
Fiscal Year 2001 Performance Report

**Submitted Under Provisions of the
Government Performance and Results Act**

Defense Nuclear Facilities Safety Board



March 2002

INTRODUCTION

The Defense Nuclear Facilities Safety Board (Board) is an independent federal agency established by Congress in 1989. Broadly speaking, the Board's mandate under the Atomic Energy Act is to provide safety oversight of the nuclear weapons complex operated by the Department of Energy (DOE). The nation's nuclear weapons program continues to be a complex and hazardous activity, under which DOE must maintain readiness of the nuclear arsenal, dismantle surplus weapons, dispose of excess radioactive materials, and clean up surplus facilities. These operations not only involve existing facilities, but also require new facilities of sophisticated design and function. All of these activities must be carried out in a manner that protects the public, workers, and the environment.

The Board uses its Strategic Plan and Annual Performance Plan to ensure that its limited resources remain focused on the most significant safety challenges, keeping pace with shifts in those challenges from year to year. All of the Board's safety activities are closely tied to goals and objectives embodied in these plans. This approach gives the Board confidence that its small staff (fewer than 100, including Board Members) and budget (less than \$20 million per year) are dedicated to the highest-risk activities under the Board's jurisdiction. The Board's Strategic Plan may be viewed in its entirety on the Board's internet website: *www.dnfsb.gov*.

The information in this Government Performance and Results Act (GPRA) report is also provided directly to Congress in the Board's statutorily required Annual Report, also available on the Board's website. There are slight differences between the two reports because the Annual Report covers calendar year (CY) 2001 rather than fiscal year (FY) 2001.

Overall Outcome: The Board met its performance goals for FY 2001. In a few cases noted in the report, the safety improvements sought by the Board have not yet been fully achieved by DOE. The Board is vigorously pursuing those goals in FY 2002.

GOAL 1. COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Integrated Safety Management (ISM) (including comprehensive health and safety requirements, technically competent personnel, and effective implementing mechanisms) continues to evolve through feedback and improvement, and is implemented in all life-cycle phases—design and construction, startup, operation, and decommissioning.

OBJECTIVE 1-A: IMPROVEMENT AND INTEGRATION OF HEALTH AND SAFETY DIRECTIVES

The Board will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of workers and the public. During the strategic planning period, the Board will review and assess proposed new DOE health and safety directives and safety-significant modifications to existing directives. When DOE issues new or modified health and safety directives after addressing the Board's comments, the directives will be in an enhanced form, resulting in improved safety through standardized requirements and guidance that provide for adequate protection of the health and safety of workers and the public.

FY 2001 Performance Goal

The Board and its staff will continue to review and assess the adequacy of health and safety requirements in new directives and rules, as well as in specific DOE directives that may be revised as a result of DOE's 2-year review cycle. Results will be communicated to DOE by the Board or its staff for incorporation or resolution, as appropriate.

Based on past experience and an anticipated modest decrease in the number of new directives, it is estimated that DOE will issue a minimum of 34 directives for review by the Board and its staff in FY 2001. Based on experience from FY 1999 and FY 2000, it is expected that approximately three of these reviews will be of major significance, and as such will require substantial interaction with DOE on the part of the Board and its staff to resolve identified issues satisfactorily prior to finalization.

The Board will place particular emphasis on encouraging DOE to develop necessary new directives and to improve, consolidate, and integrate existing directives and rules related to health and safety in the following areas:

- ! Effective conduct of hazardous facility, site, and complex-wide projects and programs, including roles, responsibilities, competencies, mechanisms, and training;

- ! Sound safety management and systems engineering throughout the complete facility life cycle; and
- ! Adequate performance measures for determining the effectiveness of sites' ISM programs.

As a result of these reviews, new or modified health and safety directives will be issued in an enhanced form, resulting in improved safety through standardized requirements and guidance that provide for adequate protection of workers and the public.

