlife habitat.

At Fernald, DOE and Fluor Fernald, Inc. completed the following accomplishments:

- Safe removal and storage of over 6 million tons of radioactive waste and contaminated debris
- Dismantlement of 323 buildings, including ten major uranium production complexes and administrative structures
- Safe removal, treatment, and shipment of radioactive waste from three large concrete silos, eliminating the largest source of radon gas in the world
- Excavation and shipment of 1 million tons of waste from six waste pits

- Construction of an On-Site Disposal Facility that holds 3 million cubic yards of contaminated dirt and debris from facility demolition

- Treatment of a 225-acre plume of uranium contamination in the underlying Great Miami Aquifer

- Removal of over 100,000 drums of waste and 31 million pounds of uranium product from the site

- Design, construction, operation, and dismantlement of over $300 million in waste treatment and handling infrastructure.

There was a reduction in Occurrence Reporting and Processing System reports, and the total recordable rates for FY 2005 (0.80) and FY 2006 (0.76) are roughly equivalent. There was considerable activity in the ISMS program in response to the changing work environment and dynamic nature of the work leading to final completion. These low total recordable rates demonstrate that the ISMS program at Fernald was effective.

A Declaration of Physical Completion for the Fernald site was transmitted to the DOE on October 29, 2006. After a brief demobilization phase and completion of punch list items, the management of the site (along with the continued operation of the wastewater treatment facility) was transferred to a Legacy Management contractor.

I. Pantex Site Office

The Pantex Site Office is the management office in oversight of the Pantex Plant, which is America's only nuclear weapons assembly and disassembly facility. Pantex has five primary operational missions: (1) weapons assembly, (2) weapons disassembly, (3) evaluation of the weapons, (4) high explosive production and research and development support, and (5) interim plutonium pit storage. The plant is managed and operated for the DOE by BWX Technologies, Inc. (BWXT) Pantex. Safety accomplishments and activities at Pantex during 2006 are as follows:

- BWXT developed and implemented Conservative Decision Making Training to provide production line workers with a common definition of "safe and stable" and to provide them with a uniform and consistent approach in determining the best actions to take in response to off-normal conditions.

- BWXT, with support from the Nuclear Weapons Complex, successfully developed two SS-21 weapon program processes, the W87 and B61, bringing the total number of weapon programs with an approved SS-21 process to six. Additionally, the first production unit for the B61 Alt 357 program was completed.

- BWXT has essentially completed implementation of TSR controls identified in the Technical Safety Requirements Integrated Implementation Project.

Conceptual Design of the High Explosive Transportation Cart

Army/Navy Can Being Inserted Into High Explosive Transportation Cart

High Explosive Transportation Cart Loading Assembly

- BWXT, with support from the national laboratories, has implemented several controls to address electrostatic discharge hazards. Static dissipative flooring, along with specially designed tooling and static dissipative footwear, has greatly reduced the number of administrative controls necessary to support B61 weapon operations. Also, a new electrostatic discharge characterization approach has resulted in a reduction of the administrative controls for two additional weapons programs.

- BWXT has implemented a High Explosive Transportation Cart that protects explosives from mechanical and electrical hazards, including lightning, during transportation between facilities.

J. Portsmouth/Paducah Project Office (PPPO)

On January 14, 2004, the DOE Portsmouth/Paducah Project Office (PPPO) located in Lexington, KY was opened to oversee cleanup activities at DOE's gaseous diffusion plants in Ohio and Kentucky. PPPO manages three major contractors at the Portsmouth site under the EM cleanup mission: Theta Pro2Serve Management Company, LLC, which is responsible for infrastructure services at the Portsmouth Gaseous Diffusion Plant in Piketon, Ohio; LATA/Parallax Portsmouth, LLC, which is responsible for environmental remediation services; and Uranium Disposition Services, LLC, which is responsible for the Depleted Uranium Hexafluoride (DUF_6) Conversion Project. PPPO also oversees additional DOE-related activities conducted by the United States Enrichment Corporation.

In FY 2006, the PPPO completed ISMS validations for the construction activities at the Depleted Uranium Dispositioning Project at the Portsmouth and Paducah Sites and the remediation and infrastructure contractor work effort at the Portsmouth site. Although several areas for improvement were identified, the ISMS teams concluded that ISMS was adequately implemented in these projects. The ISMS validation for the Paducah remediation and infrastructure contractor review is scheduled to be conducted by March 2007.

The following sections highlight project safety accomplishments for the Portsmouth/Paducah Project Office for 2006. The accomplishments are grouped by major project area.

7725 Space Waste Cleanout To Remove Risk at Portsmouth

Depleted Uranium Hexafluoride Dispositioning Project

Noteworthy accomplishments at the Depleted Uranium Hexafluoride Dispositioning Project include:

- Obtained Critical Decision 2 (CD-2), *Project Baseline*, and Critical Decision 3, *Start Balance of Construction* approval and initiated building construction

- Accomplished over 600,000 safe work hours without a lost time accident

- Continued Cylinder Yard Operations

- Developed a high level Operational Readiness Schedule

- Overall construction progress stands at approximately 50 percent complete

- Conducted/completed numerous project oversight assessments

- Corrected quality problem related to Conversion Building panel fabrication/installation

- Finalizing the Supplement Analysis for submittal to Headquarters for publication for public comment

- Drafted Record of Decision amendments as a result of Supplement Analysis determination

- Established hydrofluoric acid unrestricted release limits

- Awarded hydrofluoric acid sales contract
- Risk Management Plan selected as best practice publicly available through EFCOG
- Resolved Paducah seismic issue
- Obtained transportation exemptions enabling transportation of non-compliant ETTP cylinders to Portsmouth
- Received ETTP cylinders aiding in accelerated closure for ETTP.

Panoramic View of the Depleted UF_6 Conversion Facility at Portsmouth

Portsmouth Remediation and Infrastructure Project

Noteworthy accomplishments at the Portsmouth Remediation and Infrastructure Project include:

- Shipped more than 7,000 containers (bringing the total to 45,000 containers) of waste off site for disposal.
- Completed demolition of 12 out of 14 inactive facilities, the first major demolition campaign at Portsmouth.
- Facilitated closure of more than 74,500 square feet (bringing the total to 113,000 square feet) of storage space in X-7725 as part of accelerated cleanout of the building.
- Completed cleanout of X-3001 and X-3002 and disposed of materials at NTS. DOE took a prominent role in resolving classification issues for transportation and disposal space allocation at NTS, thereby completing the majority of shipping activities for Gas Centrifuge Enrichment Plant cleanout nearly a year ahead of schedule.
- Implemented path forward to process the 1,063 containers of the most challenging waste at the site.
- Received approval of DOE and contractor ISMS programs in August 2006.
- With the FY 2006 completion of over 2,500 metric tons of uranium (for a total of over 10,000 metric tons cleaned), completed 66 percent of technetium-99 decontamination program.
- Implemented the Cold Shutdown Project, terminating the Cold Standby Project.
- Worked to resolve the path forward for the X-701B alternative remedy for trichloroethylene contamination.
- Achieved re-qualification for one and completed qualification of the second Facility Representative at Portsmouth.
- DOE assumed a more active role for lease administration consistent the June 2002 agreement.
- Improved on overall safety performance at the site (fewer injuries and Occurrence Reporting and Processing System reports) even though the site now has four contractors actively performing work.
- Portsmouth was one of the six winners from EM for the DOE Best-in-Class Pollution Preventions award. There were 33 Best-in-Class award winners across the DOE complex.

Paducah Remediation and Infrastructure Project

Noteworthy accomplishments at the Paducah Remediation and Infrastructure Project include:

- Completed final characterization, repackaging, and disposal of 1,900 drums of UF_4.

- Completed the decontamination and decommissioning (D&D) of the C-603 Nitrogen Facilities.

- Completed the D&D of the C-402 Lime House.

- Completed the preparation and transfer of approximately 13 breached fluorine cells for commercial re-use.

- Completed a project to remove over 500 cubic meters of outside legacy LLW.

- Shipped the last of the legacy mixed/Toxic Substances Control Act waste ("Soft Solids") to the Toxic Substances Control Act incinerator for treatment and disposal.

- Completed the installation of the leachate treatment system at the C-746-U landfill.

- Completed the equipment and utility lines removal in C-411 (Zone 64) and C-420 (Zone 21) as part of the C-410 D&D effort.

- Completed the packaging and shipment of over 12,300 tons of contaminated scrap metal. This brings the total volume of waste disposed from the scrap metal project to 23,900 tons. An additional 4,500 tons of contaminated scrap metal were packaged and are awaiting shipment in early FY 2007.

- Completed C-400 Remedial Design/Site Investigation field work on August 25, 2006. Fieldwork began on June 25, 2006, and was completed two weeks ahead of schedule. A total of 51 direct push technology borings were conducted that allowed the site to pinpoint the Dense Non-Aqueous Phase Liquid source in the aquifer and to aid in the design of electrical resistance heating technology.

- Completed and submitted D2 Southwest Plume Site Investigation/Risk Assessment Report to EPA/KY on May 17, 2006. Included the investigation of groundwater at the C-747-C Oil Landfarm and areas northeast and southeast of the C-720 Building. Investigation data supports a no-further-action alternative.

Scrap Yard Before and After

- Completed D0 Surface Water Operable Unit Site Investigation/Risk Assessment Report on April 21, 2006. The investigation identified "hot spots" in the North/South Diversion Ditch and internal ditches. A total of 3,000 soil and sediment samples were collected to support a future Removal Action.

- Completed and submitted C-400 Land Use Control Implementation Plan to EPA/KY on September 20, 2006. This defines requirements for future land use controls for the C-400 Building area.

- Completed, submitted, and received EPA/KY approval on the 2006 Site Management Plan transmitted to the regulators on July 14, 2006. The plan outlines the strategic and project approach for addressing contamination at the site and included regulatory milestones for the various cleanup projects.

- Completed, submitted, and received EPA/KY approval on the D2 C-400 Remedial Design Work Plan transmitted to the regulators on December 29, 2005. Approval allowed the site to proceed with development of the Remedial Design Report and Remedial Action Work Plan.

- Completed D0 C-400 30% Design on August 4, 2006.

- Completed and submitted D2/R1 Burial Grounds Operable Unit Remedial Investigation/Feasibility Study Work Plan to EPA/KY on August 28, 2006. A total of 43 borings and approximately 300 soil and groundwater samples are proposed and will support future remedial decisions once field work is complete.

K. Richland Operations Office (RL)

The DOE – Richland Operations Office (RL) manages the cleanup work at the Hanford Site. RL made significant cleanup progress in 2006, demonstrating commitment and dedication to safely cleaning up the legacy of the Hanford Site. The cleanup is being completed safely, as shown by the fact Hanford has one of the lowest recordable injury rates in the complex and by a majority of our contractors obtaining Voluntary Protection Program STAR status.

The following sections summarize RL activities and accomplishments in 2006.

Plutonium Finishing Plant

The Plutonium Finishing Plant (PFP) performed a lay-up evaluation and associated hazards analyses due to the direction to delay D&D. The project is taking necessary steps to ensure that robust systems are maintained for a safe and secure posture until full-scale D&D is resumed.

PFP demolished six facilities, including the former plutonium incinerator facility (232-Z). Cleanout of the plutonium incinerator facility was one of the most difficult tasks PFP will face during D&D of the PFP complex, due to the amount of unsecured ash and contamination in the facility.

PFP completed the Resource, Conservation, and Recovery Act cleanout of the 241-Z vaults and tanks. The 241-Z facility was used to collect liquid wastes (acids and corrosive chemicals contaminated with plutonium) from PFP operations prior to batch transfer to the Hanford tank farms. Four 4,600 gallon tanks and vaults were cleaned to the Closure Plan standards. Workers cleaning out the tanks and vaults posted a tremendous safety record, given the confined-space issues, heat stress concerns, visibility issues, and very high levels of contamination.

PFP completed cleanout of 19 gloveboxes and hoods (for a total of 63) formerly used for plutonium processing and laboratory operations, removing equipment and other materials contaminated with plutonium.

PFP completed disposal of several waste streams, including loading and shipping 644 large plutonium solution containers from the main PFP building (234-5Z). This finished a three-year project to dispose of a large group (over 300) of miscellaneous sources and standards left over from a variety of activities, including experiments, at Hanford. It also included packing and disposal of 794 vibration packed fuel pins, which were manufactured at Hanford more than 40 years ago for criticality experiments.

The Material Access Area in 234-5Z was eliminated, making work safer, more efficient, and less costly. A Material Access Area is a security area confined by physical barriers containing significant quantities of special nuclear materials. In the last year, the main plant's plutonium-bearing materials were shipped out as waste or moved to vault storage.

K Basin Closure Sludge Retrieval and Disposition

- Processing of K East Basin North Load Out Pit sludge (3½ cubic meters) was completed at T-Plant. The North Load Out Pit sludge was grouted into 332 drums.

Tore Down the First of 9 Highly Contaminated Buildings at the Plutonium Finishing Plant—With 17 of 63 Original Buildings in the 15 Acre Complex Demolished or Removed. The Plant Had Once Been the Primary Facility for Processing Weapons-Grade Plutonium

Consolidated Radioactive Sludge (an Estimated 55 Cubic Yards) Vacuumed from the Floors of Hanford's K East Basin. Began Transferring the Sludge Out of the Basin in Preparation For Draining and Removing the Leak-Prone Pool

Treated Radioactive Sludge: Approximately 5 Cubic Yards of Less Radioactive Sludge Removed from the K East Basin and Mixed with Specially Formulated Cement for Disposal

- Radioactive sludge is being containerized and transferred from K-East Basin to the K-West Basin using a Hose-In-Hose transfer system. As of December 8, 2006, an estimated 2.8 cubic meters of sludge has been transferred from the K-East Basin to the K-West Basin.

- Completed removal of fuel racks and debris (approximately 100 tons of material) from K-East Basin in February 2006.

- Completed removal of small debris (approximately 14,000 cubic feet) from K-West Basin in July 006.

- Removed the last remaining fuel (found during sludge vacuuming) in K-East Basin and transferred it to K-West Basin.

- Completed a readiness assessment and initiated operations of the K-West Basin Floor and Pit Sludge Retrieval System.

Waste Treatment and Disposal

- Safely retrieved 1,500 cubic meters (over 4,700 cubic meters cumulative) of retrievably stored suspect TRU waste from the Low Level Burial Grounds.

- Safely completed removal of all retrievably stored waste containers from Trench 4 of burial ground 218-W-4C. Trench 4 contained about 1,926 cubic meters of waste in 9,960 containers and was considered a high-risk trench due to the degraded condition of the containers.

- The site made over 300 shipments of TRU waste containing more than 8,800 drum equivalents of TRU waste to the WIPP in New Mexico for disposal.

- Treated over 900 cubic meters (5,000 cubic meters cumulative) of mixed LLW.

- Disposed of approximately 1,000 cubic meters of LLW and mixed LLW.

Central Plateau Remediation

- Demolished eight excess facilities on the Central Plateau (seven industrial and one nuclear [MO-936 at REDOX])

- Completed 19 Waste Site Remediations

- Completed six source unit related Tri-Party Agreement milestones

Retrieved Buried Waste—the First 21,300 of 75,000 Drums of Radioactive Material—Five Months Ahead of the Regulatory Milestone

- Reached tentative agreement with Regulators to modify Tri-Party Agreement milestones to accommodate supplemental characterization.

River Corridor Closure Project

- Completed demolition of 62 facilities (versus seven planned), including the 333 N Fuels building at 57,000 square feet, the 314 Engineering Development Laboratory at 29,000 square feet, the 163N Demineralizer building at 29,000 square feet, and the 1723N warehouse at 12,000 square feet.

- Completed remediation of 43 waste sites (versus 37 planned), including the 618-3 Burial Ground, 618-8 Burial Ground, and the 116-K-2 Mile Long Trench.

- 324 Chemical and Materials Engineering Laboratory/327 Post-Irradiation Test Laboratory:

    - Received EPA approval, pursuant to the CERCLA process, for the demolition and removal of the 324 and 327 facilities. These facilities contain enclosed areas with radiation levels of up to 15,000 rem per hour. Both of these facilities are within three miles of the Richland city limits.

    - The Resource Conservation and Recovery Act Closure plan for the cleanout of hot cell areas of the 324 facility was approved by the Washington State Department of Ecology.

    - Renegotiated a consent order milestone with EPA and the Washington State Department of Ecology to coordinate Resource Conservation and Recovery Act closure activities with CERCLA demolition activities.

    - Cleanout activities began in earnest. Over 100 tons of radioactive and chemical wastes were sent for disposal. Materials, contaminated tooling, and fume hoods are being stripped from the facilities, regulated oil was removed, and asbestos abatement was completed. Sanitary waste (non-radioactive/non-hazardous) is being removed from the support areas of the facilities. Excess equipment removal was initiated and continues.

    - Beryllium characterization of the 324 facility is nearly complete.

Recently Completed Remediation of the Liquid Waste Trench in Hanford's K Reactor Area. Contaminated Soil From the "Mile Long" Trench Has Been Removed, then Backfilled and Vegetated. It is Adjacent to the Columbia River

Waste Operations

During the period January 1, 2006, to December 13, 2006, more than 500 thousand tons of contaminated material in the Environmental Restoration Disposal Facility was disposed of, bringing the total disposed to more than 6.5 million tons since operations began in 1996.

Contaminated Soil and Other Material from Hanford's River Corridor Is Being Disposed of in the Environmental Restoration Disposal Facility. Water Is Being Applied for Dust Control

Board Recommendations and Safety Issues for 2006

- Commitment 119E, Complete bulk sludge containerization of K-East basin sludge, in the implementation plan for Board Recommendation 2000-1 was completed on October 20, 2006.

- RL completed Feedback and Improvement and Work Planning assessments to support commitments 23 and 25 in the DOE's implementation plan for Board Recommendation 2004-1. In addition, RL and the RL prime contractors implemented DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*, in September 2006.

- The open RL commitment to complete the DOE implementation plan in response to Board Recommendation 2004-2 entails a review of the safety classification of current Confinement Ventilation Systems and their safety functions, and assessment of the feasibility of upgrading those systems to current codes and standards. During 2006, RL completed a review of the proposed Confinement Ventilation Systems at the Cold Vacuum Drying Facility, and will be completing the reviews on current Confinement Ventilation Systems for T-Plant, Waste Receiving and Processing, and the Waste Encapsulation Storage Facility. An assessment of the need and feasibility of upgrading those Confinement Ventilation Systems will follow in 2007.

- The RL commitment to complete DOE implementation plan for Board Recommendation 2002-3 entails a review of current controls to determine the need for Specific Administrative Controls. Training was completed in late 2005. Review of the Waste Management DSA and controls was completed during 2006, and example Specific Administrative Controls were developed and reviewed by RL. Final development of a complete set of Specific Administrative Controls will be included in the next annual update to the Master DSA.

Contractor Oversight

RL oversight is based on an evaluation of hazards, the importance of activities to the site mission, performance indicators, past performance, and input from DOE oversight, including RL safety system oversight and Facility Representatives. RL conducted over 440 planned reviews of contractor activities in FY 2006.

Drums Unearthed from a Burial Ground Near the Columbia River in Hanford's Reactor Areas Are Surveyed for Contamination

In addition to the planned oversight, RL uses an Operational Awareness database in which RL staff record daily contractor oversight observations. This system allows for the collection of a wide range of information at an informal level, thereby giving RL an additional tool to evaluate contractors' ISM performance. Each month and each quarter, this information is analyzed for potential trends and new areas in need of management attention and contractor corrective actions. For FY 2006, RL generated 4,281 operational awareness entries against the contractors' performance of work. From these entries, 1,135 issues (18 Concerns, 297 Findings, and 820 Observations) and 115 Good Practices were identified and communicated to the contractors.

Together with the monthly reports and quarterly trend analysis, issues are brought routinely to the RL Manager's attention through weekly operation oversight reports. RL continues to optimize this process through development of a web-based database that will allow pictures and documents to be uploaded to supplement the Operational Awareness entries.

In general, RL has concluded that the RL contractors have a robust ISMS Description. Incidents during FY 2006 primarily resulted from inadequate implementation of the contractors' ISMS rather than a lack of appropriate processes and procedures contained in the contractors' ISMS Description. Both RL prime contractors have reduced Occupational Safety and Health Administration injury rates dramatically throughout FY 2006. Fluor Hanford, Inc. ended FY 2006 with a Total Recordable Case rate of 0.78 and a Days Away, Restricted, or on Job Transfer rate of 0.31. Similarly, Washington Closure Hanford ended FY 2006 with a Total Recordable Case rate of 0.56 and a Days Away, Restricted, or on Job Transfer rate of 0.23. These rates are well below the EM average and are approaching commercial industry leader rates, as recently communicated by a Headquarters evaluation.

During FY 2006, RL contractors made progress on implementing the human performance improvements approach to enhance continuous improvement. Improvements were observed at the pilot project

A Support Building for Hanford's N Reactor Is Being Demolished. It Is One of Hundreds of Surplus Facilities That Will Be Demolished as Part of the River Corridor Closure Project

where the approach was implemented, and widespread implementation of the principles is planned throughout FY 2007. It is recognized that this cultural change will require DOE and contractor commitment over the next couple of years to fully realize the benefits of these tools.

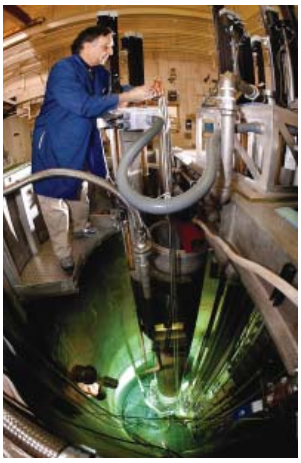
L. Sandia Site Office (SSO)

The Sandia Site Office (SSO) is the management office in oversight of the Sandia National Laboratories. Sandia National Laboratories designs all non-nuclear components for the nation's nuclear weapons, performs a wide variety of energy research and development projects, and works on assignments that respond to national security threats. The following sections summarize safety accomplishments, status of nuclear facilities, and significant interface activities with the Board and staff during 2006.