FY 2001 Performance

In the first quarter of FY 2001, the Board's staff provided comments to DOE on four draft directives that had been received during FY 2000. These four directives were issued by DOE later in the year after comments by the Board and others had been resolved. During FY 2001, the Board received another 30 new or revised drafts of health and safety directives and associated standards from DOE for review. Substantive comments were provided on 24 of these documents. On 1 of the remaining 6 (DOE Manual 140.1-1B, *Interface with the Defense Nuclear Facilities Board*), the Board's staff had noted that it had no comments to offer; 2 had been placed on hold status at DOE's request; and the remaining 3 (OCSH-0003, [DOE-STD-XXXX-YR, *Safety and Health Program for DOE Construction Projects*], NBPHZ-0001, [DOE-STD-1020-XX, *Natural Phenomena Hazards Design and Evolution Criteria for Department of Energy Facilities*], and DOE Order 203.X, *Software Quality Assurance*) were still under review at year's end.

Reviews of Directives and Standards Associated with Operations Involving Nuclear Explosives. The Board's staff reviewed and provided extensive comments to DOE representatives on DOE Order 452.1B, *Nuclear Explosive and Weapon Surety Program*; DOE Order 452.2B, *Safety of Nuclear Explosive Operations*; DOE Order 452.4A, *Security and Control of Nuclear Explosives and Nuclear Weapons*; and DOE Standard-3015, *Nuclear Explosive Safety Study Process*. **Outcome: Guidance for these sensitive activities was improved.**

Emergency Management. The Board's staff provided comments concerning the latest revisions of two DOE Orders addressing emergency preparedness: DOE Order 151.1B, *Comprehensive Emergency Management System*, and DOE Order 153.X, *Departmental Radiological Emergency Response Assets*. Comments were also provided on three associated manuals: DOE Manual 151.1-1, *Operational Emergency Hazardous Material Programs for Fixed Facilities and Associated On-Site Activities*; DOE Manual 151.1-2, *Emergency Management Program for Transportation Safeguards System Activities*; and DOE Manual 151.1-3, *Emergency Management Program for Non-Weapons Off-Site Transportation Activities*. **Outcome: The clarity and effectiveness of these directives improved.**

Authorization Basis Documentation. A series of DOE directives associated with the development and implementation of safety basis documentation was reviewed by the Board's staff. These included DOE Order 420.1A, *Facility Safety*, and three associated Guides: DOE Guide 421.1-2, *Implementation Guide for Use in Developing Documented Safety Analyses to Meet Subpart B of 10 CFR 830*; DOE Guide 423.1-1, *Implementation Guide for Use in Developing Technical Safety Requirements*; and DOE Guide 424.1-1, *Implementation Guide for Use in Addressing Unresolved Safety Question Requirements*. **Outcome: New and substantive guidance for preparing and documenting safety analyses was developed.**

Assignment of Authorities and Responsibilities. Comments by the Board's staff on a revision of DOE Manual 411.1B, *Safety Management Functions, Responsibilities, and Authorities Manual*, helped clarify formerly confusing portions of this important directive. **Outcome: Clearer guidance on how safety management activities are to be delegated was developed; further improvement is warranted.**

Software Quality Assurance. The Board continued to urge DOE to strengthen its guidance on engineering practices for safety-related software. Early in FY 2001, DOE sent the Board a corrective action plan, which the Board found to be lacking. Based on the shortcomings in that plan, the Board requested that DOE revise it.

The Board also held three public meetings during the fiscal year to explore software engineering practices of the Department of Defense (DoD), the National Aeronautics and Space Administration (NASA), and the chemical and nuclear power industries. The Board's staff conducted reviews at the Y-12 National Security Complex (Y-12), Sandia National Laboratories (SNL), the Pantex Plant, and the Hanford Site to determine the extent of implementation problems at the site level. The staff also visited NASA's Independent Verification and Validation Center in West Virginia to collect lessons learned.

DOE is preparing a revised corrective action plan to address issues raised in the public meetings and in staff reviews. At year's end, the Board had just received DOE Order 203.X, *Software Quality Assurance*, and initiated its review of that directive. **Outcome: DOE's awareness of the need to strengthen its quality assurance program as applied to safety-related software was heightened.**

OBJECTIVE 1-B: TECHNICAL COMPETENCE

The Board and its staff will verify that roles, responsibilities, experience, and competencies required to protect workers and the public are explicitly defined and implemented for both DOE and its contractor personnel.