Safety Basis Improvements

SSO and Sandia National Laboratories (Sandia) continued to focus on making improvements in safety basis analysis and documentation that were originally identified in a September 27, 2004, Board letter. Sandia developed and implemented a corporate improvement plan called the Safety Basis Improvement Project for its safety basis program. Significant milestones in the plan that have been achieved in the past year include: a major revision to the USQ procedure, development of an Implementation Validation Review process, and development of a Safety Analysis and Risk Assessment Handbook. Sandia provided training to both SSO personnel and Sandians on the USQ process, Implementation Validation Review process, and Safety Analysis and Risk Assessment Handbook document this fiscal year. Sandia also implemented the new Safety Analyst Training and Qualification Program Plan, and the first group of safety analysts received their qualifications in September of 2006. The safety basis improvement project also included actions to strengthen the role of Sandia senior management, improve the processes for developing safety bases, and establish independent reviews.

Manipulators at the Auxiliary Hot Cell Facility



Reactor Operator Checks Equipment on the Annular Core Research Reactor, Which Sits at the Bottom of a 30-Foot-Deep Open Pool

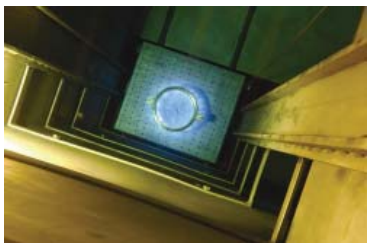
Cherenkov Radiation Is Seen as a Flash When the Annular Core Research Reactor Performs a Pulse

Sandia Nuclear Facility Status

Annular Core Research Reactor: Operational. The Annular Core Research Reactor supported an aggressive schedule of customers in 2006. Additionally, the DSA has undergone a significant revision and was delivered to the SSO for review in October 2006.

Auxiliary Hot Cell Facility: Not Operating. Use of this facility for radiological activities is being explored by Sandia.

Gamma Irradiation Facility: Operational. The Gamma Irradiation Facility DSA has been revised and was delivered to the SSO for review in September 2006. The facility has expanded its inventory of cobalt-60 since beginning its operation in 2000, to over 200,000 curies, giving the facility greater operational



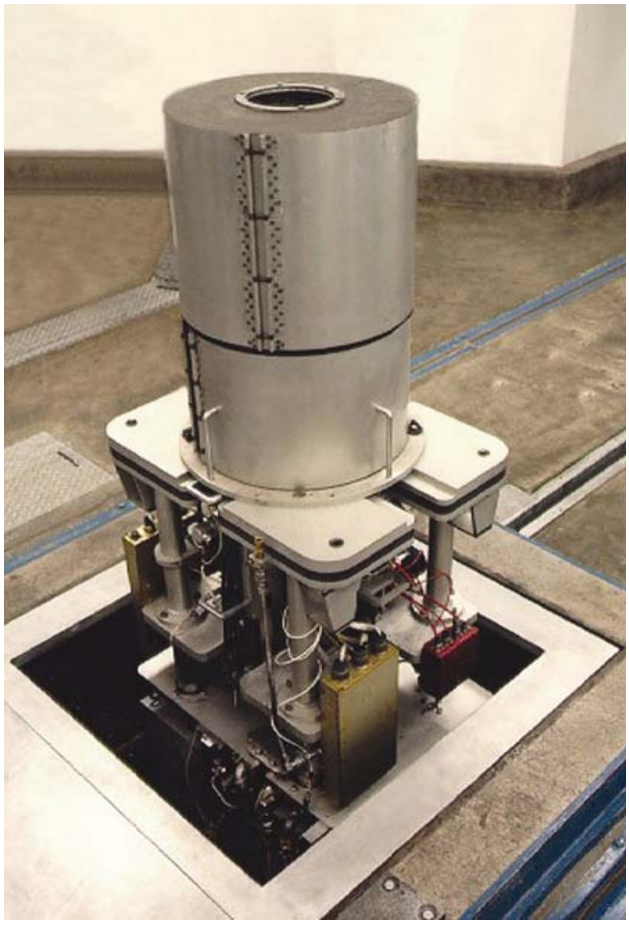
A Cobalt-60 Source Fixture Gives Off Cherenkov Radiation at the Bottom of the Gamma Irradiation Facility Storage Pool

flexibility to provide irradiation services to various customers.

Manzano Nuclear Facility: Operational. The Manzano Nuclear Facility provides secure storage for legacy material at Sandia. The facility DSA is undergoing revision, to include a new site boundary.

Onsite Transportation: Operating Below Hazard Category 3. The Onsite Transportation DSA and TSRs were approved by SSO in November 2006. This is in preparation for startup as a Hazard Category 3 Nuclear Activity in CY 2007.

Sandia Pulsed Reactor Facility: Reactor Not Operating. The Sandia Pulsed Reactor III reactor was safely restarted in the fall of 2005 and was operated extensively in 2006. The Sandia Pulsed Reactor III reactor was operated for 159 days, performing 563 operations. The Sandia Pulsed Reactor III performed its last operation on September 30, 2006. The Sandia Pulsed Reactor III reactor will be placed in long-term storage, and the facility will continue to be operated as a nuclear facility. Activities are ongoing to perform critical experiment (SPR/CX) operations in CY 2007.



The Sandia Pulsed Reactor in Its Operating Configuration

Significant Interface Activities with the Board and Staff

The Board held a meeting at Sandia on March 23, 2006, to address the topics of:

- ISM (including the Technical Area V Integrated Management System)
- Status of Technical Area V Facilities
- Status of safety basis for Technical Area V Facilities.

For the topics addressed, no issues or concerns were identified by the Board that required a specific corrective action plan. Based on the meeting, it was SSO's understanding that the Board and its staff would continue to monitor the progress in completing the safety basis-related corrective actions as identified in the safety basis improvement project.

On December 1, 2006, Board member Larry Brown visited Sandia. The purpose of the visit was for Mr. Brown to become familiar with the mission of the SSO and Sandia, to obtain a briefing on the nuclear facilities at Sandia, and to understand Sandia's role in the nuclear weapon complex. There were no actions as a result of this visit.

SSO and SNL hosted the assigned Board staff personnel on January 23-26, 2006, and on October 3, 2006. The topics of interest for the visits included the status of the Auxiliary Hot Cell Facility, the nuclear material de-inventory status, nuclear material packaging, the status of the safety basis improvement project, ISM, and SNL support to Pantex.

SSO and SNL conducted a video teleconference with the assigned Board staff person on February 28, 2006. The topic of the discussion was occurrence reports and the manner in which trending is performed on the reports.

SSO and SNL responded to six document requests from the Board during 2006, including a request for the DSA for the Annular Core Research Reactor and the Gamma Irradiation Facility.

M. Savannah River Operations Office (SR) and Savannah River Site Office (SRSO)

The Savannah River Site (SRS), consisting of the DOE-Savannah River Operations Office (SR) and NNSA-Savannah River Site Office (SRSO), focuses on three mission areas in overseeing the management and operations contractor and other contractors at the Savannah River Site. These mission areas include nuclear weapons stockpile stewardship, nuclear materials stewardship, and environmental stewardship. The SRS is a key DOE facility, associated with products and services essential to achieving the DOE's goals.

Key Highlights at the Savannah River Site During 2006

SRS supported the Board and their staff in 2006 by providing them more than 900 documents in support of their oversight activities. Additionally, the Board conducted 22 onsite reviews in 2006, including two visits by the Board members.

As of mid-December, Washington Savannah River Company Operations and Construction employees achieved several significant safe work milestones. Operations exceeded 10.3 million hours and 236 days since their last injury requiring days away from work. Construction exceeded 19.2 million hours and 3,086 days since their last injury requiring days away from work. Their last lost time injury was over eight years ago in June 1998.

DOE-SR implemented a new oversight process effective September 15, 2006, to meet the requirements of DOE Policy 226.1, *Department of Energy Oversight Policy*, and DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*.

Washington Savannah River Company achieved their fourth Star of Excellence Award under the DOE Voluntary Protection Program. In order to earn this award, a contractor must have injury rates that are at least 75 percent below their industry average. In addition, they must provide mentoring and outreach services to others who are seeking to achieve Voluntary Protection Program STAR status.

Washington Savannah River Company earned the Legacy of Stars Award under the DOE Voluntary Protection Program. In order to earn this award, a contractor must earn the Star of Excellence Award for at least three consecutive years.

DOE-SR is coordinating the implementation of DOE Rule, *10 CFR 851, Worker Safety and Health Program*, on site. In March 2006, DOE-SR and NNSA-SRSO technical staff and senior staff were provided with briefings on the requirements and implications of DOE Rule, *10 CFR 851, Worker Safety and Health Program Implementation*. At that time, an Integrated Project Team was established on site including DOE-SR, NNSA and contractor staff to ensure effective and efficient implementation of the rule. Points of contact were established for each contract on site and a project execution plan was developed to ensure that all rule deadlines were met. A DOE-SR Desktop Instruction was developed to ensure consistent review of Worker Safety and Health Programs prior to approval by the DOE-SR Manager. Implementation activities have also been closely coordinated with DOE Headquarters and NNSA Headquarters to ensure consistent implementation across the DOE complex. The Site is on schedule to implement this rule by the deadline.

DOE-SR established a Recreational Policy for the Site that identifies what recreational activities that employees may engage in on site, and provides guidelines to ensure that those activities are performed safely.

In August 2006, the SRS Workplace Safety, Health and Security Policy and the Environmental Management System Policy were both issued and included approvals from two new groups on site—Duke Cogema Stone & Webster, and Parsons—in addition to DOE-SR, NNSA-SRSO, Washington Savannah River Company, Wackenhut Services Inc., Savannah River Ecology Laboratory, and United States Forest Service-SR.

Activities Related to Board Recommendations at the Savannah River Site

The SRS is committed to implementing the Board's recommendations. The following sections summarize actions taken in 2006 to support Departmental implementation plans to address Board recommendations.

Board Recommendation 2004-2, *Active Confinement System*

SRS has successfully completed several evaluations in accordance with Board Recommendation 2004-2. The evaluation of the Actinide Removal Process was completed in July 2006 and was the first pilot evaluation completed in the DOE complex. Subsequent to this pilot, SRS completed evaluations for the Pit Disassembly and Conversion Facility Project (also a pilot evaluation), the Container Storage and Surveillance Capability Project, and the Plutonium Vitrification Project. The Container Storage and Surveillance Capability and Plutonium Vitrification projects were designated by DOE EM as High Priority Evaluations. In addition to these evaluations, implementation strategies for completing the remaining Medium and Low priority facility segment evaluations have been developed. SRS has also submitted the lessons learned from performing the pilot evaluations to DOE Headquarters in accordance with the implementation plan.

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

The implementation plan for Board Recommendation 2004-1 had two commitments, revitalization of ISM and improved safety oversight. The two areas addressed by the commitments were: 1) work planning and control, and 2) feedback and improvement. Both of these commitments involved the conduct of site assessments and the subsequent development of action plans to address any issues discovered during the assessment process.

In 2006, Washington Savannah River Company initiated five ISM revitalization activities to address the two action plans described above and continuous improvements in three additional areas:

- Implementation of ISM in the life cycle of projects
- Human Performance Improvement
- Enhanced communication and ISM culture development.

SRS is making good progress in the ISM revitalization area, with some activities drawing to a successful close at the end of CY 2006 and others, notably work planning and control and human performance improvement, scheduled to proceed into CY 2007. These activities benefit from information that was presented at a DOE ISM Champions Best Practices Workshop held in Denver in September 2006. The Site is utilizing several of the good concepts and practices shared at the workshop by contractor and DOE participants from across the DOE complex.

Board Recommendation 2002-3, *Design, Implementation, and Maintenance of Administrative Controls*

Significant progress has been made in the development, approval, and implementation of specific administrative controls at the Savannah River Site nuclear facilities. To date, most facilities have submitted the new and/or revised controls to DOE for review, and several have already implemented them. All facilities are scheduled to have the specific administrative controls implemented by the middle of CY 2007.

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

Washington Savannah River Company QA/SQA has completed all required actions that were defined in the DOE planned responses to Board recommendation 2002-1. These included:

- DOE Quality Assurance Improvement Plan
- DOE Software Quality Improvement Plan.

Assessments and reviews were completed to validate the Washington Savannah River Company Safety Related Software program and processes. Additional improvements to the SQA program, which are based on DOE and industry guidance, are in the process of being implemented.

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

Board Recommendation 2001-1 addressed the margin of safety and the amount of tank space in the SRS HLW system to enable timely stabilization of nuclear materials.

Six commitments remain open in the Department's implementation plan for Board Recommendation 2001-1. Construction is essentially complete on the

three interim salt processing projects, with only startup testing costs remaining. The other three commitments contain projects that have not yet been formally baselined; however, preliminary scoping estimates indicate the cost to be around $1 billion. The last commitment is currently scheduled to be completed in 2011.

Board Recommendation 2000-1, *Stabilization and Storage of Nuclear Material*

On October 13, 2006, DOE Headquarters informed the Board that SRS had completed its final commitment from the Board Recommendation 2000-1 implementation plan. It was completed when the last of the pre-existing neptunium solutions that were stored in H-Canyon were processed through HB-Line and converted into a more stable oxide form. This oxide was then packaged into shipping containers and sent to K Area Material Storage for interim storage. This material will be shipped to INL for future use in the space program. The commitment, the last of 54 related to SRS in this implementation plan, was completed three months ahead of schedule.

TPBARs Cask Delivery

Tritium

The biennial assessment of the SRS was completed by the Office of ES&H Evaluations in February 2006. Nineteen findings were identified during the course of this assessment; of these, four were directed towards the NNSA-SRSO. All SRSO corrective actions associated with these findings were completed ahead of the scheduled dates. Implementation of these corrective actions resulted in improved oversight processes and practices within the Site Office.

SRS Defense Programs met or exceeded all mission requirements in FY 2006, including Limited Life Component shipments, Stockpile Surveillance data, and 46 NNSA Milestones. Defense Programs also exceeded a safety milestone of over 6.9 million hours without a lost time accident.

Tritium Extraction Facility

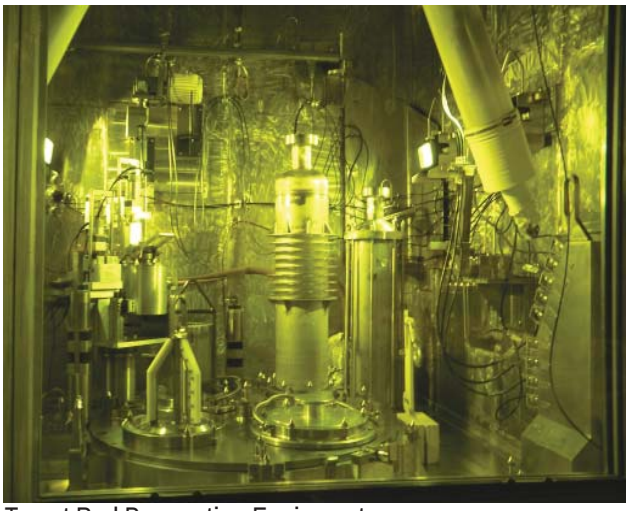
Major construction of the Tritium Extraction Facility (TEF) was completed ahead of schedule and under budget. Cold testing of the remote handling and gas processing systems continued throughout the year in preparation for the contractor and NNSA ORRs. The NNSA ORR was completed November 2, 2006; the ORR Chair was very complimentary of the project and involved personnel. Tritium was initially introduced into the facility on November 30, 2006, to begin hot testing of the gas processing systems. The initial batch of irradiated Tritium Producing Burnable Absorber Rods arrived on December 1, 2006.

Startup activities and a Readiness Assessment for the reservoir hydroburst facility were completed. This facility provides hydroburst capability to support reservoir surveillance operations.

H-Area's first tritium-producing facility was safely deactivated in 2006. All materials were removed from the facility, ventilation modifications were completed, and primary power to the facility was disconnected. The doors have been locked, leaving the facility "cold, dark, and dry" for a long-term safe state. All work was completed with no personnel safety, electrical safety, or environmental issues.

The Board visited SRS in June 2006 to receive briefings regarding the implementation of DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*.

Throughout the year, the Board staff from Headquarters and other DOE sites monitored progress of TEF startup activities. These visits included Headquarters personnel during April 2006 who



Target Rod Preparation Equipment

monitored operator proficiency, and Headquarters personnel and personnel from other DOE sites who monitored the contractor and NNSA ORRs.

On August 17, 2006, the Deputy Secretary approved the mission need, critical decision (CD-0), and the selection of continued operation of the H-Canyon as the preferred alternative, CD-1, for the new SRS Enriched Uranium Disposition Project. That project includes continued operation of the H-Canyon facilities for several years to process aluminum-clad highly enriched uranium (HEU) spent nuclear fuel (SNF) and other HEU-bearing materials that would provide low enriched uranium (LEU) for this expanded program with the Tennessee Valley Authority (TVA).

The two recently confirmed Board members, Dr. Peter Winokur and Mr. Larry Brown, visited the TEF in December 2006.

F Area Closure Project

F Area Closure Project completed the final 20 milestones for Deactivation of FB-Line in June ahead of schedule. All plutonium has been removed from FB-Line, and the facility is now locked and is only entered to perform periodic surveillances.

From December 2005 through November 2006, F Area Closure Project shipped 736 of the 35,000 drums (original inventory of depleted uranium oxide drums) to complete the 20-railcar campaign that began in FY 2004. Each railcar contained ninety-two 55-gallon drums inserted in 85-gallon overpacks. Disposal of the drums supports F-Area deinventory and site deactivation and decommissioning requirements. Approximately 25,000 drums remain now that these two campaigns have been completed.

In November 2006, 20 shipments totaling 227 drums of LEU oxide were shipped by truck to the NTS for disposal. These shipments completed the disposal of LEU to support deinventory of F Area.

F Area Closure Project completed its final deactivation milestone in August when the 804 Underground Tank was declared deactivated and the 800-series underground tanks were turned over to Site Deactivation and Decommissioning.

In 2005, DOE directed F Area Closure Project to restore certain systems in F-Canyon to prevent further degradation of the infrastructure pending final endstate determination. F Area Closure Project completed the Phase I and II milestones associated with restoration in November 2006.

F-Canyon successfully initiated remediation of TRU waste drums in the Warm Crane Maintenance area. There are now two remediation lines in service at F-Canyon for TRU drum remediation. At the end of November, a total of 350 drums had been repackaged.

H Area Completion Projects

At the end of FY 2006, H Canyon had blended and shipped about 202,000 kilograms of LEU solution. The LEU is sent to Tennessee to be converted into materials suitable for use in the TVA's commercial power reactors. Discussions are ongoing with TVA to expand this program to other legacy DOE materials, and extend LEU shipments beyond the current expected completion date in mid-2007. On August 17, 2006, the Deputy Secretary approved the mission need, Critical Decision 0 (CD-0), and the selection of continued operation of the H-Canyon as the preferred alternative, CD-1, for the new SRS Enriched Uranium Disposition Project. The project includes continued operation of the H-Canyon facilities for several years to process aluminum-clad HEU SNF and other HEU-bearing materials that would provide LEU for this expanded program with TVA.

H Canyon and HB Line supported FB-Line and F Area Materials Storage deinventory by receiving and stabilizing or dispositioning plutonium-containing materials.

Processing of the pre-existing neptunium solutions in HB Line was completed in September 2006. The pre-existing neptunium solutions, which were stored in H Canyon, were converted to an oxide form in HB Line's Phase II facility and are stored in K-Area. The material will be shipped to Idaho for use in future plutonium-238 production efforts.

At the end of FY 2006, H Canyon had repackaged the contents of 25 large (12 feet by 7 feet by 18 feet) TRU solid waste boxes into smaller waste boxes that meet the certification requirements for shipment to WIPP. This activity will continue in FY 2007.

Dissolution of the last SRS fuel for HEU processing in H Canyon was completed in July 2006. The facility has processed all HEU (10,093 kilograms) scheduled through the contract period. This marks the end of the SRS fuel cycle material to be processed at SRS, thereby ending an era that began in July 1959.

HB-Line successfully supported the safe repackaging of 201 plutonium-contaminated scrap items and transferred the items to H-Canyon for final disposition.

HB-Line successfully completed the 3rd Level Ventilation Restoration Project. This project installed new glovebox exhaust fans, HEPA filter banks, and associated equipment in the 3rd level of HB-Line to redirect facility airflows. The successful installation and startup of this system permitted the isolation of the existing degraded exhaust system.

HB-Line has completed the installation and startup of 3013 container process equipment in the Phase 3 glovebox, enabling the facility to receive and process 3013 scrap materials for safe disposition. The process equipment includes outer and inner 3013 can cutters, a hydraulic shear, and an oxidation furnace.

A revised Double Contingency Analysis has been implemented at HB-Line, which will provide increased flexibility to process plutonium or uranium as metals, alloys, composites, or oxides. The new Double Contingency Analysis also provides increased flexibility for moving multiple fissile items in the facility and expanded the scope of analyzed operations to include 3013 processing in the Phase 3 glovebox.

Nuclear Materials Management

Enhancements to the K Area Complex were a focus area during the year in preparation for expansion of the facility's mission as the only Category I facility at SRS. Activities included:

- Completion of the conversion of the 910B Fan Room into a storage vault for non-3013 materials. More than 200 additional storage positions resulted from this action, and material receipts began in August 2006.

- Completion of defense-in-depth fire protection upgrades through the removal of 75,000 pounds of abandoned tower cables. This action lowered the combustible loading of the facility and was a commitment made by the Secretary of Energy to Congress.

- Implementation of security enhancements to meet threat planning and security guidelines for Category I facilities required interior and exterior facility modifications. Enhanced detection systems and weaponry have been put in place as part of the security strategy. Additional enhancements are planned during the coming year.

- Meeting milestones for Construction Completion and the initiation of Start-Up Testing for the K-Area Interim Surveillance Project. Full operational activities are slated for 2007.

- Shipment of the last 12 (of 1,788) Mark 22 assemblies to H Canyon. Shipping of the cropped fuel assemblies began in February 2004 after a successful K Area Complex effort to remove unwanted materials from each assembly. As a result, the HEU Blend-Down Program was able to minimize waste streams and expedite dissolution times by processing only the desired material from the fuel assembly.

- A revised CD-1 for Container Storage and Stabilization Capability project was approved by the Assistant Secretary for Environmental Management on March 9, 2006.

- 9975 and 3013 storage container surveillances were completed in the F-Area Material Storage facility using the Limited Extent Surveillance capability. All FY 2006 surveillances were completed with no significant container issues being identified. Since the F-Area Material Storage facility has been fully deinventoried in support of the accelerated shutdown of F-Area Material Storage facility, the Limited Extent Surveillance capability no longer exists.

- Sufficient materials were deinventoried from F-Area Material Storage as of August 21, 2006 to allow a safeguards and security downgrade from Category III to Category IV. All remaining materials and sources were removed from F-Area Material Storage by November 30, 2006, and the facility was turned over from Nuclear Materials

Management to F Closure Projects on December 1, 2006, for surveillance and maintenance until the facility is turned over to decontamination and demolition for final disposition.

- F-Area Material Storage facility started up and implemented the Plutonium Alloy Scrap Can Cutting capability during the year. Sixteen 3013 containers were successfully processed through Plutonium Alloy Scrap Can Cutting.

- On August 17, 2006, the Deputy Secretary approved the selection of vitrification as the preferred technology alternative, CD-1A, for the SRS Plutonium Vitrification Project. Conceptual design is now being prepared for this important project, which will establish the capability to prepare for disposition up to 13 metric tons of surplus, non-pit, weapons-usable plutonium without an identified disposition path.

Spent Nuclear Fuel

Spent nuclear fuel is received and stored on site in the L-Area Basin. The spent fuel project operations safely performed work with no lost work days in FY 2006, extending their record to over nine years without a lost work day case and over three years since the last personal contamination. Other risk reduction activities have included:

- The bundling and disposal of legacy SRS uranium-thorium (Mark 50A) assemblies which were then sent to the burial grounds.

- The removal of approximately 300 cubic feet total of activated scrap from the disassembly basin, which along with 5 Airborne Activity Confinement System filter housings were sent to the burial ground trenches.

- The use of 12,000 gallons of legacy contaminated water in C Area as make-up water for the Disassembly Basin rather than handling/processing this water as waste.

- Eighteen casks from foreign and domestic research reactors, containing 407 spent fuel assemblies were successfully received and processed into the L-Area spent nuclear fuel inventory.

- Ninety-one excess casks were shipped from the Receiving Basin for Offsite Fuels facility cask pad in L-Area to Energy Solutions for final disposal; 10 casks remain to be dispositioned as priorities allow.

- Twenty drums and four bundles of spent nuclear fuel were relocated from K-Area to L-Area and placed in the Dry Fuel Storage Area.

- A pilot project was begun with a commercial industry to detritiate the Spent Fuel Project (Spent Fuel Project total inventory of approximately 1,605.9 metric tons of heavy water). Two tons of heavy water has been supplied, along with recombiner media and palladium catalyst-coated alumina pellets, for use on a demonstration project and future DOE use. Initial results are expected in FY 2007.

- The charter of a Heavy Water Focus Group is being pursued, which will consolidate and coordinate information exchange between government and commercial entities involved in the heavy water industry.

Savannah River National Laboratory (SRNL)

In March, DOE designated SRNL as the EM Corporate Laboratory. In this capacity, SRNL will apply its unique expertise and applied technology capabilities to reduce technical uncertainties to assist DOE sites across the nation in meeting cleanup requirements.

SRNL has been leading a three-year, DOE complex-wide project to study nature's own ability to clean chlorinated solvents from the groundwater. That project concluded this year, producing guidance that will help sites across the DOE complex evaluate Monitored Natural Attenuation and Enhanced Attenuation as potential tools for remediating contaminated sites. The national effort involved regulatory agencies from across the country, along with multiple Federal partners and other stakeholders to make it easier to implement new technologies for cost-effective environmental compliance.

SRNL is developing a process to safely immobilize excess plutonium into a glass matrix. This year, SRNL successfully demonstrated this process on a small scale using actual plutonium and on a full scale with

chemical simulants. Since the late 1990s, SRNL has been working with the DOE, SRS, and other national laboratories to safely disposition and dispose of the country's excess plutonium.

SRNL continues to support SRS Liquid Waste Operations by designing, developing, and testing processes and tools for treating waste and sampling tanks. For example, SRNL is developing a rotary micro filter to increase the throughput of radioactive waste processes. Testing showed that this approach could increase the filtration rate by as much as a factor of six, while significantly reducing the overall filter size and improving maintenance access.

Working with Sandia National Laboratories, SRNL has developed a new titanium-based sorbent material that exhibits significantly improved performance for the removal of strontium and actinides, such as plutonium, from some waste streams. This new sorbent may enhance operational capacity in the Actinide Removal Process and the Salt Waste Processing Facility, scheduled to open at SRS in the next few years.

SRNL participated in a variety of tasks in support of TEF startup and continued to provide technology support to enhance Defense Programs operations. At the request of LANL, SRNL designed, fabricated, installed, and tested new hydraulic burst test equipment and methods for testing tritium reservoirs. Data obtained from burst testing is used to track the effects of tritium exposure on the ductility of reservoir material and to provide input data for new reservoir designs. The new equipment and methods allow significant improvement in resolution over previous methods.

Under the direction of the NNSA, SRNL and the Kansas City Plant have teamed to develop two new Radioactive Material Packagings. The 9978 will provide a replacement for Department of Transportation (DOT) packaging that will no longer be authorized after 2008. The 9977 will initially be used to transport two types of radioisotope thermoelectric generators.

High-Level Waste

The Defense Waste Processing Facility (DWPF) produced 246 canisters with waste loadings as high as 42 percent and an average waste loading of around 38.5 percent (versus 28.1 percent historical waste loading). The increased waste loading will result in about 1,000 fewer canisters over the life of the facility and a savings to taxpayers of about $1 billion. As of December 4, 2006, DWPF had produced 2,222 canisters since operations began in 1996.

Saltstone Facility modifications to support interim salt processing were completed, and the facility received approval to resume normal operations in late CY 2006. Approval to begin salt processing operations is expected in early 2007.

Construction of Glass Waste Storage Building No. 2 was completed in June 2006, and the facility started up in July 2006. The building has the capacity to store 2,340 canisters and provide storage capabilities until 2015.

Construction of the Actinide Removal Process and Modular Caustic Side Solvent Extraction Unit were completed in CY 2006. Startup testing for both units is currently in progress. The mission of Actinide Removal Process and Modular Caustic Side Solvent Extraction Unit is to reduce the level of strontium-90, cesium-137, and actinides in the decontaminated salt solution stream that is to be dispositioned as Saltstone grout.

The enhanced preliminary design for the Salt Waste Processing Facility (SWPF) was completed on schedule in September 2006 to incorporate PC-3 design requirements. This will be followed by a formal 35 percent design. Presently, the project is developing a Critical Decision 2 baseline cost and schedule package. The SWPF is a salt waste pre-treatment facility, currently scheduled to commence hot operations in September 2011.

Defense Waste Processing Facility

Low Level Waste Shipments

Solid Waste

In FY 2006, SRS maintained its accelerated TRU waste shipment program, dispositioning over 615 cubic meters of legacy TRU waste and successfully completing 115 shipments to WIPP. At this rate, SRS expects to complete shipment of its legacy drummed waste in 2008.

All legacy hazardous waste and all legacy mixed LLW, with the exception of PUREX solvent, was dispositioned in CY 2006. Continuing shipment of the legacy PUREX solvent for treatment and disposal remains on schedule to complete by September 30, 2007.

Deactivation and Decommissioning

Decommissioning was completed for 63 gold metric facilities during FY 2006, representing a reduction of 900,000 square feet. This increases the total number of gold metric facilities decommissioned through FY 2006 to 236 facilities.


Before


After

Demonstration Waste Incinerator

Decommissioning was also completed for the Demonstration Waste Incinerator (Beta-Gamma Incinerator), which represented approximately 4,500 square feet. This facility was used to demonstrate incineration of suspect beta-gamma contaminated waste.

Decommissioning of the final Heavy Water facility in D Area was completed in June 2006, representing a reduction of more than 15,000 square feet.


Before


After

420-D Heavy Water Facility

Decommissioning of all target facilities in A and M Areas was completed in 2006. Some soil and groundwater characterization and remedial activities were performed in parallel with M Area decommissioning.

Decommissioning of the 247-F Fuel Fabrication Facility was completed in 2006. The 247-F Facility was the first complex, contaminated glovebox line facility decommissioned at Savannah River. Decommissioning was completed in March 2006, eight months ahead of schedule. Additional noteworthy accomplishments in F Area include completion of 211-F isolation and decommissioning of 211-3F, both of which were complex nuclear facilities contaminated with various hazardous materials.


Before

After

247-F Fuel Fabrication Facility

Planning actions commenced for deactivation and decommissioning of the F Area Material Storage Facility. The plutonium-238 holdup in this facility makes it one of the highest-risk facilities at Savannah River. The F Area Material Storage Facility Consolidated Hazard Analysis and Risk Management Plan are being developed to analyze hazards and risks associated with an in-situ closure option and decommissioning to building slab option. These documents will serve as project management tools for planning the deactivation and decommissioning effort for the F Area Material Storage Facility.

R-Reactor Disassembly Basin water was removed (evaporated and removed via tanker) in support of a CERCLA Non-Time Critical Removal Action. This action places the basin in a condition that will support the R-Area Operable Unit Closure.

Preparations were initiated for the deactivation of P-Reactor. A life safety plan for occupation of the building has been developed. Implementation of the plan is in progress and includes temporary lighting installation and hazard abatement activities.

N. Y-12 Site Office (YSO)

The Y-12 Site Office (YSO) was established at Oak Ridge with the responsibility for operation of the Y-12 facilities. The national security mission for DOE-OR is carried out at the Y-12 National Security Complex (NSC), formerly known as the Oak Ridge Y-12 Plant. Programs at Y-12 include manufacturing and reworking nuclear weapon components, dismantling nuclear weapon components returned from the national arsenal, serving as the nation's storehouse of special nuclear materials, and providing special production support to other programs. Y-12 is operated by BWX Technologies, Inc. (BWXT) Y-12 for DOE. Recently, management responsibility for operations at Y-12 transferred to YSO under the NNSA. Safety accomplishments and activities at Y-12 during 2006 are summarized in the following sections.

Modernization, Infrastructure, and Production

Project Management initiatives continue at the Y-12 NSC to support modernization, infrastructure, and productions. A summary of these activities across the Y-12 site are as follows.

The Uranium Processing Facility (UPF) project, a facility to support the Complex 2030 vision, underwent an Independent Project Review in January 2006. Actions to address the team's concerns and recommendations were completed or are being resolved. The project team continues to work with NNSA Headquarters toward Critical Decision 1 approval.

Construction of the Highly Enriched Uranium Materials Facility continued in 2006. QA issues surfaced in January, temporarily suspending activities. As a result, a joint BWXT and Bechtel Corporate Assessment Team were assembled by QA to conduct a review of quality programs and procedures and construction and design details. The review was conducted in February and identified a broad range of needs to address QA issues that addressed not only the Highly Enriched Uranium Materials Facility Project, but also sitewide project and maintenance efforts. A recovery team developed multiple initiatives to ensure that specific controls were in place for the Highly Enriched Uranium Materials Facility, and construction work resumed in the spring.

In late 2005, Y-12 leadership and elected officials broke ground on two new facilities with private-sector financing totaling more than $125 million. These facilities, the New Hope Building and the Jack Case Center are privately financed, total approximately 500,000 square feet, and will house approximately 1,500 employees who are currently located in more than 20 separate buildings. Construction of these new facilities will allow the complex to vacate and tear down these obsolete, inefficient facilities built in the 1940s, helping to reduce the footprint.

The Kathabar Replacement projects in Buildings 9204-2 and 9204-2E were completed ahead of schedule

View of the Highly Enriched Uranium Materials Facility Under Construction at Y-12

View of the Privately Financed Jack Case Center Under Construction at Y-12

and under budget in June 2006. Additionally, the project for relocation of Quality Evaluation continued with the movement and reassembly of a major glovebox. This was followed by the removal and relocation of stored enriched uranium from Building 9204-4, saving $17 million in the short term in security costs, and about $137 million between now and 2018, when the Uranium Processing Facility comes online.

Other line item projects ongoing at the Y-12 NSC include the Potable Water System Upgrades Project, Compressed Air Upgrade Project, Steam Plant Life Extension Project, Beryllium Capability Project, and Security Improvement Project.

The First Production Units for the B61 Mod 7 and Mod 11 Alt 357 Programs were completed. First Production Units are major programmatic milestones signifying the end of pre-production activities and the initiation of production for the nuclear stockpile.

To support operations, the disassembly glovebox, electron beam welder, metalworking, and dryer/mold loading readiness tasks were completed.

The Oxide Conversion Facility (OCF) began operations (first of this type operation in 14 years), and the Reduction Operation utilized the OCF product to produce metal buttons.

The Infrastructure Reduction program reached a milestone by demolishing its one millionth square foot. Through 2006, Infrastructure Reduction had demolished 258 facilities totaling 1,001,429 square feet. Roofing activities continued to be an area of focus: the 9201-1 Roofing Replacement Project was completed in December 2005, and the Roofing Repair and Replacement project was completed in March 2006. Together, these projects replaced over 55,000 square feet of roofing and addressed significant safety-related issues by completing important structural repairs to Building 9202. This brings the total area of roof replacements performed at Y-12 since the inception of the Facilities and Infrastructure Recapitalization Program to 13 acres and the total amount invested in roofing activities to $23 million.

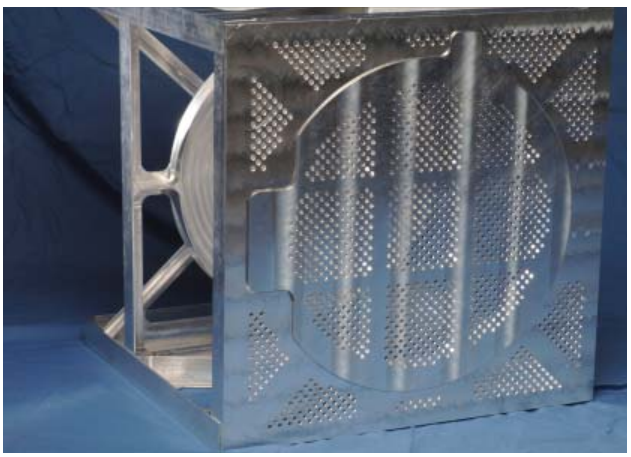
Newly Generated Waste was congressionally transferred to NNSA in November 2005. Although unexpected, BWXT initiated management of this scope through execution of a Master Purchase Order with Bechtel Jacobs Company. Final transition of complete authority for ownership transferred from EM to NNSA YSO in February 2006. Disposition and treatment services continued uninterrupted for FY 2006, with established disposal milestones met for mixed low level, hazardous, and low level waste.

The installation of the new meteorological tower was completed in August. The subcontractor completed all interconnections, and the data logger is operational. The final test and checkout of the fiber-optic communications were completed in September 2006.

Risk Reduction Accomplishments

The campaign to ship ingots from Y-12 to Nuclear Fuel Services, Inc., was completed. This is a significant milestone for the Off-Specification Fuel Program at Y-12. The campaign began in FY 2003 and reduced surplus storage needs at Y-12 by approximately 1000 6M containers.

Process Engineering and General Manufacturing Production collaborated on the design and manufacture of an alternate birdcage for storing special nuclear material. This prototype birdcage makes use of seven machined components and requires less than 400 inches of welding to assemble. The seven components are designed to be machined out of aluminum plate



Prototype of the New Monolithic Birdcage at Y-12

using high-speed machining technology, which further reduces the fabrication cost.

In support of the Global Threat Reduction Initiative, Y-12 completed three missions to repatriate high risk nuclear materials to the United States: approximately 3.7 kilograms of HEU was recovered from Comision Nacional de Energia Atomica's Constituyentes Atomic Center, Argentina; approximately 23.16 kilograms of U.S. origin HEU was returned from the Atomic Energy of Canada Limited, Canada's Chalk River facility; and approximately 15.2 kilograms of HEU was returned from CERCA in France.

Y-12 completed a Facility Risk Review of the building 9212 Complex. This review focused on the reduction of material at risk and implementation of practical facility modifications deemed prudent and necessary to ensure continued safe operations of the 9212 Complex during the expected period of design and construction of the UPF.

The Tower Shielding Facility–Systems for Nuclear Auxiliary Power reactor was shipped to ORNL in June 2006, for draining of the sodium-potassium (NaK) coolant and removal of the HEU fuel. After removal, the fuel was packaged and returned to Y-12 in July 2006.

Y-12's first Nuclear Regulatory Commission Certificate of Compliance was received in April for the Y-12-designed ES-3100 Type B nuclear shipping package, which is currently in production. The ES-3100 will replace the DOT 6M Type B nuclear shipping package with improved transportation efficiencies and safety.

More than 6700 containers of hazardous chemicals, totaling about 17 tons, were successfully removed from Y-12 during the past year.

Safety Accomplishments

The Y-12 held its sixth annual Safety Expo in June. About 10,000-11,000 visitors toured some 100 safety-related displays of Y-12 and local organizations.

Construction direct-hire craft, staff, and escorts worked 1,223,996 hours without a lost time injury and 222 safe days without a recordable injury. The last lost workday for Construction direct-hire occurred in April 2004, and the last recordable injury occurred in February 2006.

In conjunction with the loading of the first Rackable Can Storage Box, Storage, Transfer, and Material Movement Project cards were printed and stored with the Rackable Can Storage Boxes. The Storage, Transfer, and Material Movement Project card includes a sufficient amount of information to clearly determine compliance with applicable nuclear criticality safety loading limits.

As an ongoing requirement of 10 CFR 835, Y-12 received reaccreditation for its Internal and External Dosimetry programs under the DOE Laboratory Accreditation Program for personnel monitoring.

Y-12 is working toward year 14 of operating without a reportable commercial motor vehicle accident. This is significant in that most accidents occur within the first few miles of the site, and the fact that the Y-12 shipping and receiving location is at an offsite location.

Y-12 showed significant success improving the Recordable and Safety Index rates for CY 2006 compared to 2005. The Safety Index was reduced 41 percent from a rate of 10.94 in 2005 to a rate of 6.43 in 2006. The Recordable Injury/Illness rate was reduced 41 percent from a rate of 1.76 in 2005 to a rate of 1.03 in 2006. In addition, the site achieved a 40 percent reduction in the Lost Workday (Away) rate, from 0.40 in 2005 to 0.24 in 2006.

In support of DOE 10 CFR Part 830, *Nuclear Safety Management*, the safety analysis report and technical safety requirements were completed for the 9212 Complex, and the approving YSO safety evaluation report was issued in July.

In October, the Deputy Secretary approved the accreditation of the Y-12 Site Office's Training and Qualification Program for Federal Employees, becoming the first organization across the DOE complex to achieve this level of certification. This certification will be maintained for four years before seeking renewal.

In August, the CDNS office evaluated Y-12 in 18 functional areas regarding site nuclear safety performance. Each area was judged to meet expectations, and two areas were judged to exceed expectations. Thus, the Y-12 Site Office nuclear safety oversight and assessment processes are effective in all functional areas.

V. Other Board Interface Activities

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

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

A. Coordination of Board Review of Department Safety Directives

One of the Board's significant responsibilities is to review and evaluate the Department's safety directives and standards that apply to the design, construction, operation, and decommissioning of Department's defense nuclear facilities. The Board reviews the body of the Department's directives (including rules, policies, notices, orders, manuals, handbooks, guides, and standards) that it has identified as "of interest" to the Board due to their applicability to pubic health and safety at the Department's defense nuclear facilities. Whenever the Department develops changes to the identified directives or identifies new directives potentially "of interest" to the Board, the Board is provided an opportunity to review and comment on the changes prior to approval of the changes by Department management. The Departmental Representative's Office coordinates this review process with the Board to ensure that the Board and its staff are notified of each change and given an opportunity for review and comment prior to issuance or re-issuance of the directives. Appendix A provides a listing of the orders identified by the Board as "of interest" and a listing of Departmental safety directives "of interest" to the Board that were changed in 2006.

B. Briefings, Site Visits, and Other Board Interactions

The Department, the Board, and the Board's staff are in regular contact to identify and resolve safety issues at the Department's defense nuclear facilities. The Department provides briefings to the Board on a regular basis in order to:

- Update the Board on the Department's progress toward resolving issues identified in Board recommendations
- Update the Board on the Department's safety initiatives
- Update the Board on specific safety issues as requested by the Board.

The Board and the Board's staff regularly visit the Department's defense nuclear facilities to perform reviews of the Department's safety

initiatives, safety facilities, and operations, and to attend briefings at the sites. Appendix B provides a summary of site visits supported by the Department during 2006. In addition, Department personnel conducted numerous teleconferences and video conferences to exchange information and resolve safety issues.

C. Responses to Board Reporting Requirements

The Board communicates with the Department through a variety of channels, including formal recommendations and reporting requirements, letters requesting action and information, and letters providing suggestions and information, such as staff issue reports and trip reports. Communication channels also include Board and Board's staff requests for information, public meetings, briefings and discussions, and site visits. The Board's choice of communication vehicle suggests the level of the Board's concern, with the more formal channels used for clearly-defined safety issues that require prompt attention by Departmental managers. During 2006, the Board issued 27 sets of formal reporting requirements, pursuant to Chapter 21, Section 313(d) of the Atomic Energy Act of 1954 [42 U.S.C. 2286b(d)], as shown in Table 5.A. Table 5.B lists active reporting requirements from prior years. Table 5.C lists the statutory letter commitments completed in 2006. (Tables begin on page V-4.)

D. Board Public Meetings

The Board holds public meetings periodically to review significant safety issues in a public forum. The Board provides advance public notice for these meetings pursuant to the provision of the "Government in the Sunshine Act" (5 U.S.C. 552b). During 2006, the Department supported public meetings conducted by the Board on March 22, 2006, and July 19, 2006, each on the topic of Safety in Design.

E. Secretary Periodic Briefings with the Board Members

The Secretary typically provides periodic briefings to the Board members. The Secretary initiated these briefings in 1994 to facilitate senior-level information exchange on key safety issues. The Secretary, Deputy Secretary, Under Secretaries, and the Departmental Representative typically represent the Department in these periodic reviews.

F. Safety Issues Management System (SIMS)

The Department established a Department-wide commitment management tool, SIMS, in August 1995. Using this tool, the Department has reduced the number of outstanding commitments related to Board recommendations from 694 in August 1995 to 394 in December 2006. The total number of overdue commitments related to Board recommendations has also declined significantly, from 245 in August 1995 to eight in December 2006. In addition to commitments and actions related to Board recommendations, SIMS is also used to manage commitments and actions related to other interactions between the Department and the Board, such as Board requests for action or information and Department commitments in letters to the Board. As of December 2006, the Department is tracking 27 open letter commitments to the Board.