FY 2001 Performance Goal

The Board and its staff will conduct the following types of assessments:

- ! Review the status of implementation and institutionalization of the Federal Technical Capability Program at the DOE site level.
- ! Assess the implementation of the system engineer program in the federal and contractor workforce in accordance with DOE's Implementation Plan for the Board's Recommendation 2000-2, *Configuration Management, Vital Safety Systems*.
- ! Assess whether competence is commensurate with the assigned responsibilities of key safety management personnel of defense nuclear contractors as part of readiness determinations for DOE and its contractors.
- ! Evaluate at the site level DOE's 5-year plan for maintaining a viable criticality safety infrastructure to ensure that the issues identified in the FY 2000 complex-wide criticality safety reviews performed by the Board's staff and DOE's Office of Environment, Safety, and Health are addressed. These issues include the need to increase the field presence of federal criticality safety personnel and to improve the formality and rigor of DOE's oversight efforts.
- ! Assess DOE's plan to develop and implement a qualification program for project managers. This assessment will include an assessment of the program's level of technical rigor.

Results of these assessments will be communicated to DOE to enhance its understanding of safety-related roles and responsibilities in support of its execution of functions associated with protecting workers and the public, as well as to upgrade the quality of DOE's technical workforce.

FY 2001 Performance

The report of the Senate Armed Services Committee that accompanied S. 1085, the Bill establishing the Board, includes the following statement: "The Board is expected to raise the technical expertise of DOE substantially" Since its inception, the Board has continually stressed to senior DOE managers the absolute necessity of providing the highest possible level of technical expertise for members of DOE's staff, both at Headquarters and in field elements responsible for overseeing DOE's contractors. With constant urging from the Board, DOE made progress in this area in FY 2001, especially in its Facility Representative program. However, much remains to be done.

Federal Technical Capability Program. In 2001, the Board continued to emphasize to DOE the need to improve its technical workforce. Board members met with the Secretary of Energy, senior DOE officials, and the Federal Technical Capability Panel to discuss the need to take aggressive action to recruit and retain sufficient critical scientific and technical staff to meet identified mission requirements.

In June 2001, the Board's staff conducted a review of the institutionalization of the Federal Technical Capability Program at the Albuquerque Operations Office (ALO), the Kirtland Area Office (KAO), and the Los Alamos Area Office (LAAO). This review disclosed that the technical qualification program in these offices continued to languish, as had been reported previously in DOE's own independent assessment of April 2000. Based on the review by its staff, the Board wrote to DOE suggesting that both LAAO and KAO might not be adequately staffed to handle their mission requirements and safety management functions. The Board also noted that DOE management did not appear to be fully committed to hiring the highly qualified technical personnel required to perform vital safety management functions and meet mission requirements. **Outcome: The DOE Federal Technical Capability Panel has been re-invigorated and is actively working to ensure that DOE can recruit and retain the high- caliber technical professionals needed to achieve its mission. Senior managers in ALO agreed to devote greater attention to required staffing levels and the qualifications of the technical staff.**

Safety Management Personnel. The Board and its staff continued to assess the competence of key safety personnel at defense nuclear facilities. During a review at Lawrence Livermore National Laboratory (LLNL), substantial improvements were observed in the staff of the Nuclear Material Technology Program who are actively involved in planning and controlling nuclear activities at the facility.

At Y-12, the Board's Site Representative, working in concert with a DOE Facility Representative, identified deficiencies in the contractor's program for certification of fissile material handlers and weaknesses in controlling the actions of workers who had not completed their qualifications/certifications. In February 2001, Y-12 reinstated proper controls over these workers. As of June 2001, approximately 150 fissile material handlers had been properly reclassified and completed their certifications. **Outcome: Qualifications of key safety personnel at defense nuclear facilities were upgraded.**

Start-up of the National Nuclear Security Administration (NNSA). In November 2000, the Board discussed the difficulties that the newly created NNSA was experiencing in the start-up of operations with NNSA officials. Subsequent to these discussions, the Board detailed its General Manager to help the NNSA as a loaned executive. During his four month detail assignment at NNSA, the General Manager developed numerous policy and position papers on human resource issues affecting 2300 existing NNSA staff and co-chaired the NNSA Reorganization Task Group that defined major functions and associated resource needs. In July 2001, the General