The Departmental Representative conducts qualitative and technical reviews of the Department's implementation plans and other outgoing correspondence to the Board to identify and capture Department commitments. Commitment information identified from these documents is entered into the SIMS database. Monthly summary reports on the status of commitment implementation and completion are distributed to responsible Department managers, points of contact, and Secretarial Officers. Quarterly SIMS reports are also prepared to focus attention where needed. Department personnel can access detailed SIMS information and use various view, sort, and report formats via an on-line, Internet-based user interface.

G. 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 recommendation implementation plans.

In addition, the Department receives and responds to trip reports detailing visits by the Board and the Board's staff to Department facilities. The Department also receives specific requests from the Board and the Board's staff for particular information or action by the Department. Appendix C provides a summary of key correspondence between the Department and the Board for 2006; this summary does not include transmittal of requested information and routine distribution of assessments and evaluations.

The Departmental Representative maintains an information archive of all correspondence, reports, plans, assessments, and transmittals between the Department and the Board on-line at <https://www.hss.doe.gov/deprep>. The web site provides an efficient way for the Department to share information, except information classified as official use only or higher, pertaining to defense nuclear facilities activities.

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

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

H. Interface Manual

The Department, through the Departmental Representative, must ensure that the Department's personnel are provided with appropriate Board interface training and assistance. Training and assistance helps to ensure the integrity of the Department's efforts in resolving safety issues identified by the Board. Additionally, training works to ensure that all affected Departmental elements are actively involved in properly resolving safety issues and meeting recommendation implementation plan commitments, Board reporting requirements, and letter commitments.

The Department's key tools for interface training are DOE Manual 140.1-1B and the Department's periodic interface workshop. DOE Manual 140.1-1B outlines the Department's process used to interface with the Board and the Board's staff. It is available to Departmental personnel through the Departmental Representative's web site or office. The manual was revised by the Department and re-issued in March 2001. The next revision to the manual is expected in 2007. The revision will be followed by an interface workshop.

Table 5.A – Formal Reporting Requirements Established by the Board in 2006

Date	Reporting Requirements	Days to Report
1/6/06	A briefing on the sludge stabilization and packaging system at the K-Basins Closure Project at Hanford	90
1/24/06	A briefing on the steps being taken to address the issues in the review of work planning for Tank W-1A soil characterization and sampling at the Oak Ridge National Laboratory	Before Tank W-1A activities are initiated
3/17/06	A report providing plans for implementing DOE Policy 226.1, *Department of Energy Oversight Policy*, and DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*	90
3/28/06	A report reviewing of Criticality Experiments Facility Project	60
3/29/06	A report providing update on Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems*	60
4/25/06	A report addressing comments regarding the Department's draft Repackaging Prioritization Methodology relative to implementation plan 2005-1, *Nuclear Material Packaging*	30
5/8/06	A report providing a resolution of Board staff comments on draft DOE Manual 441.1, *Nuclear Material Packaging Manual*	30
6/26/06	A report describing plans for staging, assessment, and disposition of a damaged nuclear weapon or improvised nuclear device at the G-Tunnel at the Nevada Test Site	60
6/28/06	A report to address additional guidance in DOE Standard 1027, Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, *Nuclear Safety Analysis Reports*, Change Notice 1	120
6/29/06	A report on Nuclear Criticality Safety Training and Staffing	90
8/17/06	A report on concerns with existing structural cracks in the Device Assembly Facility at the Nevada Test Site	60
8/17/06	A briefing on the path forward for resolving the Board's concerns regarding DOE-NA-STD-3016-2006, *Preparation Guide for U.S. Department of Energy Nuclear Explosive Operation Hazard Analysis Reports*	30
8/17/06	A revised implementation plan for Board Recommendation 2004-2, Active Confinement Systems	30
8/31/06	Provide plans for implementing the safety requirements in DOE Order 226.1, *Implementation of Department of Energy Oversight Policy,* at DOE sites that contain defense nuclear facilities.	30
9/26/06	A report on Nuclear Criticality Safety Program Improvement Plan at the Los Alamos National Laboratory	45
9/27/06	A report on Device Assembly Facility Critical Experiements Facility project safety-related issues	Provided when CD-3 approval request package submitted

Table 5.B – Active Reporting Requirements Established by the Board in Prior Years

Date	Reporting Requirements	Days to Report
9/9/05	Briefing on the contents of the annual revision to the Pantex Nuclear Material Management Program	Annually
8/7/03	Annual report on the Department's Nuclear Criticality Safety Program	Annually

Table 5.C – Statutory Letter Commitments Completed in 2006

Letter #	Commitment Title	Date Completed
SL03-031	Annual Report on Nuclear Criticality Safety Program	2/8/2006
SL05-001	98-2 Monthly Briefings	1/20/2006
	98-2 Monthly Briefings	5/12/2006
	98-2 Monthly Briefings	6/28/2006
SL05-020	Report on Safety Class Confinement System at PF-4	7/12/2006
SL05-021	Develop Comprehensive LANL Fire Protection Strategy	1/12/2006
SL05-026	Briefing – Annual Pit Management Plan Revision	6/8/2006
SL05-030	Bldg. 9212 Modification Report	11/6/2006
SL05-032	DAF Safety Management Programs	4/26/2006
SL05-033	Nuclear Risk Assessment Policy	1/23/2006
SL05-034	Provide report on weapons response guidelines	1/26/2006
SL06-001	EM briefing to Board on K Basins Closure Project	4/5/2006
SL06-003	Provide plans for implementing Oversight Order	6/28/2006
SL06-004	Review of Criticality Experiments Facility Project	6/2/2006
SL06-005	Provide update on 2000-2 Institutionalization	5/26/2006
SL06-006	Repackaging Prioritization Methodology Comments	5/16/2006
SL06-007	Manual M 441.1-1 Board Comments Resolution	6/8/2006
SL06-008	G-Tunnel Report on Staging, Mission, Readiness, etc.	8/22/2006
SL06-009	Report to Address Additional Guidance in STD 1027	10/25/2006
SL06-010	Report on Criticality Safety Training and Staffing	10/20/2006
SL06-011	DOE-NA-STD-3016-2006 Board Comments	9/15/2006
SL06-012	2004-2 Revised IP safety impacts	11/22/2006
SL06-013	DAF report on concerns with existing cracks	9/21/2006
SL06-014	EM provide gap analyses for O 226 implementation	8/23/2006
	NA provide gap analyses for O 226 implementation	9/14/2006
SL06-016	NCS Program at LANL	11/2/2006
SL06-017	Report on DAF CEF Safety-related issues at CD-3	12/8/2006

APPENDIX A

Department Safety Orders and Directives "of Interest" to the Board

Table A.1 – Group 1 – Currently Active Orders of Interest to the Board

Order Number	Title
DOE O 151.1C	Comprehensive Emergency Management System
DOE O 210.2	DOE Corporate Operating Experience Program
DOE O 225.1A	Accident Investigations
DOE O 226.1	Implementation of Department of Energy Oversight Policy
DOE O 231.1A, Chg 1	Environment, Safety, and Health Reporting
DOE O 251.1B	Departmental Directives Program
DOE O 252.1	Technical Standards Program
DOE O 341.1	Federal Employee Health Services
DOE O 360.1B	Federal Employee Training
DOE O 413.3A	Program and Project Management for the Acquisition of Capital Assets
DOE O 414.1C	Quality Assurance
DOE O 420.1B	Facility Safety
DOE O 425.1C	Startup and Restart of Nuclear Facilities
DOE O 430.1B	Real Property Asset Management
DOE O 433.1	Maintenance Management Program for DOE Nuclear Facilities
DOE O 435.1, Chg 1	Radioactive Waste Management
DOE O 440.1A	Worker Protection Management for DOE Federal and Contractor Employees
DOE O 442.1A	Department of Energy Employee Concerns Program
DOE O 450.1, Chg 2	Environmental Protection Program
DOE O 451.1B, Chg 1	National Environmental Policy Act Compliance Program
DOE O 452.1C	Nuclear Explosive and Weapon Surety Program
DOE O 452.2C	Nuclear Explosive Safety
DOE O 452.3	Management of the Department of Energy Nuclear Weapons Complex
DOE O 460.1B	Packaging and Transportation Safety
DOE O 460.2A	Departmental Materials Transportation and Packaging Management
DOE O 461.1A	Packaging and Transfer or Transportation of Materials of National Security Interest

Table A.1 – Group 1 – Currently Active Orders of Interest to the Board, Continued

Order Number	Title
DOE O 470.2B	Independent Oversight and Performance Assurance Program
DOE O 470.4	Safeguards and Security
DOE O 541.1B	Appointment of Contracting Officers and Contracting Officer's Representatives
DOE O 5400.5, Chg 2	Radiation Protection of the Public and the Environment
DOE O 5480.4, Chg 4	Environment Protection, Safety, and Health Protection Standards
DOE O 5480.19, Chg 2	Conduct of Operations Requirements for DOE Facilities
DOE O 5480.20, Chg 1	Personnel Selection, Qualification, Training and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities
DOE O 5480.30, Chg 1	Nuclear Reactor Safety Design Criteria
DOE O 5530.1A	Accident Response Group
DOE O 5530.2	Nuclear Emergency Search Team
DOE O 5530.3, Chg 1	Radiological Assistance Program
DOE O 5530.4	Aerial Measuring System
DOE O 5530.5, Chg 1	Federal Radiological Monitoring and Assessment Center
DOE O 5660.1B	Management of Nuclear Materials

Table A.1 – Group 2 – National Nuclear Security Administration Policy Letters

Order Number	Title
None Issued to Date	Documents will be added to this table if NNSA issues Policy Letters related to safety.

Table A.1 – Group 3 – Archived or Deleted Orders of Interest to the Board Cited in Current Contracts

Order Number	Title
DOE O 210.1	Performance Indicators and Analysis of Operations Information
DOE O 232.1A	Occurrence Reporting and Processing of Operational Information
DOE O 473.1	Physical Protection Program
DOE O 474.1A	Control and Accountability of Nuclear Materials
DOE O 1300.2A	Department of Energy Technical Standards Program
DOE O 1360.2B	Unclassified Computer Security Program

Table A.1 – Group 3 – Archived or Deleted Orders of Interest to the Board Cited in Current Contracts, Continued

Order Number	Title
DOE O 1540.2, Chg 1	Hazardous Material Packaging for Transport – Administrative Procedures
DOE O 1540.3A	Base Technology for Radioactive Material Transportation Packaging Systems
DOE O 3790.1B	Federal Employee Occupational Safety and Health Program
DOE O 4330.4B	Maintenance Management Program
DOE O 4700.1	Project Management System
DOE O 4700.4	Project Manager Certification
DOE O 5000.3B, Chg 1	Occurrence Reporting and Processing of Operations Information
DOE O 5400.1	General Environmental Protection Program
DOE O 5400.2A Chg 1	Environmental Compliance Issue Coordination
DOE O 5400.3	Hazardous and Radioactive Mixed Waste Program
DOE O 5400.4	Comprehensive Environmental Response, Compensation, and Liability Act Requirements
DOE O 5480.21	Unreviewed Safety Questions
DOE O 5480.22, Chg 2	Technical Safety Requirements
DOE O 5480.23, Chg 1	Nuclear Safety Analysis Reports
DOE O 5440.1E	National Environmental Policy Act Compliance Program
DOE O 5480.1B Chg 5	Environmental, Safety and Health Program for DOE Facilities
DOE O 5480.3	Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes
DOE O 5480.5, Chg 2	Safety of Nuclear Facilities
DOE O 5480.6	Safety of Department of Energy-Owned Nuclear Reactors
DOE O 5480.7A	Fire Protection
DOE O 5480.8A Chg 2	Contractor Occupational Medical Program
DOE O 5480.9A	Construction Safety and Health Program
DOE O 5480.10	Contractor Industrial Hygiene Program
DOE O 5480.11	Radiation Protection for Occupational Workers
DOE O 5480.15	Department of Energy Laboratory Accreditation Program for Personnel Dosimetry
DOE O 5480.17	Site Safety Representatives

Table A.1 – Group 3 – Archived or Deleted Orders of Interest to the Board Cited in Current Contracts, Continued

Order Number	Title
DOE O 5480.18B	Nuclear Facilities Training Accreditation Program
DOE O 5480.24	Nuclear Criticality Safety
DOE O 5480.25	Safety of Accelerator Facilities
DOE O 5480.26	Trending and Analysis of Operations Information Using Performance Indicators
DOE O 5480.28	Natural Phenomena Hazards Mitigation
DOE O 5480.29	Employee Concerns Management System
DOE O 5480.31	Startup and Restart of Nuclear Facilities
DOE O 5481.1B, Chg 1	Safety Analysis and Review System
DOE O 5482.1B, Chg 1	Environment, Safety, and Health Appraisal Program
DOE O 5483.1A	Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities
DOE O 5484.1B	Environmental Protection, Safety and Health Protection Information Reporting Requirements
DOE O 5500.1B	Emergency Management System
DOE O 5500.2B, Chg 1	Emergency Categories, Classes, and Notification and Reporting Requirements
DOE O 5500.3A, Chg 1	Planning and Preparedness for Operational Emergencies
DOE O 5500.4	Public Affairs Policy and Planning Requirements for Emergencies
DOE O 5500.7B	Emergency Operating Records Protection Program
DOE O 5500.10	Emergency Readiness Assurance Program
DOE O 5600.1	Management of the Department of Energy Weapon Program and Weapon Complex
DOE O 5610.10	Nuclear Explosive and Weapon Safety Program
DOE O 5610.11	Nuclear Explosive Safety
DOE O 5610.12	Packaging and Offsite Transportation of Nuclear Components, and Special Assemblies Associated with the Nuclear Explosive and Weapon Safety Program
DOE O 5632.1C	Protection and Control of Safeguards and Security Interests
DOE O 5632.11	Physical Protection of Unclassified Irradiated Reactor Fuel in Transit
DOE O 5700.6C, Chg 1	Quality Assurance
DOE O 5820.2A	Radioactive Waste Management
DOE O 6430.1A	General Design Criteria

Table A.1 – Group 4 – Related Documents Setting Forth Safety-related Requirements or Guidance

Document Number	Title
DOE SEN-35-91	Nuclear Safety Policy
DOE M 140.1-1B	Interface with the Defense Nuclear Facilities Safety Board
DOE P 141.2	Public Participation and Community Relations
DOE G 151.1-1 series	Emergency Management Guide Volumes 1 through 7
DOE N 153.2	Connectivity to National Atmospheric Release Advisory Center (NARAC)
DOE G 200.1-1 series	Software Engineering Methodology Guide Chapters 1 through 10
DOE G 225.1A-1	Implementation Guide for Use with DOE Order 225.1 Accident Investigations
DOE P 226.1	Department of Energy Oversight Policy
DOE M 231.1-1A, Chg 1	Environment, Safety and Health Reporting Manual
DOE G 231.1-1	Occurrence Reporting and Performance Analysis Guide
DOE M 231.1-2	Occurrence Reporting and Processing of Operations Information
DOE G 231.1-2	Occurrence Reporting Causal Analysis Guide
DOE P 251.1A	Directives System Policy
DOE M 251.1-1B	Directives System Manual
DOE G 252.1-1	Technical Standards Program Guide
DOE G 341.1-1	Guide on Federal Employee Occupational Medical Programs
DOE G 341.1-2	Guide on Federal Employee Assistance Programs
DOE M 360.1-1B	Federal Employee Training Manual
DOE P 410.1A	Promulgating Nuclear Safety Requirements
DOE P 411.1	Safety Management Functions, Responsibilities, and Authorities Policy
DOE M 411.1-1C	Safety Management Functions, Responsibilities, and Authorities Manual
DOE P 413.1	Program and Project Management Policy for the Planning, Programming, Budgeting, and Acquisition of Capital Assets
DOE M 413.3-1	Project Management for the Acquisition of Capital Assets
DOE G 414.1-1A	Management Assessment and Independent Assessment Guide
DOE G 414.1-2A	Quality Assurance Management System Guide for Use with 10 CFR 830.120 and DOE Order 414.1

Table A.1 – Group 4 – Related Documents Setting Forth Safety-related Requirements or Guidance, Continued

Document Number	Title
DOE G 414.1-3	Suspect/Counterfeit Items Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE O 414.1B, Quality Assurance
DOE G 414.1-4	Safety Software Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE O 414.1C, Quality Assurance
DOE G 414.1-5	Corrective Action Program Guidance
DOE G 420.1-1	Nonreactor Nuclear Safety Design Criteria and Explosive Safety Criteria Guide for Use with DOE Order 420.1 Facility Safety
DOE G 420.1-2	Guide for Mitigation of Natural Phenomena Hazards for DOE Nuclear Facility and Non-Nuclear Facilities
DOE G 421.1-1 series	Criticality Safety Good Practices Program Guide for DOE Nonreactor Nuclear Facilities
DOE G 421.1-2	Implementation Guide for Use in Developing Documented Safety Analyses to Meet Subpart B of 10 CFR 830
DOE G 423.1-1	Implementation Guide for Use in Developing Technical Safety Requirements
DOE G 424.1-1A	Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements
DOE P 426.1	Federal Technical Capability Policy for Defense Nuclear Facilities
DOE M 426.1-1A	Federal Technical Capability Manual
DOE P 430.1	Land and Facility Use Planning
DOE G 430.1-2	Implementation Guide for Surveillance and Maintenance During Facility Transition Disposition
DOE G 430.1-3	Deactivation Implementation Guide
DOE G 430.1-4	Decommissioning Implementation Guide
DOE G 430.1-5	Transition Implementation Guide
DOE G 433.1-1	Nuclear Facility Maintenance Management Program Guide for Use with DOE Order 433.1
DOE M 435.1-1, Chg 1	Radioactive Waste Management Manual
DOE G 435.1-1 series	Implementation Guide for Use with DOE Manual 435.1-1 Chapters 1 through 4
DOE M 440.1-1A	DOE Explosives Safety Manual
DOE G 440.1-8	Implementation Guide for Use with 10 CFR Part 851, Worker Safety and Health Programs
DOE G 440.1-x series	Guides for Use with DOE Order 440.1 Volume 1-5, 7A
DOE P 441.1	DOE Radiological Health and Safety Policy

Table A.1 – Group 4 – Related Documents Setting Forth Safety-related Requirements or Guidance, Continued

Document Number	Title
DOE G 441.1-x series	Guides for Use with 10 CFR 835 Volumes 1 through 13
DOE G 442.1-1	DOE Employee Concerns Program Guide
DOE P 442.1	Differing Professional Opinions on Technical Issues
DOE M 442.1-1	Differing Professional Opinions Manual for Technical
DOE G 450.1-x series	Implementation Guide for Use with DOE Order 450.1 Volumes 1A, 2, and 4
DOE P 450.2A	Identifying, Implementing, and Complying with ES&H Requirements
DOE P 450.3	Authorizing Use of the Necessary and Sufficient Process for Standards-Based Environment, Safety and Health Management
DOE M 450.3-1	DOE Closure Process for Necessary and Sufficient Sets of Standards
DOE G 450.3-x series	Documentation for Work Smart Standards Applications Volumes 1 Through 3
DOE P 450.4	Safety Management System Policy
DOE M 450.4-1	Integrated Safety Management System Manual
DOE G 450.4-1B series	Integrated Safety Management System Guide Volumes 1 through 2
DOE P 450.7	Environment, Safety and Health (ESH) Goals
DOE M 452.2-1	Nuclear Explosive Safety
DOE P 454.1	Use of Institutional Controls
DOE G 454.1-1	Institutional Controls Implementation Guide for Use with DOE P 454.1, Use of Institutional Controls
DOE P 455.1	Use of Risk-Based End States
DOE G 460.1-1 series	Implementation Guide for Use with DOE Order 460.1A, Packaging and Transportation Safety
DOE G 460.2-1	Implementation Guide for Use with DOE Order 460.2 Departmental Materials Transportation and Packaging Management
DOE M 460.2-1	Radioactive Material Transportation Practices Manual
DOE M 461.1-1, Chg 1	Packaging and Transfer of Materials of National Security Interest Manual
DOE M 470.4-6, Chg 1	Nuclear Material Control and Accountability
10 CFR 820	Procedural Rules for DOE Nuclear Activities
10 CFR 830, Subpart A	Quality Assurance Requirements

Table A.1 – Group 4 – Related Documents Setting Forth Safety-related Requirements or Guidance, Continued

Document Number	Title
10 CFR 830, Subpart B	Nuclear Safety Management
10 CFR 835	Occupational Radiation Protection
10 CFR 851	Worker Safety and Health Program
48 CFR 970.5204-2	Laws, Regulations, and DOE Directives
48 CFR 970.5215-3	Conditional Payment of Fee, Profit, and other Incentives – Facility Management Contracts
48 CFR 970.5223-1	Integration of Environment, Safety, and Health Into Work Planning and Execution
Various	DOE Handbooks and Technical Standards cited in Orders and related documents of interest to the Board as listed in the tables, above.

Table A.2 – Department Safety-related Directives Coordinated with the Board Staff and Issued in 2006

Order Number	Title	Date Issued
DOE G 440.1-8	Implementation Guide for Use with 10 CFR Part 851, Worker Safety and Health Programs	12/27/2006
DOE M 442.1-1	Differing Professional Opinions Manual for Technical Issues Involving Environment, Safety, or Health	11/16/2006
DOE P 442.1	Differing Professional Opinions	11/16/2006
DOE M 450.4-1	Integrated Safety Management System Manual	11/01/2006
DOE-STD-1175-2006	Senior Technical Safety Manager Functional Area Qualification Standard	10/30/2006
DOE-HDBK-1139/2-2006	Chemical Management Handbook (Volume 2 of 3)	8/31/2006
DOE O 251.1B	DOE Directives Program	8/16/2006
DOE P 251.1A	Directives Program Policy	8/16/2006
DOE M 251.1-1B	DOE Directives Program Manual	8/16/2006
DOE M 470.4-6, Chg 1	Nuclear Material Control and Accountability	8/14/2006
DOE O 413.3A	Program and Project Management for the Acquisition of Capital Assets	7/28/2006
DOE G 424.1-1A	Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements	7/24/2006

Table A.2 – Department Safety-related Directives Coordinated with the Board Staff and Issued in 2006, Continued

Order Number	Title	Date Issued
DOE O 210.2	DOE Corporate Operating Experience Program	6/12/2006
DOE O 452.2C	Nuclear Explosive Safety	6/12/2006
DOE M 452.2-1	Nuclear Explosive Safety Manual	6/12/2006
DOE-HDBK-1139/1-2006	Chemical Management, Volume 1 of 3	5/31/2006
DOE-STD-3016-2006	Hazard Analysis Reports for Nuclear Explosive Operation	5/31/2006
DOE-STD-1063-2006	Facility Representatives	4/30/2006
DOE-STD-3009-94 CN3	Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analysis, Change No. 3	3/31/2006
DOE G 414.1-5	Corrective Action Program Guide	3/02/2006
DOE-HDBK-1188-2006	Glossary of Environment Safety and Health Terms	1/31/2006
DOE M 440.1-1A	DOE Explosives Safety Manual	1/09/2006

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest"

Series 100—Leadership/Management/Planning

DOE O 151.1C, *Comprehensive Emergency Management System*

Establishes policy, assigns, and describes roles and responsibilities for the DOE Emergency Management System. The Emergency Management System provides the framework for development, coordination, control, and direction of all emergency planning, preparedness, readiness assurance, response, and recovery actions.

Series 200—Information and Leadership

DOE O 210.2, *DOE Corporate Operating Experience Program*

Establishes a DOE wide program for management of operating experience to prevent adverse operating incidents and to expand the sharing of good work practices among DOE sites.

DOE O 225.1A, *Accident Investigations*

Prescribes requirements and responsibilities related to the Department's accident investigation program. It provides an organized and proven methodology for effectively and efficiently conducting Type A and Type B accident investigations.

DOE O 226.1, *Implementation of Department of Energy Oversight Policy*

Provides direction for implementing Department of Energy (DOE) P 226.1, Department of Energy Oversight Policy, which establishes DOE policy for assurance systems and processes established by DOE contractors and oversight programs performed by DOE line management and independent oversight organizations.

DOE O 231.1A Chg 1, *Environment, Safety, and Health Reporting*

Ensures timely collection, reporting, analysis, and dissemination of information on environment, safety, and health issues as required by law or regulations or as needed to ensure that the Department of Energy (DOE) and National Nuclear Security Administration are kept fully informed on a timely basis about events that could adversely affect the health and safety of the public or the workers, the environment, the intended purpose of DOE facilities, or the credibility of the Department.

DOE O 251.1B, *Departmental Directives Program*

Establishes requirements for the development, coordination, and review of certain internal Directives System documents (Policies, Orders, Notices, Manuals, and Guides.) This ensures issuance of clear, succinct, cost-effective, and outcome-oriented Directives System documents; early involvement of affected organizations; and timely development, coordination, and issuance of Directives System documents.

DOE O 252.1, *Technical Standards Program*

Promotes the use of voluntary consensus standards by the DOE, provides DOE with the means to develop needed technical standards, and manages overall technical standards information, activities, issues, and interactions. DOE Technical Standards cover performance-based or design-specific technical specifications and related management systems practices, and span classification of components; delineation of procedures; specification of materials, products, performance, design, or operations; and definitions of terms or measurements of quality and quantity in describing materials, products, systems, services, or practices.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

Series 300—Human Resources

DOE O 341.1, *Federal Employee Health Services*

Established requirements and responsibilities for occupational medical, employee assistance, and workers' compensation programs for Federal employees.

DOE O 360.1B, *Federal Employee Training*

Establishes requirements and assigns responsibilities for DOE Federal employee training, education, and development under the Government Employees Training Act of 1958. The objective is to improve workforce performance related to the mission and strategic objectives of DOE through a cyclical program of training planning, needs analysis and assessment, design, development, implementation, and evaluation.

Series 400—Work Process

DOE O 413.3A, *Program and Project Management for the Acquisition of Capital Assets*

Provides the Department of Energy, including the National Nuclear Security Administration, project management direction for the acquisition of capital assets that are delivered on schedule, within budget, and fully capable of meeting mission performance and environmental safety and health standards.

DOE O 414.1C, *Quality Assurance*

Establishes quality process requirements to be implemented under a QA program (QAP) for the control of suspect/counterfeit items (S/CIs), safety issue corrective actions, and safety software. Ensures that Department of Energy (DOE), including National Nuclear Security Administration (NNSA), products and services meet or exceed customers' expectations.

DOE O 420.1B, *Facility Safety*

Establishes facility safety requirements for the Department of Energy, including National Nuclear Security Administration.

DOE O 425.1C, *Startup and Restart of Nuclear Facilities*

Establishes the requirements for the DOE, including the NNSA, for startup of new nuclear facilities and for the restart of existing nuclear facilities that have been shut down. The requirements specify a readiness review process that must, in all cases, demonstrate that it is safe to start (or restart) the applicable facility.

DOE O 430.1B, *Real Property Asset Management*

Provides requirements for planning, acquiring, operating, maintaining, and disposing of physical assets as valuable national resources.

DOE O 433.1, *Maintenance Management Program for DOE Nuclear Facilities*

Defines the program for the management of cost-effective maintenance of DOE nuclear facilities.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE O 435.1 Chg 1, *Radioactive Waste Management*

Ensures that all DOE radioactive waste is managed in a manner that is protective of worker and public health and safety, and the environment.

DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*

Establishes the framework for an effective worker protection program that will reduce or prevent injuries, illnesses, and accidental losses by providing DOE Federal and contractor workers with a safe and healthful workplace. The order requires DOE to implement a written worker protection program and establish written policy, goals, and objectives for the worker protection program.

DOE O 442.1A, *Department of Energy Employee Concerns Program*

Ensures employee concerns related to such issues as the environment, safety, health, and management of DOE and NNSA programs and facilities are addressed through prompt identification, reporting, and resolution of employee concerns regarding DOE facilities or operations in a manner that provides the highest degree of safe operations; free and open expression of employee concerns that results in an independent, objective evaluation; and supplementation of existing processes with an independent avenue for reporting concerns.

DOE O 450.1 Chg 2, *Environmental Protection Program*

Implements sound stewardship practices that are protective of the air, water, land, and other natural and cultural resources impacted by Department of Energy (DOE) operations and by which DOE cost effectively meets or exceeds compliance with applicable environmental; public health; and resource protection laws, regulations, and DOE requirements.

DOE O 451.1B Chg 1, *National Environmental Policy Act Compliance Program*

Establishes DOE internal requirements and responsibilities for implementing the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality Regulations Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and the DOE NEPA Implementing Procedures (10 CFR Part 1021). The goal is to ensure efficient and effective implementation of DOE's NEPA responsibilities through teamwork while controlling the costs and time for the NEPA process.

DOE O 452.1C, *Nuclear Explosive and Weapon Surety Program*

Establishes DOE requirements and responsibilities to ensure safety, security, and control of nuclear explosives and nuclear weapons in the Nuclear Explosive Weapons Surety Program.

DOE O 452.2C, *Nuclear Explosive Safety*

Establishes specific nuclear explosive safety (NES) program requirements to implement the DOE NES standards and other NES criteria for routine and planned nuclear explosive operations.

DOE O 452.3, *Management of the Department of Energy Nuclear Weapons Complex*

Defines and affirms the authorities and responsibilities of the National Nuclear Security Administration (NNSA) for the management of the Department of Energy Nuclear Weapons Complex and emphasizes that the management of the United States nuclear weapons stockpile is the DOE's highest priority for the NNSA and the DOE Nuclear Weapons Complex.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE O 460.1B, *Packaging and Transportation Safety*

Prescribes a comprehensive safety program for the DOE and DOE-contractor packaging and transportation operations.

DOE O 460.2A, *Departmental Materials Transportation and Packaging Management*

Establishes requirements and responsibilities for management of Department of Energy (DOE), including National Nuclear Security Administration (NNSA), materials transportation and packaging to ensure the safe, secure, efficient packaging and transportation of materials, both hazardous and nonhazardous.

DOE O 461.1A, *Packaging and Transfer or Transportation of Materials of National Security Interest*

Establishes requirements and responsibilities for offsite shipments of naval nuclear fuel elements, Category I and Category II special nuclear material (SNM), nuclear explosives, nuclear components, special assemblies, and other materials of national security interest; onsite transfers of naval nuclear fuel elements, Category I and II SNM, nuclear components, special assemblies and other materials of national security interest; and certification of packages for Category I and II SNM, nuclear components, and other materials of national security interest.

DOE O 470.2B, *Independent Oversight and Performance Assurance Program*

Enhances the Department's safeguards and security, cyber security, and emergency management programs and provides the Department and contractor managers, Congress, and other stakeholders with an independent evaluation of the effectiveness of DOE policy and line management performance in safeguards and security, cyber security, emergency management, and other critical functions, as directed by the Secretary.

DOE O 470.4, *Safeguards and Security*

Establishes roles and responsibilities for the Department of Energy Safeguards and Security Program.

Series 5400—Environmental Quality and Impact

DOE O 541.1B, *Appointment of Contracting Officers and Contracting Officer's Representatives*

Establishes procedures governing the selection, appointment, and termination of Department of Energy (DOE)/National Nuclear Security Administration (NNSA) contracting officers and contracting officer representatives. Also, ensures that, within the scope of this Order, only trained, qualified procurement and financial assistance professionals serve as contracting officers.

DOE O 5400.5 Chg 2, *Radiation Protection of the Public and the Environment*

Establishes the standards and requirements for operations of the DOE and DOE contractors with respect to operating its facilities and conducting its activities so that (a) radiation exposures to members of the public are maintained within the established limits and to control radioactive contamination through the management of real and personal property and (b) the environment is protected from radioactive contamination to the extent practical.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE O 5480.4 Chg 4, *Environment Protection, Safety, and Health Protection Standards*

Specifies requirements for the application of the mandatory ES&H standards applicable to all DOE and DOE contractor operations and provides a listing of reference ES&H standards; and identifies the sources of the mandatory and reference ES&H standards.

DOE O 5480.19 Chg 2, *Conduct of Operations Requirements for DOE Facilities*

Provide requirements and guidelines for Departmental Elements, including the National Nuclear Security Administration (NNSA), to use in developing directives, plans, and/or procedures relating to the conduct of operations at DOE facilities. The implementation of these requirements and guidelines should result in improved quality and uniformity of operations.

DOE O 5480.20A Chg 1, *Personnel Selection, Qualification, Training and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities*

Establishes requirements for the development and implementation of contractor-administered training programs that provide consistent and effective training for personnel at DOE nuclear facilities and contains the minimum requirements that must be included in training and qualification programs.

DOE O 5480.30 Chg 1, *Nuclear Reactor Safety Design Criteria*

Establishes requirements for the design of all safety class structures, systems and components of DOE nuclear reactor facilities. Each covered DOE contractor uses these criteria in the review and development of existing and proposed directives, plans, or procedures relating to the design of new and existing DOE nuclear reactor facilities.

Series 5500—Emergency Preparedness

DOE O 5530.1A, *Accident Response Group*

Establishes DOE policy for maintaining a continuing capability to provide immediate response to peacetime accidents and significant incidents involving nuclear weapons or radiological nuclear weapon components.

DOE O 5530.2, *Nuclear Emergency Search Team*

Establishes DOE policy to establish and maintain capabilities for technical response to potential and actual threats and incidents as may be requested by the Lead Federal Agency.

DOE O 5530.3 Chg 1, *Radiological Assistance Program*

Establishes DOE policy, procedures, authorities, and responsibilities for its Radiological Assistance Program. Calls for establishing and maintaining response plans and resources to provide radiological assistance to other Federal agencies, State, local, and tribal governments, and private groups requesting such assistance.

DOE O 5530.4, *Aerial Measuring System*

Establishes requirements to maintain a capability to provide regularly scheduled aerial remote sensing surveys to provide baseline radiological, multi-spectral, and other remotely sensed data; early warning of environmental impacts of operations; and total site surveillance. In addition, capability will be maintained to provide urgent and emergency aerial assessment of radiological conditions in the vicinity of peacetime radiological incidents or accidents.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE O 5530.5 Chg 1, *Federal Radiological Monitoring and Assessment Center*

Establish Department of Energy (DOE) policy, procedures, authorities, and requirements for the establishment of a Federal Radiological Monitoring and Assessment Center (FRMAC), as set forth in the Federal Radiological Emergency Response Plan (FRERP).

Series 5600—Defense Programs

DOE O 5660.1B, *Management of Nuclear Materials*

Establishes requirements and procedures for the management of nuclear materials within the DOE in order to implement a comprehensive nuclear materials management program to conserve valuable nuclear material resources; distribute nuclear materials needed for DOE and other programs for research, development, and other purposes; optimize nuclear materials production, processing, and inventory management operations; and conduct studies and prepare plans for the future use and disposition of nuclear materials including operation of DOE nuclear materials production, processing, and storage facilities.

Related Documents Setting Forth Safety-related Requirements

SEN-35-91, *Nuclear Safety Policy*

Establish the basic nuclear safety policy from which specific safety rules, orders, standards, and other requirements shall follow.

DOE M 140.1-1B, *Interface with the Defense Nuclear Facilities Safety Board*

Presents the process the Department of Energy (Department) will use to interface with the Defense Nuclear Facilities Safety Board (Board) and its staff. The requirements and guidance in this Manual apply to Departmental personnel, including employees of the National Nuclear Security Administration (NNSA), who are to use this Manual to facilitate the quality and responsiveness of the Departmental interactions with the Board and its staff.

DOE P 141.2, *Public Participation and Community Relations*

Ensure that public participation and community outreach are integral and effective parts of DOE activities and that decisions are made with the benefit of significant public perspectives.

DOE G 151.1-1 series, *Emergency Management Guide Volumes 1 through 7*

Provides non-mandatory guidance for the implementation of the requirements pertaining to the DOE comprehensive Emergency Management System (EMS). The Emergency Management Guide (EMG) is applicable to all DOE facilities/sites, activities, and operations and to all DOE organizational levels (facility/site, Operations/Field Office, and Headquarters offices). Emphasis is placed on guidance for the Operational Emergency Programs at facilities/sites.

DOE N 153.2, *Connectivity to National Atmospheric Release Advisory Center (NARAC)*

Establish requirements for connectivity with the National Atmospheric Release Advisory Center (NARAC) at Lawrence Livermore National Laboratory for all DOE and NNSA sites and facilities with potential for hazardous materials releases at levels that require emergency response.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE G 200.1-1 series, *Software Engineering Methodology Guide Chapters 1 through 10*

Provides guidance for software engineering, project management, and quality assurance practices and procedures. The primary purpose of the methodology is to promote the development of reliable, cost-effective, computer-based software products while making efficient use of resources. Use of the methodology will also aid in the status tracking, management control, and documentation efforts of the project.

DOE G 225.1A-1, *Implementation Guide for Use with DOE Order 225.1 Accident Investigations*

Provide guidance regarding acceptable methods for implementing the requirements addressed in DOE O 225.1A. The approach to investigations described in the Guide is similar to and consistent with methods used by other government agencies and private industry. It provides an organized and proven methodology for effectively and efficiently conducting Type A and Type B accident investigations.

DOE P 226.1, *Department of Energy Oversight Policy*

Establishes the expectations for effective oversight of performance in security, cyber security, emergency management, environment, safety and health, and business operations.

DOE M 231.1-1A Chg 1, *Environment, Safety and Health Reporting Manual*

Supplements DOE O 231.1A and provides detailed requirements for implementing Department of Energy reporting requirements, including time schedules for reporting and data elements to be reported. The Page Change clarifies responsibilities pertaining to occupational injury and illness recordkeeping and recording; requires quarterly reconciliation of occupational injury and illness data; and provides clarification on data elements that must be reported and reconciled with local data records.

DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide*

Supplements DOE M231.1-2, *Occurrence Reporting and Processing of Operations Information*, by meeting identified needs for added occurrence reporting guidance, clarification, or interpretations.

DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*

Provides detailed information for reporting occurrences and managing associated activities at DOE facilities, including NNSA facilities.

DOE G 231.1-2, *Occurrence Reporting Causal Analysis Guide*

Intends to assist personnel in determining the Apparent Cause(s) of specific reportable occurrences and to explain the structure and nodes of the Causal Analysis Tree for use in occurrence reporting and causal analysis.

DOE P 251.1, *Directives System Policy*

Directives provide formal and organized communication of the Department's expectations for performance of work within the DOE complex and include Policy Statements, Regulations, Orders, Notices, Manuals, Guides, and Technical Standards.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE M 251.1-1B, *Directives System Manual*

Define requirements and responsibilities for implementing the Department of Energy (DOE) Directives Program in support of DOE P 251.1A, *Departmental Directives Program Policy*, and DOE O 251.1B, *Departmental Directives Program*.

DOE G 252.1-1, *Technical Standards Program Guide*

Describes Technical Standards Program (TSP) management systems and procedures that help the Department of Energy (DOE) comply with Federal law and Federal and DOE policy, which are implemented through requirements in DOE O 252.1, *Technical Standards Program*. It also outlines how TSP day-to-day activities involving technical standards are conducted in support of DOE.

DOE G 341.1-1, *Guide on Federal Employee Occupational Medical Programs*

Supplements the requirements and responsibilities specified in DOE O 341.1, *Federal Employee Health Services,* and provides preferred implementing methods and procedures.

DOE G 341.1-2, *Guide on Federal Employee Assistance Programs*

Supplements the requirements and responsibilities specified in DOE O 341.1**,** *Federal Employee Health Services*, and applies only to Federal employees.

DOE M 360.1-1B, *Federal Employee Training Manual*

Provides detailed requirements to supplement DOE O 360.1B, *Federal Employee Training*. The information in this Manual is intended to assist in improving Federal workforce performance under Department of Energy (DOE) managed Federal employee training.

DOE P 410.1A, *Promulgating Nuclear Safety Requirements*

Establishes policy for use of notice and comment rulemaking to promulgate requirements on nuclear safety issues currently covered by DOE Orders, and issuance of notices of proposed rulemaking with respect to important nuclear safety requirements in existing DOE Orders as expeditiously as practicable. The use of notice and comment rulemaking gives members of the public the opportunity for meaningful participation in the development of nuclear safety requirements.

DOE P 411.1, *Safety Management Functions, Responsibilities, and Authorities*

Defines the DOE safety management functions, responsibilities, and authorities to ensure that work is performed safely and efficiently. Develops and implements requirements and standards that are necessary to provide reasonable assurance that workers, the public, and the environment are adequately protected; and defines essential safety management functions and establish unambiguous DOE roles, responsibilities, and authorities for executing them to accomplish the authorized work.

DOE M 411.1-1C, *Safety Management Functions, Responsibilities, and Authorities Manual*

Defines safety management functions, responsibilities, and authorities for DOE senior management with responsibilities for line, support, oversight, and enforcement actions.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE P 413.1, *Program and Project Management Policy for the Planning, Programming, Budgeting, and Acquisition of Capital Assets*

Establish Department of Energy program and project management policy for the planning, programming, budgeting, and acquisition of capital assets consistent with the following Office of Management and Budget (OMB).

DOE M 413.3-1, *Project Management for the Acquisition of Capital Assets*

Provide requirements and guidance to Department of Energy (DOE) employees, including National Nuclear Security Administration (NNSA) employees on the planning and acquisition of capital assets.

DOE G 414.1-1A, *Management Assessment and Independent Assessment Guide*

Gives information on establishing processes and performing effective assessments in support of DOE O 414.1A, *Quality Assurance*; DOE P 450.4, *Safety Management System Policy*; DOE P 450.5, *Line ES&H Oversight Policy*; and 10 CFR Part 830 Subpart A.

DOE G 414.1-2A, *Quality Assurance Management System Guide for Use with 10 CFR 830.120 and DOE Order 414.1*

Provides information on principles and practices used to establish and implement an effective quality assurance program or quality management system in accordance with the requirements of 10 CFR 830.

DOE G 414.1-3, *Suspect/Counterfeit Items Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE O 414.1B, Quality Assurance*

Provides guidance to assist DOE/NNSA and its contractors in mitigating the safety threat of suspect/counterfeit items (S/CIs).

DOE G 414.1-4, *Safety Software Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE O 414.1C, Quality Assurance*

Provides information plus acceptable methods for implementing the safety software quality assurance (SQA) requirements of DOE O 414.1C, *Quality Assurance*.

DOE G 414.1-5, *Corrective Action Program Guidance*

Developed to assist the Department of Energy (DOE) organizations and contractors in the development, implementation, and followup of corrective action programs utilizing the feedback and improvement core safety function within DOE's Integrated Safety Management System. This Guide outlines some of the basic principles, concepts, and lessons learned that DOE managers and contractors might consider when implementing corrective action programs based on their specific needs.

DOE G 420.1-1, *Nonreactor Nuclear Safety Design Criteria and Explosive Safety Criteria Guide for Use with DOE Order 420.1 Facility Safety*

Provides guidance on the application of requirements for nonreactor nuclear facilities and explosives facilities of DOE O 420.1, *Facility Safety, Section 4.1, Nuclear and Explosives Safety Design Criteria*.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE G 420.1-2*, Guide for Mitigation of Natural Phenomena Hazards for DOE Nuclear Facility and Non-Nuclear Facilities*

Provides guidance in implementing the Natural Phenomena Hazard (NPH) mitigation requirements of DOE O 420.1, *Facility Safety*, *Section 4.4, Natural Phenomena Hazards Mitigation*. This Guide does not establish or invoke any new requirements. Any apparent conflicts arising from the NPH guidance would defer to the requirements in DOE O 420.1.

DOE G 421.1-1 series, *Criticality Safety Good Practices Program Guide for DOE Nonreactor Nuclear Facilities*

Establishes DOE nuclear criticality safety interpretation and guidance to assist in implementation of nuclear criticality safety (NCS) across the DOE complex and provides examples for the development of nuclear criticality safety procedures and manuals for DOE contractors.

DOE G 421.1-2*, Implementation Guide for Use in Developing Documented Safety Analyses to Meet Subpart B of 10 CFR 830*

Elaborates on the documented safety analysis (DSA) development process and the safe harbor provisions of the Appendix to 10 CFR 830 Subpart B. Title 10 Code of Federal Regulations (CFR) Part 830, Subpart B, *Safety Basis Requirements*, requires the contractor responsible for a Department of Energy (DOE) nuclear facility to analyze the facility, the work to be performed, and the associated hazards and to identify the conditions, safe boundaries, and hazard controls necessary to protect workers, the public, and the environment from adverse consequences.