Manager prepared and presented 4 briefings to Congressional staff explaining the details of several NNSA legislative proposals on the use of excepted service personnel authorities to overcome technical staffing problems in NNSA headquarters and field operations. **Outcome: Using the expertise developed by the Board, the NNSA established the infrastructure necessary to take advantage of its excepted service authority. However, neither DOE nor NNSA have satisfied the Board's expectation regarding actually hiring technically-competent safety professionals using this authority.**

System Engineers. The Board's Recommendation 2000-2, *Configuration Management, Vital Safety Systems*, urged DOE to develop formal training and qualification requirements for competent subject matter experts for vital safety systems (system engineers) in both federal and contractor organizations. As part of its response to this Recommendation, DOE issued a significant modification to DOE Order 420.1, *Facility Safety*, defining responsibilities and training requirements for contractors' system engineers. In addition, DOE Order 433.1, *Maintenance Management Program for DOE Nuclear Facilities*, was revised to include requirements for establishing a system engineer program for the management of vital safety systems.

The Board and its staff continue to emphasize to DOE the need to develop criteria for, and to hire, system engineers for vital safety systems. In this connection, many of the commitments included in DOE's Implementation Plan for Recommendation 2000-2 are significantly overdue. In a July 2001 letter to the Board, DOE committed to expediting actions on these key commitments. **Outcome: DOE issued requirements for system engineers. Site contractors are establishing programs, or modifying existing programs, to ensure that engineers with the requisite technical expertise in design basis, operating limits, and configuration management for vital safety systems are assigned.**

Nuclear Criticality Safety Program. A major accomplishment of DOE'S nuclear criticality safety program in FY 2001 was the completion of all remaining milestones established in DOE's Implementation Plan for the Board's Recommendation 97-2, *Criticality Safety*.

In February 2001, the Board issued a technical report, *Criticality Safety at Department of Energy Defense Nuclear Facilities* (DNFSB/TECH-29) containing several additional suggestions for improving criticality safety throughout the complex. In its response to the Board, DOE addressed a number of observations outlined in the report.

Although the Board considered the overall vision and goals in the DOE response to be laudable, some of the proposed corrective actions lacked sufficient detail to ensure that the issues identified by the Board would be adequately addressed. A July 2001 letter from the Board identified specific actions that needed to be taken before the criticality infrastructure envisioned in Recommendation 97-2, *Criticality Safety*, could be considered adequate. These actions included the following:

- ! Establishment of a stable funding mechanism to support the nuclear criticality safety program,
- ! Steps to be taken to ensure the long-term availability of an experimental criticality test facility for hands-on training of criticality engineers,
- ! Assessment by DOE of the qualifications of its contractors' nuclear criticality safety engineers,
- ! Review of the Implementation Guides for the Nuclear Safety Rule (10 Code of Federal Regulations [CFR] 830) by the Criticality Safety Support Group, and
- ! Establishment of a strong criticality safety group within DOE's field offices to ensure that the site nuclear criticality safety program is functioning properly.

All of these actions have been completed or are in progress. **Outcome: DOE and its contractors are establishing a more robust nuclear criticality safety program.**

OBJECTIVE 1-C: COMPLEX-WIDE IMPLEMENTATION OF INTEGRATED SAFETY MANAGEMENT

The Board will verify the effective and expeditious development and implementation of ISM in facility design and construction, operation, and post-operation. During the strategic planning period, the Board will review the development and implementation of DOE's ISM program, including the effectiveness of DOE's feedback and improvement function. Needed improvements will be communicated to DOE, and this information will be used to continually upgrade the quality of the safety management program. The Board will also review design and construction activities, including technical project management, criteria development, design preparation, and construction, and identify any issues that require resolution to provide adequate protection of workers and the public. Candidates for review will be based on relative hazards and on DOE's schedule for and progress on the candidate facilities. An adequate approach and schedule for the resolution of issues identified by the Board will be established to support safe startup and operation of new or modified defense nuclear facilities.

FY 2001 Performance Goal

The Board and its staff will conduct reviews of DOE's efforts to implement ISM throughout all facility life-cycle phases. Candidates for review include the following:

- ! Tritium Extraction Facility at the Savannah River Site (SRS)—Assess detailed process hazards studies and the quality assurance program for equipment procurement and facility

construction, and perform a detailed structural review of the facility design prior to the start of construction.

- ! Pit Disassembly and Conversion Facility at SRS—Evaluate the adequacy of and identify major safety issues associated with trade-off studies, Title I design, and preliminary hazards analysis.
- ! Hanford Spent Nuclear Fuel Project—Assess hazards studies and Safety Analysis Reports, construction, equipment operational testing, procedures, and operator training.
- ! Other DOE design/construction activities—Assess safety management, criteria development, design development, and construction. Reviews will be based on relative hazards, and on DOE’s schedule for and progress on candidate facilities (e.g., Tritium Consolidation Project, Highly Enriched Uranium (HEU) Materials Facility, and Waste Treatment Plant).
- ! At least one ISM review by DOE’s Office of Oversight and at least two annual DOE ISM reviews (one Environmental Management site and one NNSA site) for quality and effectiveness.
- ! Activity-level implementation of ISM at sites with higher-than-expected rates of occurrences related to worker protection.
- ! Authorization Agreements for weapons activities at the Pantex Plant, as well as selected Authorization Agreements for other defense nuclear facilities and activities.
- ! Authorization basis documents at two defense nuclear sites to ensure that hazards are adequately identified and controls are in place to prevent unwanted events, as well as to ensure that hazard assessments are integrated with emergency management activities.

As a result of these reviews, DOE will provide adequate approaches and schedules for the resolution of identified issues at new or modified defense nuclear facilities.

FY 2001 Performance

More than a year ago, DOE achieved a major goal in its commitment to ISM, articulated in DOE Policy 450.4, *Safety Management System Policy*. By that time, virtually all sites had verified through comprehensive assessments that the basic elements of ISM had been implemented, and Authorization Agreements setting forth operational terms and conditions had been established for all high-hazard facilities. Although this was a commendable achievement, it was recognized that full implementation of ISM was not yet a reality complex-wide. DOE’s verification reviews identified areas

for improvement and follow-on efforts. The Board continued to focus on specific areas of ISM implementation during FY 2001.

Application of Error Analysis to Authorization Basis Documents. Several DOE contractors argued that the methodology for identification of safety-class and safety-significant structures, systems, and components, as set forth in DOE Standard 3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*, was overly conservative and proposed an alternative methodology. The Board discouraged use of this alternative methodology in a November 2000 letter, followed by a formal reporting requirement in April 2001. The Board's review led to the conclusion that the proposed methodology would reduce the conservatism of the currently acceptable approach by using a probabilistic combination of uncertainties or errors in calculating unmitigated consequences. In response, DOE agreed with the Board's position and prohibited the use of this alternative methodology pending further studies. **Outcome: DOE agreed to continue using a conservative methodology for identifying safety-class and safety-significant structures, systems, and components.**

Nuclear Quality Assurance and Software Quality Assurance. During FY 2001, the Board continued to raise issues involving a lack of suitable rigor in DOE's execution of its quality assurance (QA) programs. The Board held three public meetings on the subject and issued a technical report, *Engineering Quality into Safety Systems* (DNFSB/TECH-31) that provided additional insight into these QA issues. In response to the Board's urging, DOE performed extensive assessments of QA programs throughout the complex. These assessments confirmed the Board's concerns. DOE's development of corrective action plans to address the identified issues is under way.

In January 2000, the Board's technical report *Quality Assurance for Safety-Related Software at Department of Energy Defense Nuclear Facilities* (DNFSB/TECH-25) identified issues associated with DOE's development and maintenance of computer software used for safety analysis; design of safety-class structures, systems and components; and control of safety systems. In October 2000, DOE provided a corrective action plan that partially addressed these issues.