DOE G 423.1-1, *Implementation Guide for Use in Developing Technical Safety Requirements*

Provides elaboration for the content of Technical Safety Requirements (TSRs). Section 10 CFR 830.205 of the Nuclear Safety Management rule, requires Department of Energy (DOE) contractors responsible for category 1, 2, and 3 DOE nuclear facilities to develop TSRs. These TSRs identify the limitations to each DOE owned, contractor operated nuclear facility based on the documented safety analysis (DSA) and any additional safety requirements established for the facility.

DOE G 424.1-1A*, Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements*

Provides information to assist in implementation of Title 10 Code of Federal Regulations (CFR) Part 830.203, *Unreviewed Safety Question Process*, of the Nuclear Safety Management Rules for Category 1, 2, and 3 nuclear facilities owned or operated by the Department of Energy, including the National Nuclear Security Administration.

DOE P 426.1, *Federal Technical Capability for Defense Nuclear Facilities*

The FTCP provides for the recruitment, deployment, development, and retention of Federal personnel with the demonstrated technical capability to safely accomplish the Department's missions and responsibilities. It is institutionalized through DOE directives to establish the program's objective, guiding principles, and functions. The program is specifically applicable to those offices and organizations performing functions related to the safe operation of defense nuclear facilities.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE M 426.1-1A, *Federal Technical Capability Manual*

Provides requirements and responsibilities to ensure recruitment and hiring of technically capable personnel to retain critical technical capabilities within the Department at all times.

DOE P 430.1, *Land and Facility Use Planning*

Strengthens the stewardship of our vast lands and facilities and encourages the return of some of these national resources to their rightful owners, the American public. The policy will stimulate local economies, cut costs, and ensure public participation in our planning processes.

DOE G 430.1-2, *Implementation Guide for Surveillance and Maintenance During Facility Transition Disposition*

Provide guidance on surveillance and maintenance (S&M) activities conducted as part of facility transition and disposition activities, for Department of Energy (DOE) facilities that have been declared or are forecast to be excess to any current or future mission requirements.

DOE G 430.1-3, *Deactivation Implementation Guide*

Prepared to aid in the development, planning, and implementation of deactivation requirements and activities at Department of Energy (DOE) facilities that have been declared excess to any future mission requirements. It is one of four Guides developed to provide guidance for facility transition and disposition activities.

DOE G 430.1-4, *Decommissioning Implementation Guide*

Prepared to aid in the planning and implementation of decommissioning activities at Department of Energy (DOE) facilities that have been declared excess to any future mission requirements. It is one of four that have been developed to provide guidance for facility transition and disposition activities.

DOE G 430.1-5, *Transition Implementation Guide*

Prepared to aid in the development, planning, and implementation of requirements and activities during the transition phase at Department of Energy (DOE) facilities that have been declared or are forecast to become excess to any future mission requirements.

DOE G 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE Order 433.1*

Describes a maintenance management program that would be acceptable to DOE for meeting the requirements of DOE O 433.1, *Maintenance Management Program for DOE Nuclear Facilities*.

DOE M 435.1-1 Chg 1, *Radioactive Waste Management Manual*

Describes the requirements and establishes specific responsibilities for implementing DOE O 435.1, Radioactive Waste Management, for the management of DOE high-level waste, transuranic waste, low-level waste, and the radioactive component of mixed waste. Change 1 dated 6/19/01 removes the requirement that Headquarters is to be notified and the Office of Environment, Safety and Health consulted for exemptions for use of non-DOE treatment facilities.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE G 435.1-1 series, *Implementation Guide for Use with DOE Manual 435.1-1 Chapters 1 through 4*
Developed to aid in implementing the requirements of DOE M 435.1-1, *Radioactive Waste Management Manual*.

DOE M 440.1-1A, *DOE Explosives Safety Manual*
Prescribes the Department of Energy (DOE) safety standards and procedures used to implement the DOE safety policy contained in DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees* for operations involving the development, testing, handling, and processing of explosives or assemblies containing explosives.

DOE G 440.1-8, *Implementation Guide for Use with 10 CFR Part 851, Worker Safety and Health Programs*
Provides supplemental information and describes implementation practices to assist contractors in effectively developing, managing, and implementing worker safety and health programs required by 10 Code of Federal Regulations, Part 851, *Worker Safety and Health Program*.

DOE G 440.1-x series, *Guides for Use with DOE Order 440.1 Volume 1-5, 7A*
Intends to identify acceptable methods for implementing the provisions of DOE O 440.1, *Worker Protection Management for DOE Federal and Contractor Employees*.

DOE P 441.1, *DOE Radiological Health and Safety Policy*
Establishes the Department of Energy's Radiological Health and Safety Policy as a basis for the Department's radiological control programs.

DOE G 441.1-x series, *Guides for Use with 10 CFR 835 Volumes 1 through 13*
Provide an acceptable methodology for establishing and operating the Programs that will comply with U.S. Department of Energy (DOE) requirements specified in Title 10 of the Code of Federal Regulations (CFR), Part 835, Occupational Radiation Protection (DOE 1998a), hereinafter referred to as 10 CFR 835.

DOE G 442.1-1, *DOE Employee Concerns Program Guide*
Ensures DOE employees and any contractor or subcontractor fulfilling DOE's mission have the right and responsibility to report concerns relating to the environment, safety, health, or management of Department operations.

DOE P 442.1, *Differing Professional Opinions on Technical Issues*
Establishes a differing professional opinion (DPO) policy to facilitate dialogue and resolution on DPOs related to environment, safety, and health of DOE facilities and activities.

DOE M 442.1-1, *Differing Professional Opinions Manual for Technical*
Establishes a differing professional opinion (DPO) policy to a Department of Energy (DOE) Differing Professional Opinion (DPO) Process to encourage and facilitate dialogue and resolution on DPOs from employees for technical issues involving environment, safety, and health.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE G 450.1-x series, *Implementation Guide for Use with DOE Order 450.1 Volumes 1A, 2, and 4*
Provides background information, an overview of the integration process and guidance in order to meet the requirements of DOE O 450.1, *Environmental Protection Program*.

DOE P 450.2A, *Identifying, Implementing, and Complying with ES&H Requirements*
Sets forth the framework for identifying, implementing and complying with environment, safety and health (ES&H) requirements so that work is performed in the DOE complex in a manner that ensures adequate protection of workers, the public and the environment.

DOE P 450.3, *Authorizing Use of the Necessary and Sufficient Process for Standards-Based Environment, Safety and Health Management*
Provides requirements and guidance for near term use of the Necessary and Sufficient Process. The Necessary and Sufficient Process should be applied where substantial benefit—in terms of worker and public safety, environmental protection, mission accomplishment, and cost—can be realized.

DOE M 450.3-1, *DOE Closure Process for Necessary and Sufficient Sets of Standards*
Establishes the expectations of how DOE personnel, contractors, and other interested parties should interact in defining standards necessary for performing work, integrating those standards into the process for planning and accomplishing work, evaluating the efficacy of the standards in light of current missions, and continuously assessing the effectiveness of the standards in providing adequate protection to the worker, the public, and the environment.

DOE G 450.3-1, *Documentation for Work Smart Standards Applications: Characteristics and Considerations*
Provides guidance on the Characteristics and Considerations for a Documentation of the set of Work Smart Standards (WSS) and the Closure Process to successful development of a standards-based system for doing work.

DOE G 450.3-2, *Attributes of Effective Implementation*
Establishes a framework to guide Implementation of sets of standards approved using the WSS Closure Process and establishes a framework to promote improved implementation for those activities that are already in the implementation phase, irrespective of the means by which standards were identified and approved.

DOE G 450.3-3, *Tailoring for Integrated Safety Management Applications*
Illustrate how tailoring work management functions facilitate the safe and effective accomplishment of work (including design), and to demonstrate that tailoring is integral to the ISM system.

DOE P 450.4, *Safety Management System Policy*
Provides a formal, organized process whereby people plan, perform, assess, and improve the safe conduct of work.

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE M 450.4-1, *Integrated Safety Management System Manual*
Provides requirements and guidance for DOE and contractors to ensure development and implementation of an effective ISM system that is periodically reviewed and continuously improved.

DOE G 450.4-1B series, *Integrated Safety Management System Guide Volumes 1 through 2*
Assists Department of Energy (DOE) contractors in developing, describing, and implementing an Integrated Safety Management System (ISMS) and Assists DOE line managers and contracting officers who provide ISMS guidance and requirements, review and approve ISMS products, verify implementation of the ISMS, and perform various integrating activities that complement for the ISMS.

DOE P 450.7, *Environment, Safety and Health (ES&H) Goals*
Establishes Environment, Safety and Health (ES&H) goals for Department of Energy (DOE) personnel and its contractors. These goals are designed to establish Departmental ES&H expectations for: 1) DOE and contractor personnel ES&H behaviors and attitudes in the conduct of their daily work activities, and 2) operational performance regarding worker injuries and illnesses, regulatory enforcement actions, and environmental releases.

DOE M 452.2-1, *Nuclear Explosive Safety*
Provides supplemental details to support the requirements of DOE O 452.2C, *Nuclear Explosive Safety*.

DOE P 454.1, *Use of Institutional Controls*
Delineates how the Department of Energy (DOE), including the National Nuclear Security Administration, will use institutional controls in the management of resources, facilities and properties under its control and to implement its programmatic responsibilities. The Policy will guide site-specific and programmatic decisions on DOE's own planning, maintenance and implementation of institutional controls, and address responsibilities related to DOE's role as a steward of Federal lands and properties, and identify activities that DOE needs to accomplish.

DOE G 454.1-1, *Institutional Controls Implementation Guide for Use with DOE P 454.1, Use of Institutional Controls*
Provides information to assist Department of Energy program and field offices in understanding what is necessary and acceptable for implementing the provisions of DOE P 454.1, *Use of Institutional Controls*.

DOE P 455.1, *Use of Risk-Based End States*
Focuses the Department line management officials on conducting cleanup that is aimed at, and achieves, clearly defined, risk-based end states. Risk-based end states are representations of site conditions and associated information that reflect the planned future use of the property and are appropriately protective of human health and the environment consistent with that use.

DOE G 460.1-1 series, *Implementation Guide for Use with DOE Order 460.1A, Packaging and Transportation Safety*
Assists in the development of implementation plans to effectively carry out the requirements and responsibilities of the DOE Order 460.1A, *Packaging and Transportation Safety.*

Table A.3 – Descriptions of Department Orders and Safety Directives Designated by the Board as "of Interest," Continued

DOE G 460.2-1, *Implementation Guide for Use with DOE Order 460.2 Departmental Materials Transportation and Packaging Management*

Assists those responsible for transporting and packaging Department materials, and to provide an understanding of Department policies on activities which supplement regulatory requirements.

DOE M 460.2-1, *Radioactive Material Transportation Practices Manual*

Establishes standard transportation practices for Departmental programs to use in planning and executing offsite shipments of radioactive materials including radioactive waste. This directive is to be used with DOE O 460.2, *Departmental Materials Transportation and Packaging Management*.

DOE M 461.1-1 Chg 1, *Packaging and Transfer of Materials of National Security Interest Manual*

Establishes requirements for operational safety controls for onsite operations and provides Department of Energy (DOE) technical safety requirements and policy objectives for development of an Onsite Packaging and Transfer Program, pursuant to DOE O 461.1A, *Packaging and Transfer or Transportation of Materials of National Security Interest*.

DOE M 470.4-6 Chg 1, *Nuclear Material Control and Accountability*

Establishes a program for the control and accountability of nuclear materials within the Department of Energy, including the National Nuclear Security Administration (NNSA).

10 CFR Part 820, *Procedural Rules for DOE Nuclear Activities*

Sets forth the procedures to govern the conduct of persons involved in DOE nuclear activities and, in particularly, to achieve compliance with the DOE Nuclear Safety Requirements by all persons subject to those requirements.

10 CFR Part 830, Nuclear Safety Management, Subpart A, *Quality Assurance Requirements*

Sets forth rules for contractors responsible for a DOE nuclear facility to conduct work in accordance with the QA criteria; develop and submit for approval by DOE a QA program for the work; and implement the QA program, as approved and modified by DOE.

10 CFR Part 830, Nuclear Safety Management, Subpart B, *Nuclear Safety Management*

Sets forth rules describing how responsible contractors must prepare a documented safety analysis that in part, describes the facility, activities, and operations; provides systematic identification of hazards; evaluates normal, abnormal, and accident conditions; and derives hazard controls to provide an adequate level of safety to the public, workers and the environment.

10 CFR Part 835, *Occupational Radiation Protection*

The rules in this part establish radiation protection standards, limits, and program requirements for protecting individuals from ionizing radiation resulting from the conduct of DOE activities.

10 CFR Part 851, *Worker Safety and Health Program*

Establishing the framework for a worker protection program that will reduce or prevent occupational injuries, illnesses, and accidental losses by requiring DOE contractors to provide their employees' with safe and healthful workplaces; and procedures for investigating whether a requirement has been violated, for determining the nature of such violations, and for imposing appropriate remedy.

APPENDIX B

Site Visits Supported by the Department in 2006

Albuquerque

- On February 13-17, 2006, the Board's staff traveled to the DOE National Training Center in **Albuquerque, NM** to monitor the Senior Technical Security Manager Pilot Course and attend the DOE Energy Facility Contractors Group Authorization Basis workshop.

- On February 27 – March 3, 2006, the Board's staff traveled to **Albuquerque, NM** to attend the DOE 2006 Research and Development Electrical Safety Workshop and the Survey of Nuclear Weapons Technology training course, and observe the transuranic waste safety conference.

- On March 27-29, 2006, the Board's staff traveled to **Albuquerque, NM** to attend an electrostatic discharge meeting.

- On April 24-28, 2006, the Board's staff traveled to **Albuquerque, NM** to attend the Integrated Safety Management Champions and the Energy Facility Contractors Group meeting.

- On May 8-12, 2006, the Board's staff traveled to **Albuquerque, NM** for a survey of Weapons Development and Technology (WR 708) at the Sandia National Laboratory.

Atlanta

- On March 27-29, 2006, the Board's staff traveled to **Atlanta, GA** to attend the DOE/Savannah River Site Tank Cleaning workshop.

Augusta

- On April 24-28, 2006, the Board's staff traveled to **Augusta, GA** to attend the annual DOE Fire Safety and Emergency Response workshop.

Aurora

- On September 11-15, 2006, the Board's staff traveled to **Aurora, CO** to attend the Integrated Safety Management workshop.

Carlsbad

- On January 9-13, 2006, the Board's staff traveled to **Carlsbad, NM** to observe the semi-annual DOE Transuranic Waste Corporate Board meeting.

- On July 24-27, 2006, the Board's staff traveled to **Carlsbad, NM** to conduct a remote-handled transuranic Radcon/Radiological Engineering Review at the Waste Isolation Pilot Plant.

- On October 2-5, 2006, the Board's staff traveled to **Carlsbad, NM** to conduct a Waste Isolation Pilot Plant Transuranic Waste review.

- On December 4-8, 2006, the Board's staff traveled to **Carlsbad, NM** to observe the DOE remote-handled transuranic waste operational readiness review at the Waste Isolation Pilot Plant.

Columbia

- On March 1-2, 2006, the Board's staff traveled to **Columbia, SC** to support the Chairman in his meeting with the South Carolina Governor's Advisory Board.

- On April 24-25, 2006, the Board's staff traveled to **Columbia, SC** to discuss the results of the Salt Waste Processing Facility structural and geotechnical analysis for safety class facility structures.

Hanford

- On January 16-20, 2006, the Board's staff traveled to **Hanford** to review solid waste stabilization and dispositioning, Plutonium Finishing Plant decontamination and dispositioning, and the application of DOE Order 413.3 and DOE Order 431.1A for multiple projects.

- On February 13-17, 2006, the Board's staff traveled to **Hanford** to review the K-Basin Closure sludge project and the interim secure storage facility.

- On February 20-24, 2006, the Board's staff traveled to **Hanford** to review the Tank Farm work planning.

- On April 3-7, 2006, the Board's staff traveled to **Hanford** to review the hydrogen in pipes and ancillary vessel issues at the Waste Treatment Plant.

- On May 1-5, 2006, the Board's staff traveled to **Hanford** to support the Board's site visit.

- On June 12-15, 2006, the Board's staff traveled to **Hanford** to review the Waste Treatment Plant Hydrogen in Pipes and Ancillary Vessels.

- On July 10-13, 2006, the Board's staff traveled to **Hanford** to observe in the Tank Farms Expert Panel Vapor Space Corrosion workshop.

- On August 14-18, 2006, the Board's staff traveled to **Hanford** to review the K-Basin sludge transfer contractor Operational Readiness Review.

- On September 15-21, 2006, the Board's staff traveled to **Hanford** to review the Waste Treatment Plant Hydrogen in Pipes and Ancillary Vessels projects.

- On September 18-21, 2006, the Board's staff traveled to **Hanford** to review the Waste Treatment Plant Hydrogen in Pipes and Ancillary Vessels projects.

- On September 25-29, 2006, the Board's staff traveled to **Hanford** to review the Department's Operational Readiness Review for the K-Basin sludge transfer.

- On October 2-6, 2006, the Board's staff traveled to **Hanford** to review the Department's Operational Readiness Review for the K-Basin sludge transfer.

- On October 17-20, 2006, the Board's staff traveled to **Hanford** to conduct a Demonstration Bulk Vitrification System design update review.

- On November 13-17, 2006, the Board's staff traveled to **Hanford** to review the Washington Closure Hanford work planning activities.

- On December 4-7, 2006, the Board's staff traveled to **Hanford** to support the one Board member's site visit.

- On December 11-15, 2006, the Board's staff traveled to **Hanford** to review decontamination and decommissioning programs.

Idaho

- On June 5-9, 2006, the Board's staff traveled to **Idaho** to review the safety basis for the TRU waste retrieval operations at the Accelerated Retrieval Project and the Advanced Mixed Waste Treatment Project.

- On March 27-31, 2006, the Board's staff traveled to **Idaho** to review the Decontamination and Decommissioning and Integrated Safety Management programs.

- On May 1-5, 2006, the Board's staff traveled to **Idaho** to review the Integrated Waste Treatment Unit project.

- On July 25-28, 2006, the Board's staff traveled to **Idaho** to support the Board's site visit.

- On October 23-27, 2006, the Board's staff traveled to **Idaho** to review the storage and disposition of spent nuclear fuel.

Knoxville

- On May 15-18, 2006, the Board's staff traveled to **Knoxville, TN** to attend the DOE Facility Representatives workshop and the annual Federal Technical Capability Panel meeting.

Las Vegas

- On December 12-15, 2006, the Board's staff traveled to **Las Vegas, NV** to review the NNSA Quality Assurance Road Map.

Lawrence Livermore National Laboratory

- On January 2-6, 2006, the Board's staff traveled to the **Lawrence Livermore National Laboratory** to attend the W87 Nuclear Explosive Safety Study training.

- On February 20-24, 2006, the Board's staff traveled to the **Lawrence Livermore National Laboratory** to review B332 Documented Safety Analyses.

- On April 18-20, 2006, the Board's staff traveled to **Lawrence Livermore National Laboratory** to observe in the NNSA Quality Assurance meeting.

- On April 24-28, 2006, the Board's staff traveled to the **Lawrence Livermore National Laboratory** to observe the bi-annual enhanced surveillance campaign review.

- On July 17-21, 2006, the Board's staff traveled to the **Lawrence Livermore National Laboratory** to conduct a site-wide fire protection program review.

- On July 24-28, 2006, the Board's staff traveled to the **Lawrence Livermore National Laboratory** to conduct a Criticality Safety Program review.

- On August 14-18, 2006, the Board's staff traveled to the **Lawrence Livermore National Laboratory** to observe the Object -77 Readiness Assessment.

- On August 29-31, 2006, the Board's staff traveled to the **Lawrence Livermore National Laboratory** to review technical safety for multi-unit operations at Pantex.

- On September 11-15, 2006, the Board's staff traveled to the **Lawrence Livermore National Laboratory** to observe the Object-77 Readiness Assessment.

Los Alamos National Laboratory

- On February 27-March 2, 2006, the Board's staff traveled to the **Los Alamos National Laboratory** to review Los Alamos National Laboratory's transition and the Los Alamos Site Office oversight.

- On March 20-24, 2006, the Board staff traveled to the **Los Alamos National Laboratory** and the **Sandia National Laboratory** to support the Board in its Public Meeting and site visits.

- On April 11-13, 2006, the Board's staff traveled to the **Los Alamos National Laboratory** to review the plant control system of the 90% final design.

- On April 24-28, 2006, the Board's staff traveled to the **Los Alamos National Laboratory** to review the Chemistry and Metallurgy Research Replacement Building and to observe and review the Disposition Drill at the **Sandia National Laboratory**.

- On June 5-9, 2006, the Board's staff traveled to the **Los Alamos National Laboratory** to conduct a Chemistry and Metallurgy Research Replacement Design review.

- On June 12-16, 2006, the Board's staff traveled to the **Los Alamos National Laboratory** to review the geotechnical probabilistic seismic hazard analysis.

- On July 31-August 3, 2006, the Board's staff traveled to the **Los Alamos National Laboratory** to review Nuclear Criticality Safety Corrective Actions.

- On August 7-11, 2006, the Board's staff traveled to the **Los Alamos National Laboratory** to review W88 significant finding investigations and the Plutonium Facility.

- On August 21-23, 2006, the Board's staff traveled to **Los Alamos National Laboratory** to review waste generation and disposition activities.

- On September 11-15, 2006, the Board's staff traveled to the **Los Alamos National Laboratory** to review the electrical and fire protection systems and attend the W88 Nuclear Explosive Safety Study orientation.

- On October 2-6, 2006, the Board's staff traveled to the **Los Alamos National Laboratory** to conduct an Energetic Materials review.

- On November 6-9, 2006, the Board's staff traveled to **Los Alamos National Laboratory** to review, Federal oversight, the Contractor Assurance Plan, institutional safety program improvements, plutonium operations, authorization bases, and significant projects.

- On November 20-22, 2006, the Board's staff traveled to the **Los Alamos National Laboratory** to participate in the Chemistry and Metallurgy Research Replacement design meeting.