During its public meetings on QA, the Board stressed the importance of software QA and explored approaches used by DoD, NASA, and the chemical and nuclear power industries. DOE is developing a QA improvement plan that will also include actions to improve DOE's software QA program. **Outcome: DOE has agreed to develop and implement a QA improvement program that will address the QA issues raised by the Board.**

Integrated Hazard Analysis Reviews. The Board's reviews at several DOE sites indicated that requirements for hazard analyses have not been sufficiently integrated to ensure identification and implementation of adequate controls over the process. Consequently, hazard analyses performed for Safety Analysis Reports, Emergency Response Plans, Environmental Impact Assessments, and Fire

Safety Plans may not be adequate. A series of letters from the Board in early 2001 identified additional hazards that had been overlooked at LLNL (January), Los Alamos National Laboratory (LANL) (March), and Y-12 (April). These letters also called for needed improvements and additional controls to improve operational safety. **Outcome: DOE and its contractors are working to ensure that hazard analyses are integrated, and adequate controls are identified and implemented.**

Recommendation 2000-2. The Board's Recommendation 2000-2, *Configuration Management, Vital Safety Systems*, addressed the degradation of safety systems. It called upon DOE to assess the condition of vital safety systems, designate technically competent system engineers, codify this program in the DOE Directives System, and ensure that the requisite technical expertise to monitor and oversee these systems is available on the DOE staff. DOE provided an Implementation Plan for this Recommendation in October 2000, and the Board accepted this plan in mid-December 2000. DOE subsequently completed initial reviews of vital safety systems at priority facilities and conducted detailed pilot reviews of confinement ventilation systems at two facilities. **Outcome: DOE developed an Implementation Plan in response to the Board's Recommendation that will result in more thorough understanding of the issues and systems involved, as well as better design control and configuration management of vital safety systems.**

Design of Tritium Extraction Facility. The Tritium Extraction Facility, currently under construction at SRS, will extract tritium from target rods irradiated in a commercial light water reactor. The extracted tritium will be used to replenish tritium reserves for the nation's nuclear weapon stockpile. The Board reviewed the application of ISM to the facility's design process to ensure that hazards were identified and appropriate controls developed. The Board's review identified several necessary improvements, including the need to address the potential impact of water on electrical/electronic components, the need for additional high-range gamma monitors, and the need to improve structural response to potential earthquakes. In response, DOE modified the design criteria, completed enhanced seismic response calculations, and improved its program for ensuring quality construction. **Outcome: DOE and its contractor made design changes to improve the safety posture of the facility.**

Hanford Spent Nuclear Fuel Project. The review by the Board's staff of the Hanford Spent Nuclear Fuel Project was documented in DNFSB/TECH-30, *Safety Review of the Hanford Spent Nuclear Fuel Project During the Design and Construction Phase*, issued in February 2001. This report described safety issues identified by the Board's staff and their resolution. In a March 2001 letter on the subject, the Board stated that the lessons learned identified in the report—including experience regarding QA, preoperational testing, phased preparation of Safety Analysis Reports, and design reviews—should be applied to ongoing projects throughout the defense nuclear complex. **Outcome: Safety management of this critical project was strengthened.**

Implementation of Integrated Safety Management. The Board has monitored and guided DOE's implementation of ISM on a continuing basis since Recommendation 95-2, *Safety*

Management, was issued. By the end of FY 2000, all sites had declared ISM fully implemented, with the exception of LANL and certain activities at the Nevada Test Site (NTS) and Y-12. During FY 2001, DOE completed implementation at all sites. Throughout the year, the Board stressed the need to look beyond initial implementation to ensure continued improvement of ISM. Also in FY 2001, the Board held two public meetings to discuss ISM implementation in detail. DOE has committed to using its feedback and improvement programs, including its annual ISM update process, to ensure continued improvement. By the end of the year, the Board's reviews had raised questions about the efficacy of these programs. DOE has committed to correcting the programs as necessary. **Outcome: Implementation of the basic elements of ISM has been accomplished at all DOE sites, and DOE has committed to evaluating its ISM improvement programs.**

GOAL 2: SAFE STEWARDSHIP OF NUCLEAR WEAPONS STOCKPILE AND COMPONENTS

Safe execution of support for the nuclear weapons stockpile and defense nuclear research activities at DOE's defense nuclear facilities has continued. The objectives and annual performance goals under Goal 2 address the Board's efforts to support DOE's safe execution of its national security mission. Achieving that goal requires that the Board and its staff evaluate DOE's work at multiple sites in direct support of the nuclear weapons stockpile, as well as associated research and development. The two strategic objectives that support this general goal address the safe execution of various activities within DOE's two primary nuclear weapon mission components: direct support of the stockpile, and nuclear weapon research and development activities.

OBJECTIVE 2-A: SAFE CONDUCT OF STOCKPILE MANAGEMENT

The Board and its staff will verify the safety of DOE's defense nuclear facilities and activities relating to maintenance, storage, and dismantlement of the nuclear weapon stockpile.

FY 2001 Performance Goal

The Board and its staff will conduct assessments of DOE's efforts to develop and implement safety management systems for stockpile management activities. The Board will review safety system development (e.g., system and process designs, safety bases, control schemes, and administrative programs) and implementation of safety management systems. These reviews will focus on activities at the Pantex Plant, Y-12, and SRS tritium facilities. Candidate areas for review by the Board and its staff include:

- ! Weapon Safety Specifications and/or Hazard Analysis Reports for nuclear weapon activities (e.g., W88);
- ! Safety basis analysis for nuclear weapon activities or facilities (e.g., upgrade of facility safety analyses for fire protection);
- ! Cross-cutting functional areas at the Pantex Plant, Y-12, or SRS tritium facilities (e.g., radiation control, chemical safety);
- ! DOE/contractor Operational Readiness Reviews or other readiness determinations (e.g., W88); and
- ! Special studies of unique or significant hazards at DOE weapon facilities (e.g., hazards of special materials in weapons).

In addition, the Board and its staff will assess the adequacy of development and implementation of the ISM System and safety controls identified for dismantlement projects involving any new weapon systems (such as the W56) at the Pantex Plant or Y-12 that start in FY 2001.

FY 2001 Performance

Repackaging of Plutonium Pits. The Board issued Recommendation 99-1, *Safe Storage of Fissionable Material Called "Pits,"* to urge DOE to improve the storage environment for plutonium pits. DOE achieved the goal of repackaging 200 pits per month in April 2001 and had packaged a total of more than 3000 pits by the end of FY 2001. **Outcome: Plutonium pits are being repackaged from a relatively unprotected environment into a safe, inert environment.**

Operational Readiness at Y-12. The Board and its staff maintained pressure on DOE's Y-12 Area Office (YAO) to demand a higher level of performance from its contractor. This effort succeeded. YAO's review of a recent restart of operations showed the office to be a more demanding customer. The Board and its staff will observe YAO closely to ensure that this trend continues. **Outcome: DOE has improved the safety of new operations by establishing and enforcing clear expectations for the implementation and demonstration of methods designed to ensure the safe conduct of hazardous activities.**

Chemical Safety. Problems with the management of chemical hazards at Y-12 have been highlighted in extensive correspondence from the Board. At Y-12, DOE has responded to the Board's warnings by cataloging and significantly reducing its inventory of excess chemicals. **Outcome: Y-12 has reduced the risk of potential accidents due to the release of hazardous chemicals.**

YAO Staffing. As a result of continued pressure from the Board regarding YAO's technical staffing, the office hired several new Facility Representatives, as well as additional technical personnel.

Outcome: YAO has added technical personnel necessary to fulfill the government's obligations to oversee the safety of its contractors' operations.

Command Disablement Testing at Pantex. The Board raised issues concerning the quality of the authorization basis for command disablement of certain weapon systems. LANL recognized the deficiencies and revised the authorization basis using a combination of new calculations and information not provided in the original basis. The laboratory also agreed to consider new research on the most poorly understood aspects of the authorization basis to enhance confidence in the margin of safety for these operations. **Outcome: DOE has established a technically justifiable safety basis for conducting potentially dangerous operations and has documented this basis for use in future decision making.**

Startup of a New Dismantlement Activity at Y-12. The Board identified a number of potentially significant safety issues associated with the design of a new weapon (secondary) dismantlement process. In response, DOE and its contractor redesigned the process to resolve these safety issues. **Outcome: Changes made to the process for secondary dismantlement significantly improved the safety of the operation.**

Nuclear Explosive Program Activities. The Board continued to urge DOE to simplify and expedite its process for reengineering nuclear explosive processes at Pantex as advised in the Board's Recommendation 98-2, *Safety Management at the Pantex Plant*. During FY 2001, DOE initiated the Seamless Safety for the 21st Century (SS-21) Disassembly & Inspection (D&I) program for the W76. **Outcome: The D&I program for the W76 is being conducted safely using the vastly improved tooling and procedures developed as part of the SS-21 program.**