- On November 27-December 1, 2006, the Board's staff traveled to the **Los Alamos National Laboratory** to support the Board's site visit.

- On December 18-20, 2006, the Board's staff traveled to the **Los Alamos National Laboratory** to attend a meeting with the Los Alamos Site Office, the Probabilistic Seismic Hazard Analysis Steering Committee, and URS Corporation to review and discuss the Los Alamos National Laboratory Probabilistic Seismic Hazard Analysis.

Nevada

- On January 9-13, 2006, the Board's staff traveled to Las Vegas to review the preliminary documented safety analysis for the Critical Experiment Facility at the **Nevada Test Site** Device Assembly Facility.

- On January 9-13, 2006, the Board's staff traveled to the **Nevada Test Site** to review fire protection at the Nevada Test Site and the ventilation systems in the Critical Experiment Facility and Device Assembly Facility.

- On March 14-17, 2006, the Board's staff traveled to the **Nevada Test Site** for a structural review of the Device Assembly Facility.

- On March 27-30, 2006, the Board's staff traveled to the **Nevada Test Site** to attend the Criticality Safety Support Group and the DOE Nuclear Criticality Safety Program meetings.

- On March 27-31, 2006, the Board's staff traveled to the **Nevada Site Office** to attend the Office of Environment, Safety, and Health's Safety in Design workshop.

- On May 8-12, 2006, the Board's staff traveled to the **Nevada Test Site** to observe and review the Criticality Experiment Facility 90% Final Design.

- On May 30-June 2, 2006, the Board's staff traveled to the **Nevada Test Site** to observe and review the 90% final design for the Device Assembly Facility Criticality Experiments Facility.

- On June 19-23, 2006, the Board's staff traveled to the **Nevada Test Site** to conduct a safety basis review of the Criticality Experiments Facility Preliminary Documented Safety Analysis and observe the disposition exercise.

- On June 26-30, 2006, the Board's staff traveled to the **Nevada Test Site** to review the readiness assessment for the Unicorn experiment.

- On July 10-14, 2006, the Board's staff traveled to the **Nevada Test Site** to review the readiness assessment for the Unicorn experiment.

- On August 14-18, 2006, the Board's staff traveled to the **Nevada Test Site** to review operations for the Unicorn experiment.

- On August 24-25, 2006, the Board's staff traveled to the **Nevada Test Site** to observe the stemming operations for the Unicorn experiment.

- On August 28-31, 2006, the Board's staff traveled to the **Nevada Test Site** to review readiness to execute the Unicorn experiment.

- On October 10-13, 2006, the Board's staff traveled to the **Nevada Test Site** to support the Board's site visit.

- On December 11-15, 2006, the Board's staff traveled to the **Nevada Test Site** to review the Device Assembly Facility Safety Management program reviews and activities.

Oak Ridge

- On February 22-24, 2006, the Board's staff traveled to the **Oak Ridge National Laboratory/Oak Ridge** to review transuranic waste activities and Tank W1A.

- On April 10-13, 2006, the Board's staff traveled to **Oak Ridge** to review quality control and construction of the Highly Enriched Uranium Materials Facility.

- On May 15-19, 2006, the Board's staff traveled to **Oak Ridge** to attend the Nondestructive Assays Holdup Measurements workshop.

- On June 21-23, 2006, the Board's staff traveled to **Oak Ridge** to review Bldg. 3019, Tank W1A, and transuranic waste processing.

- On December 4-7, 2006, the Board's staff traveled to **Oak Ridge** to review Building 3019 and U-233 blendown.

River Protection

- On January 17-20, 2006, the Board's staff traveled to the **Office of River Protection** to observe the external review of the Waste Treatment Plant flowsheet.

- On February 20-24, 2006, the Board's staff traveled to the **Office of River Protection** to review work planning and control for Office of River Protection defense nuclear facilities projects managed by CH2M Hill Hanford Group, Inc.

Pantex

- On January 9-13, 2006, the Board's staff traveled to **Pantex** for the W87 Nuclear Explosive Safety Study kick-off meeting.

- On February 6-10, 2006, the Board's staff traveled to **Pantex** to observe the B61 Nuclear Explosive Safety Study Orientation meeting.

- On February 13-17, 2006, the Board's staff traveled to **Pantex** to review the W87 Nuclear Explosive Safety Study Oversight.

- On February 20-24, 2006, the Board's staff traveled to **Pantex** to observe the W87 Nuclear Explosive Safety Study.

- On March 13-17, 2006, the Board's staff traveled to **Pantex** to observe the B61 Nuclear Explosive Safety Study meetings and demonstrations.

- On March 20-24, 2006, the Board's staff traveled to **Pantex** to observe the B61 Nuclear Explosive Safety Study meetings and demonstrations.

- On March 27-31, 2006, the Board's staff traveled to **Pantex** to review the W87 Nuclear Explosive Safety Study; Hoisting, Rigging and Tooling activities; the W87 Hazard Analysis Report and; the W76 Nuclear Explosive Safety Change Evaluation.
- On April 24-27, 2006, the Board's staff traveled to **Pantex** to participate in the review of the bases for Multi-Unit operations.
- On June 5-9, 2006, the Board's staff traveled to **Pantex** to support the Board's visit and to review the Authorization Basis change packages.
- On June 19-23, 2006, the Board's staff traveled to **Pantex** to review the W84 Nuclear Explosive Safety Study.
- On July 17-21, 2006, the Board's staff traveled to **Pantex** to conduct a site-wide seismic review.
- On October 2-5, 2006, the Board's staff traveled to **Pantex** to conduct a Specific Administrative Controls review.
- On October 9-13, 2006, the Board's staff traveled to **Pantex** to observe the B83 Nuclear Explosive Safety Change Evaluation Process and the Nuclear Explosive Safety Study of the W88 Cell Operations Restart project.
- On October 16-20, 2006, the Board's staff traveled to **Pantex** to review the Nuclear Explosive Safety Study for the restart of W88 cell operations.
- On October 23-27, 2006, the Board's staff traveled to **Pantex** to observe the W88 Cell Operations Restart Project Readiness Assessment and to review the B83 SS-21 Readiness Assessment.
- On November 6-9, 2006, the Board's staff traveled to **Pantex** to review the B83 SS-21 Readiness Assessment.
- On November 13-17, 2006, the Board's staff traveled to **Pantex** to observe the W88 Cell Operations Restart Project Readiness Assessment.
- On December 4-8, 2006, the Board's staff traveled to **Pantex** to attend the Human Reliability Program training and observe the restart of W88 cell operations.

Pittsburgh

- On April 18-20, 2006, the Board's staff traveled to **Pittsburgh, PA** to observe the seismic qualification testing for the Waste Treatment Plant – safe change HEPA filter housings.

Salt Lake City

- On December 11-15, 2006, the Board's staff traveled to **Salt Lake City, UT** to participate in the team meeting for the development of DOE-STD-1189, *Integrating Safety into Design*.

Sandia

- On January 23-27, 2006, the Board's staff traveled to **Sandia/Albuquerque** to attend the Nuclear Explosive Safety Study B61 training and the B53 status update meeting , to review the Documented Safety Analyses, Integrated Safety Management, Software Quality Assurance, and to conduct walkdown of the reactors.

- On February 13-17, 2006, the Board's staff traveled to **Sandia** to review the Occurrence Reporting and Processing System regarding the recent Radiological Controlled Area contamination event, and corrective actions.

- On February 27-March 3, 2006, the Board's staff traveled to **Sandia** to attend the W88 Weapon Hazard Training and attend the proposed weapon dismantlement meeting.

- On April 17-20, 2006, the Board's staff traveled to the **Sandia National Laboratory** to attend the B-53 program review and the SS-21 kickoff meetings.

- On May 8-12, 2006, the Board's staff traveled to the **Sandia National Laboratory** to review weapons multi-unit operations.

- On June 5-9, 2006, the Board's staff traveled to the **Sandia National Laboratory** to attend a NNSA meeting to review the proposed weapon dismantlement.

- On June 12-14, 2006, the Board's staff traveled to the **Sandia National Laboratory** to attend a NNSA meeting and to review proposed weapon dismantlement.

- On October 2-6, 2006, the Board's staff traveled to the **Sandia National Laboratory** to review corrective actions for Integrated Safety Management and authorization bases.

Savannah River Site

- On January 18-20, 2006, the Board's staff traveled to the **Savannah River Site** to review the corrective actions to resolve previously identified issues at Concentration, Storage, and Transfer Facilities and Tritium Effects Laboratory.

- On February 6-9, 2006, the Board's staff traveled to the **Savannah River Site** to review the Nuclear Criticality and High-Level Waste programs and to attend the design review for the Salt Waste Processing Facility.

- On February 22-24, 2006, the Board's staff traveled to the **Savannah River Site** to review the High-Level Waste program.

- On February 27-March 2, 2006, the Board's staff traveled to the **Savannah River Site** to collect information regarding the High-Level Waste Salt Processing Options and High Level Waste Tank Corrosion.

- On March 9-10, 2006, the Board staff traveled to the **Savannah River Site** to review the High-Level Waste program.

- On March 13-17, 2006, the Board's staff traveled to the **Savannah River Site** to review the Fire Protection program and the ventilation system for the Salt Waste Processing Facility.

- On April 10-14, 2006, the Board's staff traveled to the **Savannah River Site** to review the Tritium Extraction Facility.

- On April 18-20, 2006, the Board's staff traveled to the **Savannah River Site** to attend the Plutonium Disposition workshop.

- On April 24-27, 2006, the Board's staff traveled to the **Savannah River Site** to observe the Savannah River National Laboratory's transuranic Waste Repackaging Readiness Assessment.

- On May 10-12, 2006, the Board's staff traveled to the **Savannah River Site** to attend the kickoff meeting for the Tank 48 disposition and liquid waste review.

- On May 15-18, 2006, the Board's staff traveled to the **Savannah River Site** to review High-Level Waste issues.

- On May 29-June 2, 2006, the Board's staff traveled to the **Savannah River Site** to review the Glass Waste Storage Building #2 DOE Operational Readiness Review.

- On June 5-6, 2006, the Board's staff traveled to the **Savannah River Site** to review the Glass Waste Storage Building #2 DOE Operational Readiness Review.

- On June 13-15, 2006, the Board's staff traveled to the **Savannah River Site** to review the electrical, instrumentation and control systems for the Salt Waste Processing Facility.

- On June 20-23, 2006, the Board's staff traveled to the **Savannah River Site** to support the Board's site visit.

- On August 28-September 1, 2006, the Board's staff traveled to the **Savannah River Site** to conduct a High-Level Waste Document Preparation Profile Review, to observe the Contractor Operational Readiness Review for the Tritium Extraction Facility, and to review process chemistry at the Salt Waste Processing Facility.

- On September 4-8, 2006, the Board's staff traveled to the **Savannah River Site** to observe the Contractor Operational Readiness Review for the Tritium Extraction Facility.

- On September 18-20, 2006, the Board's staff traveled to **Columbia, SC** and to the **Savannah River Site** to participate in Salt Waste Processing Facility Independent Review Team meetings.

- On December 11-14, 2006, the Board's staff traveled to **Savannah River Site** to support two Board members' site visit and attend the Independent Review Team Meeting for the Salt Waste Processing Facility.

- On October 16-18, 2006, the Board's staff traveled to the **Savannah River Site** to review the structural and geotechnical analysis of the Salt Waste Processing Facility safety class facility structures.

- On October 23-27, 2006, the Board's staff traveled to the **Savannah River Site** to review the Department's Operational Readiness Review for the Tritium Extraction Facility.

- On November 6-9, 2006, the Board's staff traveled to the **Savannah River Site** for a Nuclear Criticality Safety Review.

- On November 13-15, 2006, the Board's staff traveled to the **Savannah River Site** to review the organization, design, and safety strategy of the Container Surveillance and Storage Capability Project.

Waste Isolation Pilot Plant

- On May 15-18, 2006, the Board's staff traveled to the **Waste Isolation Pilot Plant** to review contact-handled transuranic operations, and the plans for the remote-handled transuranic waste.

Y-12

- On January 11-12, 2006, the Board's staff traveled to **Y-12** to review the in-process nuclear materials.
- On February 20-21, 2006, the Board's staff traveled to **Y-12** to review the Highly Enriched Uranium Materials Facility.
- On March 13-15, 2006, the Board's staff traveled to **Y-12** to review the Uranium Processing Facility.
- On March 28-31, 2006, the Board's staff traveled to **Y-12** to support the Board's site visit.
- On June 12-15, 2006, the Board's staff traveled to **Y-12** to review quality assurance and the Highly Enriched Uranium Materials Facility.
- On November 13-15, 2006, the Board's staff traveled to **Y-12** to support two Board members on their site visit.
- On November 21-22, 2006, the Board's staff traveled to **Y-12** to participate in the Uranium Processing Facility discussion.

APPENDIX C

Key Correspondence Between the Department and the Board in 2006

From the Board

January

- On **January 5, 2006**, the Board sent a letter to the Department establishing a 90-day reporting requirement regarding sludge stabilization and packaging system for K-Basins at the Hanford Site.

- On **January 17, 2006**, the Board sent a letter to the Department establishing a reporting requirement for the Office of Environmental Management to provide a path forward to address the issues in the review of work planning for Tank W-1A soil characterization and sampling at the Oak Ridge National Laboratory.

- On **January 20, 2006**, the Board sent a letter to the Department forwarding Technical Report 36, *Integrated Safety Management: The Foundation for an Effective Safety Culture*.

February

- On February 8, 2006, the Board sent an announcement of a public meeting regarding NNSA's plans and actions to follow through with improvements in safety management identified prior to, during the suspension, and resumption of operations at the Department's defense nuclear facilities located at Los Alamos National Laboratory scheduled on March 22, 2006, at the Duane W. Smith Auditorium in Los Alamos, NM.

- On **February 28, 2006**, the Board sent a letter to the Department regarding the documented safety analysis for the 9212 Complex located at the Y-12 National Security Complex.

March

- On **March 1, 2006**, the Board sent a letter to the Department thanking and congratulating William J. Brumley, Manager of NNSA's Y-12 Site Office, for his significant contributions to our country on the occasion of his retirement.

- On **March 3, 2006**, the Board sent a letter to the Department establishing a 90-day reporting requirement regarding plans for implementing DOE Policy 226.1, *Department of Energy Oversight Policy*, and DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*, at DOE Headquarters and sites and the oversight programs of the Savannah River Operations Office.

- On **March 15, 2006**, the Board sent a letter to the Department forwarding its Sixteenth Annual Report to Congress describing the Board's health and safety activities relating to the Department of Energy's defense nuclear facilities in 2005.

- On **March 27, 2006**, the Board sent a letter to the Department regarding conduct of operations at the Pantex Plant.

- On **March 27, 2006**, the Board sent a letter to the Department establishing a 60-day reporting requirement regarding issues at the Critical Experiment Facility at the Nevada Test Site.

- On **March 27, 2006**, the Board sent a letter to the Department establishing a 60-day reporting requirement regarding validating certain aspects of DOE's vital safety system activities prior to closing Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems*.

April

- On **April 24, 2006**, the Board sent a letter to the Department regarding the Board's review of implementation of activity-level work and control by Fluor Hanford, Inc. at the Hanford Site.

- On **April 24, 2006**, the Board sent a letter to the Department establishing a 30-day reporting requirement to address comments regarding the Department's draft repackaging prioritization methodology relative to the Department's implementation plan for Board Recommendation 2005-1, *Nuclear Material Packaging*.

May

- On **May 1, 2006**, the Board sent a letter to the Department establishing a 30-day reporting requirement for DOE to provide a response to comments raised by the Board's staff review of draft DOE Manual 441.1, *Nuclear Material Packaging Manual*.

- On **May 10, 2006**, the Board sent a letter to the Department regarding authorization basis documentation for the Plutonium Facility located at the Lawrence Livermore National Laboratory.

June

- On **June 7, 2006**, the Board sent an announcement of a Public Meeting on the incorporation of safety into the design and construction of new and existing Department of Energy defense nuclear facilities scheduled on July 19, 2006 at the Defense Nuclear Facilities Safety Board Headquarters in Washington, D.C.

- On **June 13, 2006**, the Board sent a letter to the Department congratulating Robert "Dary" Newbry of the Idaho Operations Office as the Department of Energy Facility Representative of the Year for 2005.

- On **June 19, 2006**, the Board sent a letter to the Department establishing a 60-day reporting requirement for NNSA to describe its plans for staging, assessing, and the disposition of a damaged nuclear weapons or improvised nuclear devices at the G-Tunnel located at the Nevada Test Site.

- On **June 26, 2006**, the Board sent a letter to the Department regarding the realignment of the Department's Office of Environment, Safety and Health into a newly created entity.

- On **June 26, 2006**, the Board sent a letter to the Department establishing a 120-day reporting requirement regarding issues associated with the implementation of DOE Standard 1027, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports, Change Notice 1* (Standard 1027).

- On **June 28, 2006**, the Board sent a letter to the Department establishing a 90-day reporting requirement regarding the Department's Nuclear Criticality Safety Program.

July

- On **July 12, 2006**, the Board sent a letter to the Department forwarding the Third Annual Report to Congress on Plutonium Storage at the Savannah River Site.

August

- On **August 9, 2006**, the Board sent a letter to the Department regarding the proposed restart of W88 cell operations at the Pantex Plant.

- On **August 15, 2006,** the Board sent a letter to the Department requesting that a revision to implementation plan 2004-2, *Active Confinement Systems,* be submitted within 30 days.

- On **August 15, 2006**, the Board sent a letter to the Department establishing a 30-day reporting requirement regarding the Department's plans for implementing the safety requirements in DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*, at DOE sites that contain defense nuclear facilities.

- On **August 16, 2006**, the Board sent a letter to the Department requesting a response within 60 days regarding existing structural cracks at the Device Assembly Facility located at the Nevada Test Site.

- On **August 16, 2006**, the Board sent a letter to the Department requesting a briefing within 30 days regarding DOE-NA-STD-3016-2006, *Preparation Guide for U.S. Department of Energy Nuclear Explosive Operation Hazard Analysis Reports.*

- On **August 21, 2006**, the Board sent a letter to the Department providing observations from the Board's July 19, 2006, public meeting and review of the Department's actions taken to improve the integration of safety into design of new defense nuclear facilities.

September

- On **September 7, 2006**, the Board sent a letter to the Department regarding ground motion criteria and structural engineering issues at the Hanford Waste Treatment and Immobilization Plant.

- On **September 13, 2006**, the Board sent a letter to the Department thanking Amy Poston for her dedicated service as the Department's liaison to the Board at the Savannah River Site.

- On **September 15, 2006**, the Board sent an announcement of the assignment of Mr. Brett Broderick as a Site Representative at the Department's Los Alamos National Laboratory.

- On **September 22, 2006**, the Board sent a letter to the Department establishing a reporting requirement on how safety-related issues at the Critical Experiment Facility project are being addressed.

- On **September 22, 2006**, the Board sent a letter to the Department establishing a 45-day reporting requirement regarding the implementation plans for the Nuclear Criticality Safety Program at the Los Alamos National Laboratory.

- On **September 26, 2006**, the Board sent a letter to the Department regarding surface settlement profiles for the Pit Disassembly and Conversion Facility located at the Savannah River Site.

October

- On **October 11, 2006**, the Board sent a letter to the Department regarding the review of the Nuclear Criticality Safety Program implementation at the Lawrence Livermore National Laboratory.

- On **October 17, 2006**, the Board staff sent a letter to the Department forwarding an updated list of Orders of Interest to the Board.

November

- On **November 21, 2006**, the Board sent a letter to the Department providing feedback on the Department's 2004-1 implementation plan revision, dated October 12, 2006, and the closing of Board Recommendation 95-2, *Safety Management*.

December

- On **December 15, 2006**, the Board sent a letter to the Department requesting NNSA to provide a completion date for the final assessment report, DOE Commitment 4.5.1 in the 98-2 implementation plan, *Safety Management at Pantex.*

- On **December 15, 2006**, the Board sent a letter to the Department thanking Michael Reaka for his six years of dedicated service as the Department's liaison to the Board at the Pantex Site Office.

From the Department

January

- On **January 6, 2006**, the Acting Deputy Assistant Secretary for the Office of Corporate Performance Assessment sent a letter to the Board providing the status of directives related to software quality assurance.

- On **January 6, 2006**, the Acting Deputy Assistant Secretary for the Office of Corporate Performance Assessment sent a letter to the Board regarding four DOE technical standards for High Efficiency Particulate Air filters.

- On **January 12, 2006**, the Administrator for the National Nuclear Security Administration sent a letter to the Board regarding fire protection at the Los Alamos National Laboratory.

- On **January 17, 2006**, the Secretary sent a letter to the Board forwarding Revision 3 of the 2001-1 implementation plan, *High-Level Waste Management at the Savannah River Site*.

- On **January 23, 2006**, the Assistant Secretary for the Office of Environment, Safety and Health sent a letter to the Board forwarding the revised draft of the Department's Risk Assessment Policy.

- On **January 26, 2006**, the Responsible Manager for the 2005-1 implementation plan sent a letter to the Board regarding the Department's resolution of the DOE document type that will be used for the new packaging and storage criteria relative to the 2005-1 implementation plan, *Nuclear Material Packaging.*

- On **January 26, 2006**, the Secretary sent a letter to the Board regarding the path forward for guidance to evaluate and document weapon responses relative to Commitment 4.2.2 in Revision 1 in the 98-2 implementation plan, *Safety Management at Pantex.*

- On **January 27, 2006**, the Director for the Office of Nuclear and Facility Safety Policy a letter to the Board forwarding the report on the Implementation of Specific Administrative Controls under Board Recommendation 2002-3, *Design, Implementation, and Maintenance of Administrative Controls.*

- On **January 30, 2006**, the Responsible Manager for the 2005-1 implementation plan sent a letter to the Board forwarding the draft repackaging prioritization methodology for review in accordance with the 2005-1 implementation plan, *Nuclear Material Packaging.*

- On **January 30, 2006**, the Assistant Secretary for the Office of Environment, Safety and Health sent a letter to the Board providing a status report on the development and issuance of a DOE operating experience order.

- On **January 31, 2006**, the Central Technical Authority for the National Nuclear Security Administration sent a letter to the Board reporting completion of NNSA's part in Commitment 2 in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations.*

February

- On **February 2, 2006**, the Director for the Office of Nuclear and Facility Safety sent a letter to the Board forwarding the ventilation system evaluation guidance for safety-related and non-safety-related systems, which are deliverables for Commitments 8.5.4 and 8.7 in the 2004-2 implementation plan, *Active Confinement System*.

- On **February 3, 2006**, the Deputy Assistant Secretary for the Office of Corporate Performance Assessment sent a letter to the Board reporting the interim status of Commitment 7B in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **February 7, 2006**, the Manager for the Office of River Protection sent a letter to the Board commending David Grover, Board Site Representative, for his contributions to Office of River Protection.

- On **February 8, 2006**, the Assistant Deputy Administrator for Research, Development, and Simulation for Defense Programs sent a letter to the Board forwarding the Nuclear Criticality Safety Program for Calendar Year 2005.

- On **February 10, 2006**, the Assistant Deputy Administrator for Program Integration for Defense Programs sent a letter to the Board providing an update on NNSA's path forward and schedule for achieving full implementation of the site office quality assurance programs of Commitment 10A in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **February 13, 2006**, the Administrator for the National Nuclear Security Administration sent a letter to the Board providing status on NNSA policy letters.

- On **February 14, 2006**, the Assistant Deputy Administrator for Program Integration for Defense Programs sent a letter to the Board providing status of Commitment 4.3.3 in the 2002-1 implementation plan, *Quality Assurance for Safety-Related Software*.

- On **February 28, 2006**, the Administrator for the National Nuclear Security Administration sent a letter to the Board reporting the completion of NNSA's portion of Commitment 23 in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

March

- On **March 1, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board reporting completion of Environmental Management's portion of Commitment 9, Deliverable B, in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **March 3, 2006**, the Under Secretary of Energy sent a letter to the Board reporting completion of Environmental Management's portion of Commitments 23 and 25 in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **March 7, 2006**, the Director for the Office of Nuclear and Facility Safety Policy sent a letter to the Board providing the NNSA and Environmental Management listing of hazard category 3 for defense nuclear facilities with an active confinement ventilation system relative to Commitment 8.4 in the 2004-2 implementation plan, *Active Confinement System*.

- On **March 13, 2006**, the Principal Deputy Administrator for the National Nuclear Security Administration sent a letter to the Board forwarding NNSA's approach and schedule for completing actions that are necessary to complete Commitment 9B in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **March 13, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board regarding the Device Assembly Facility.

- On **March 14, 2006**, the Deputy Administrator for Defense Programs for the National Nuclear Security Administration sent a letter to the Board reporting completion of NNSA's portion of Commitment 25 in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **March 16, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board forwarding the complete data packages for all NNSA sites relative to Commitment 4.6.2 in the 2002-3 implementation plan, *Design, Implementation, and Maintenance of Administrative Controls*.

- On **March 16, 2006**, the Departmental Representative to the Defense Nuclear Facilities Safety Board sent a letter to the Board forwarding its Annual Report to Congress for Calendar Year 2005, on its activities relating to the Defense Nuclear Facilities Safety Board.

- On **March 20, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board providing interim status on the partial site-wide fire alarm replacement and the waste management risk mitigation projects located at the Los Alamos National Laboratory.

- On **March 23, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board regarding the sodium bearing waste treatment project.

- On **March 27, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board reporting completion of NNSA commitment to establish dispositions of former Albuquerque and other operations offices' supplemental directives.

- On **March 29, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board reporting completion of Environmental Management's portion of Commitment 10B in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **March 29, 2006**, the Director for the Office of Nuclear and Facility Safety Policy sent a letter to the Board forwarding Change Notice No. 3 to DOE-STD-3009, Preparation Guide for U.S. Department of Energy nonreactor nuclear facility documented safety analyses, completing Deliverable 4.2.2 and Commitment 4.2 in the 2002-3 implementation plan, *Design, Implementation, and Maintenance of Administrative Controls*.

- On **March 30, 2006**, the Responsible Manager for the 2005-1 implementation plan sent a letter to the Board forwarding the draft DOE Manual 441.1, *Nuclear Material Packaging Manual*, for review and comment.

- On **March 30, 2006**, the Acting Assistant Secretary for the Office of Environment, Safety and Health sent a letter to the Board providing the deliverable for the issuance of a repacking risk methodology in Commitment 5.3-2 in the 2005-1 implementation plan, *Nuclear Material Packaging*.

April

- On **April 4, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board reporting completion of Commitments 3.8 and 3.9 in the 2001-1 implementation plan, *High-Level Waste Management at the Savannah River Site*.

- On **April 10, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board forwarding the approved Los Alamos Site Office functions, responsibilities, and authorities manual.

- On **April 26, 2006**, the Administrator for the National Nuclear Security Administration sent a letter to the Board regarding the Device Assembly Facility safety basis implementation plan.

May

- On **May 5, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board regarding the Uranium Processing Facility and the facility risk review for continued safe operation of the 9212 Complex at Y-12.

- On **May 9, 2006**, the Acting Assistant Secretary for the Office of Environment, Safety and Health sent a letter to the Board providing an update on the Energy, Science and Environment portion of Commitment 2 in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **May 9, 2006**, the Under Secretary of Energy sent a letter to the Board providing an update on the Energy, Science and Environment portion of Commitment 2 in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **May 15, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board regarding the Los Alamos National Laboratory fire protection program.

- On **May 18, 2006**, the Acting Assistant Secretary for the Office Environment, Safety and Health sent a letter to the Board regarding the *Methodology for Determining Repackaging Needs and Prioritization of Repacking Nuclear Materials*.

- On **May 25, 2006**, the Senior Advisor for Environment, Safety and Health for the National Nuclear Security Administration sent a letter to the Board regarding the Department of Energy's Standard, DOE-STD-3016, *Preparation Guide for U.S. Department of Energy Nuclear Explosive Operation Hazard Analysis Report*.

- On **May 26, 2006**, the Secretary sent a letter to the Board reporting completion of all commitments in the implementation plan for Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems* and requesting closure of Board Recommendation 2000-2.

June

- On **June 2, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board regarding the review of the Critical Experiment Facility project design.

- On **June 8, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board providing an update on the Oak Ridge Office Quality Assurance Program Plan.

- On **June 8, 2006**, the Acting Assistant Secretary for the Office of Environment, Safety and Health sent a letter to the Board regarding DOE Manual 441.1-1, *Nuclear Material Packaging Manual*.

- On **June 14, 2006**, the Assistant Secretary for the Office of Environmental Management sent a letter to the Board regarding activity-level work planning and control implementation issues by Fluor Hanford, Inc. at Richland.

- On **June 28, 2006**, the Secretary sent a letter to the Board regarding implementation of DOE Order and Policy 226.1, *Implementation of Department of Energy Oversight Policy*.

- On **June 28, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board regarding the status of the flood mitigation measures and the flood retention structure at TA-18.

- On **June 28, 2006**, the Manager for the Office of River Protection sent a letter to the Board providing the status and path forward of the seismic ground motion issue at the Waste Treatment and Immobilization Plant.

July

- On **July 11, 2006**, the Acting Assistant Deputy Administrator for Military Applications and Stockpile Operations for Defense Programs sent a letter to the Board regarding status of the nuclear explosive safety directives.

- On **July 11, 2006**, the Secretary sent a letter to the Board forwarding the Department's revised implementation plan for Board Recommendation 2001-1, *High-Level Waste Management at the Savannah River Site*.

- On **July 12, 2006**, the Secretary sent a letter to the Board forwarding the Department's revised 2004-2 implementation plan for Board Recommendation 2004-2, *Active Confinement System*.

- On **July 13, 2006**, the Acting Assistant Secretary for the Office of Environment, Safety and Health sent a letter to the Board forwarding DOE Order 210.2, *DOE Corporate Operating Experience Program*, completing Commitment 18 in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **July 14, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board forwarding the Office of Environmental Management facility ventilation system evaluations priority listing, completing Deliverable 8.6.1 in the 2004-2 implementation plan, Revision 1, *Active Confinement System*.

- On **July 18, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board regarding lightning protection and detection issues at the Nevada Test Site.

- On **July 21, 2006**, the Acting Assistant Secretary for the Office of Environment, Safety and Health sent a letter to the Board regarding comments on the draft repackaging prioritization methodology relative to the 2005-1 implementation plan, *Nuclear Material Packaging*.

- On **July 24, 2006**, the Secretary sent a letter to the Board providing the status and path forward for the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **July 25, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board forwarding information regarding its review of DOE Orders of Interest to the Board and supplemental directives.

- On **July 27, 2006**, the Acting Assistant Secretary for the Office of Environment, Safety and Health sent a letter to the Board providing status on the Department's draft manual DOE Manual 441.1-1, *Nuclear Material Packaging Manual*.

August

- On **August 1, 2006**, the Director for the Office of Nuclear and Facility Safety Policy sent a letter to the Board providing information on the establishment of an independent review panel under Commitment 8.6.2 in the 2004-2 implementation plan, *Active Confinement System*.

- On **August 7, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board forwarding the NNSA list of facilities that will complete a Safety Related Ventilation System Evaluation, completing Deliverable 8.6.1 in the 2004-2 implementation plan, *Active Confinement System*.

- On **August 11, 2006**, the Secretary sent a letter to the Board forwarding the Department's Third Report to Congress on Actions Taken by the Department of Energy in response to the proposals in the Defense Nuclear Facilities Safety Board's December 2003 Report to Congress on Plutonium storage at the Savannah River Site.

- On **August 15, 2006**, the Acting Assistant Secretary for the Office of Environment, Safety and Health sent a letter to the Board regarding the revision of DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*, and DOE Order 414.1C, *Quality Assurance*.

September

- On **September 8, 2006**, the Chief Health, Safety and Security Officer sent a letter to the Board regarding a schedule for revising DOE Order 470.2B, *Independent Oversight and Performance Assurance Program*.

- On **September 19, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board regarding structural cracks at the Device Assembly Facility at the Nevada Test Site.

- On **September 19, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board reporting completion of NNSA's portion of Commitment 10B in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **September 27, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board transmitting two Environmental Management pilot facility evaluations for Commitment 8.6.3 in the 2004-2 implementation plan, *Active Confinement System*.

- On **September 28, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board providing an update on Quality Assurance Programs in the Environmental Management field offices relative to the requirements in DOE Order 414.1C, *Quality Assurance*.

October

- On **October 2, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board notifying the Board of a potential to miss the commitment date in Commitment 119E in the 2000-1 implementation plan, *Stabilization and Storage of Nuclear Material*.

- On **October 3, 2006**, the Departmental Representative to the Defense Nuclear Facilities Safety Board sent a letter to the Board transmitting the technical professional career development program description, a deliverable which completes Commitment 12 in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **October 5, 2006**, the Chief Health, Safety and Security Officer sent a letter to the Board regarding interfacing with the Defense Nuclear Facilities Safety Board and the review of draft DOE Manual 140.1-1C, *Interface with the Defense Nuclear Facilities Safety Board*.

- On **October 12, 2006**, the Secretary sent a letter to the Board forwarding the revised implementation plan for Board Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*.

- On **October 13, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board reporting completion of Commitment 220 in the 2000-1 implementation plan, *Stabilization and Storage of Nuclear Material*.

- On **October 20, 2006**, the Deputy Secretary sent a letter to the Board regarding the Nuclear Criticality Safety program.

- On **October 25, 2006**, the Chief Health, Safety and Security Officer sent a letter to the Board regarding DOE Standard 1027, Change Notice 1, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*.

- On **October 26, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board reporting completion of Commitment 119E in the 2000-1 implementation plan, *Stabilization and Storage of Nuclear Material*.

- On **October 30, 2006**, the Under Secretary of Energy sent a letter to the Board reporting completion of Commitment 2 in the 2004-1 implementation plan, Revision 2, *Oversight of Complex, High-Hazard Nuclear Operations*.

November

- On **November 1, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board regarding NNSA standards and other documents that may need revision in conjunction with the updated NNSA functions, responsibilities and authorities manual.

- On **November 2, 2006**, the Administrator for the National Nuclear Security Administration sent a letter to the Board regarding implementation concerns on the Nuclear Criticality Safety Program at the Los Alamos National Laboratory.

- On **November 3, 2006**, the Administrator for the National Nuclear Security Administration sent a letter to the Board regarding NNSA's directives system.

- On **November 3, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board reporting completion of Commitment 4.3.3 in the 2002-1 implementation plan, *Quality Assurance for Safety-Related Software*.

- On **November 7, 2006**, the Departmental Representative to the Defense Nuclear Facilities Safety Board sent a letter to the Board reporting completion of Commitment 22B in the 2004-1 implementation plan, *Oversight of Complex, High-Hazard Nuclear Operations* with the issuance of DOE Manual 450-4.1, *Integrated Safety Management System Manual*.

- On **November 21, 2006**, the Secretary sent a letter to the Board regarding DOE's points of contact for the preparation of the joint report on the development of design standards for DOE nuclear facilities.

- On **November 22, 2006**, the Secretary sent a letter to the Board forwarding the changes in schedules for deliverables to resolve comments and complete development of the proposed nuclear materials packaging manual.

- On **November 22, 2006**, the Secretary sent a letter to the Board regarding the Board's feedback on the revision to the 2004-2 implementation plan, *Active Confinement System*.

- On **November 29, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board informing the Board that they have implemented the Environmental Management Quality Assurance Program plan.

December

- On **December 4, 2006**, the Chief Operating Officer for Environmental Management sent a letter to the Board forwarding the program evaluation for integration of liquid waste processing facilities, a deliverable in Commitment 3.11 in the 2001-1 implementation plan, Revision 4, *High-Level Waste Management at the Savannah River Site*.

- On **December 7, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board forwarding NNSA's response to safety-related design issues raised in Board letter dated September 22, 2006 regarding the Critical Experiment Facility project preliminary documented safety analysis.

- On **December 19, 2006**, the Deputy Administrator for Defense Programs sent a letter to the Board informing the Board that the Pit Disassembly and Conversion Facility has been identified as NNSA's pilot facility in the safety related ventilation system evaluation process relative to Commitment 8.6 in the 2004-2 implementation plan, *Active Confinement System*.

- On **December 21, 2006**, the Director for the Office of Health and Safety sent a letter to Dr. Joseph Bader, Board Member, thanking him for agreeing to speak at the upcoming Chemical Safety Topical Committee's Ninth Annual Joint Energy Facility Contractors Group Chemical Management Workshop scheduled for March 13-15, 2007.

APPENDIX D

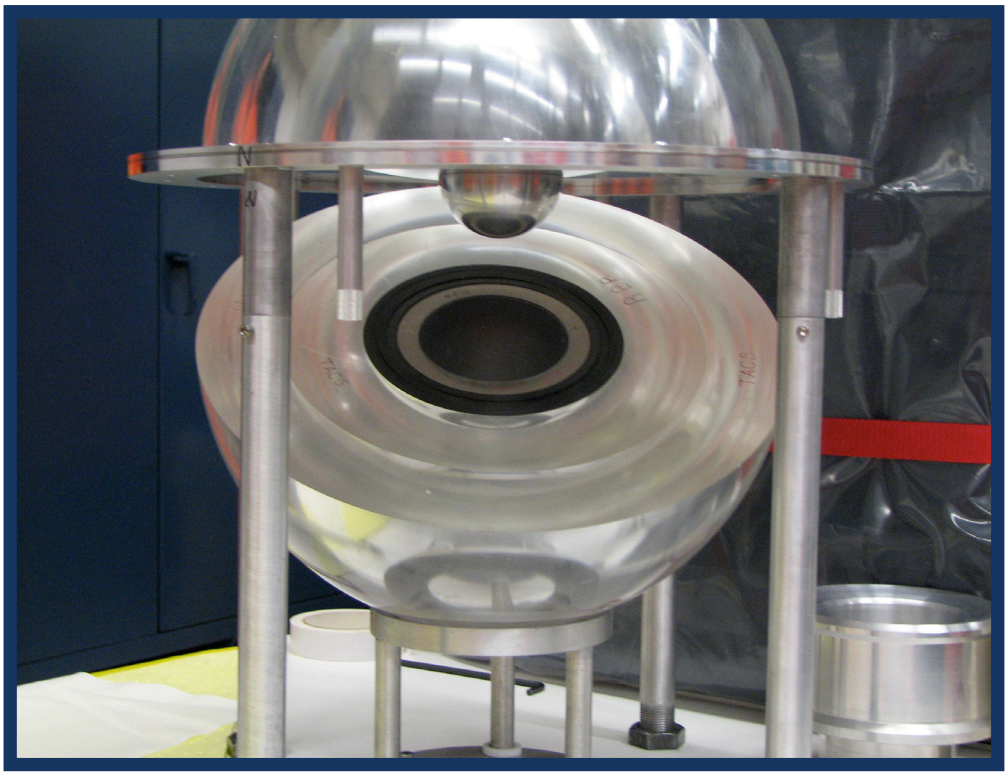
Abbreviations and Acronyms

2000-1	Board Recommendation 2000-1, *Stabilization and Storage of Nuclear Material*
2000-2	Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems*
2001-1	Board Recommendation 2001-1, *High-Level Waste Management at the Savannah River Site*
2002-1	Board Recommendation 2002-1, *Quality Assurance for Safety-Related Software*
2002-2	Board Recommendation 2002-2, *Weapons Laboratory Support of the Defense Nuclear Complex*
2002-3	Board Recommendation 2002-3, *Design, Implementation, and Maintenance of Administrative Controls*
2004-1	Board Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*
2004-2	Board Recommendation 2004-2, *Active Confinement System*
2005-1	Board Recommendation 2005-1, *Nuclear Material Packaging*
92-4	Board Recommendation 92-4, *Multi-Function Waste Tank Facility at Hanford Tank Farms*
94-1	Board Recommendation 94-1, *Improved Schedule for Remediation*
95-2	Board Recommendation 95-2, *Safety Management*
97-1	Board Recommendation 97-1, *Safe Storage of Uranium-233*
98-1	Board Recommendation 98-1, *Resolution of Safety Issues Identified by Internal Independent Oversight*
98-2	Board Recommendation 98-2, *Safety Management at Pantex*
99-1	Board Recommendation 99-1, *Safe Storage of Pits at Pantex*

Board	Defense Nuclear Facilities Safety Board
BWXT	BWX Technologies, Inc.
CAMP	Corrective Action Management Program
CBFO	Carlsbad Field Office
CD	Critical Decision
CDNS	Chief of Defense Nuclear Safety
CEMP	Columbus Environmental Management Project
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CH	Contact Handled
CNS	Chief of Nuclear Safety
CTA	Central Technical Authority
CY	Calendar Year
D&D	Decontamination and Decommissioning
DAF	Device Assembly Facility
DBVS	Demonstration Bulk Vitrification System
DEAR	Department of Energy Acquisition Regulation
Department	Department of Energy
Departmental Representative	Departmental Representative to the Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DOE G	DOE Guide
DOE M	DOE Manual
DOE O	DOE Order
DOE P	DOE Policy
DOT	Department of Transportation
DPO	Differing Professional Opinion
DWPF	Defense Waste Processing Facility
DSA	Documented Safety Analysis
DST	Double Shell Tank
EFCOG	Energy Facility Contractors Group
EM	Office of Environmental Management
EMS	Environmental Management System
EPA	Environmental Protection Agency
ES&H	Environment, Safety and Health
ETTP	East Tennessee Technology Park
FEMP	Fernald Environmental Management Project
FLP	Future Leaders Program
FTCP	Federal Technical Capability Program

FY	Fiscal Year
HEPA	High Efficiency Particulate Air
HEU	Highly Enriched Uranium
HLW	High Level Waste
HPM	High Pressure Mixer
HVAC	Heating, Ventilation, and Air Conditioning
ID	Idaho Operations Office
INEL	Idaho National Engineering Laboratory
INL	Idaho National Laboratory
INPO	Institute of Nuclear Power Operations
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
LANL	Los Alamos National Laboratory
LASO	Los Alamos Site Office
LAW	Low Activity Waste
LEU	Low Enriched Uranium
LLNL	Lawrence Livermore National Laboratory
LLW	Low Level Waste
LSO	Livermore Site Office
NARAC	National Atmospheric Release Advisory Center
NE	Office of Nuclear Energy
NEPA	National Environmental Policy Act
NES	Nuclear Explosive Safety
NNSA	National Nuclear Security Administration
NSC	National Security Complex
NSO	Nevada Site Office
NTS	Nevada Test Site
OCF	Oxide Conversion Facility
OR	Oak Ridge Operations Office
ORNL	Oak Ridge National Laboratory
ORP	Office of River Protection
ORR	Operational Readiness Review
PPPO	Portsmouth/Paducah Project Office
PFP	Plutonium Finishing Plant
PJM	Pulse Jet Mixer
QA	Quality Assurance
QAP	Quality Assurance Program
RFETS	Rocky Flats Environmental Technology Site
RH	Remote Handled

RL	Richland Operations Office
RWMC	Radioactive Waste Management Complex
Sandia	Sandia National Laboratories
Secretary	Secretary of Energy
SIMS	Safety Issues Management System
SME	Subject Matter Expert
SNF	Spent Nuclear Fuel
SNM	Special Nuclear Material
SQA	Software Quality Assurance
SR	Savannah River Operations Office
SRNL	Savannah River National Laboratory
SRS	Savannah River Site
SRSO	Savannah River Site Office
SS-21	Seamless Safety for the 21st Century
SSO	Sandia Site Office
SST	Single Shell Tank
STD	Standard
SWPF	Salt Waste Processing Facility
TA	Los Alamos National Laboratory Technical Area
TEF	Tritium Extraction Facility
TQP	Technical Qualification Program
TRU	Transuranic
TSR	Technical Safety Requirement
TVA	Tennessee Valley Authority
UPF	Uranium Processing Facility
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USQ	Unreviewed Safety Question
VSS	Vital Safety System
WIPP	Waste Isolation Pilot Plant
WSS	Work Smart Standards
WTP	Waste Treatment and Immobilization Plant
YSO	Y-12 Site Office



Cover Photograph:

The Training Assembly for Criticality Safety (TACS) at Lawrence Livermore National Laboratory consists of nesting uranium (both depleted uranium and highly enriched uranium) shells with various reflectors and moderators. Pictured on the cover are plastic reflectors surrounding the dark gray uranium while a plastic moderating shell sits in the innermost position. TACS is used for DOE Nuclear Criticality Safety Program (NCSP) sponsored criticality safety training in which students stack the assembly into various subcritical arrangements.

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