Fire Protection at Pantex. The Board concluded that the potential hazards from a fire at Pantex had not been addressed comprehensively and consistently. In response, DOE accelerated replacement of the deteriorating plant-wide fire alarm system and improved fire hazard analyses addressing the fire risks in the bays and cells. DOE also revised Technical Safety Requirements and restored ultraviolet detectors as initiating devices for the fire protection system. **Outcome: DOE implemented more robust, engineered safety controls to reduce the threat of fires to nuclear explosive operations.**

Nuclear Material Storage Facilities. In response to the Board's urging, Y-12 developed a 10-year plan for consolidating nuclear material in many deteriorating nuclear storage facilities and actively managing the materials. The contractor relocated all material from the building in the worst physical condition and initiated removal of material from another building. The contractor has also begun to integrate long-range facility planning with planning for storage requirements. **Outcome: DOE has substantially improved the storage conditions of nuclear material and has developed a process to prevent the recurrence of hazardous storage situations.**

Lightning Protection at Pantex. During FY 2001, DOE proposed relaxation of certain lightning protection controls at Pantex over the objections of both the design agencies and DOE's Nuclear Explosive Safety Study Group. The Board intervened to emphasize the need for DOE to maintain technically justified controls for all nuclear explosive operations. As a result, DOE retained the controls. **Outcome: The Pantex lightning protection program continues to control the risk of lightning to nuclear explosive operations.**

Corrective Action Plan for Y-12's Fire Protection. In response to issues emphasized by the Board, Y-12 prepared a thorough and detailed 10-year corrective action plan for its fire protection program. Most of the short-term actions identified in the plan have been completed. **Outcome: Long-standing safety deficiencies in the fire protection program at Y-12 are being addressed.**

OBJECTIVE 2-B: SAFE CONDUCT OF STOCKPILE STEWARDSHIP

The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.

FY 2001 Performance Goal

The Board and its staff will conduct assessments of DOE's efforts to develop and implement safety management systems for stockpile stewardship activities. The Board will review the development of safety systems (e.g., system and process designs, safety bases, control schemes, and administrative programs) and the implementation of safety management systems. The Board will also review DOE's efforts to address safety issues associated with aging-related changes in nuclear weapon components. These reviews will focus on activities—including research and modeling—at LLNL, LANL, NTS, and SNL. Candidate areas for review by the Board and its staff include the following:

- ! Safety basis analysis and change control for nuclear weapon activities or facilities (e.g., pit production);
- ! Safety controls selected for hazardous activities within the weapons complex;
- ! Cross-cutting functional areas at LANL, LLNL, NTS, and SNL;
- ! ISM work planning process, including activity-specific hazard analysis, identification of controls, and implementation of safety controls (e.g., work-planning at Technical Area-55);
- ! DOE/contractor Operational Readiness Reviews or other readiness determinations (e.g., implementation of new safety controls); and
- ! Aging-related changes in nuclear weapon components for weapon systems in the enduring stockpile.

FY 2001 Performance

Emergency Management at LLNL. The Board identified deficiencies in emergency management at LLNL, including weaknesses in hazard identification and assessment. In response, DOE and LLNL significantly increased senior management's attention in this area and improved emergency hazard analyses and controls. **Outcome: LLNL has significantly improved its emergency management program.**

Fire Protection at LLNL. When the Board disclosed deficiencies that could compromise power and control for smoke detectors and fire dampers in Building 332, LLNL acknowledged the problem and implemented compensatory measures to increase the reliability of the fire alarm system. LLNL is also expediting replacement of the old system with a new safety-class system. **Outcome: LLNL took appropriate action to address reliability problems with a safety-related fire protection system.**

Classified Experiments at LANL. For several years, the Board has stressed the need for robust confinement vessels in which to perform certain potentially hazardous experiments at LANL. In FY 2001, DOE responded by developing a defensible design basis for the confinement vessels to be used for these experiments and a draft standard for the vessels' design and construction. **Outcome: DOE now has a well-developed approach to designing and constructing the confinement vessels needed to control the hazards of these classified experiments.**

Readiness to Dispose of a Damaged Nuclear Weapon at NTS. The Board has consistently highlighted to DOE the need to develop the programs and infrastructure at NTS required to dispose of a damaged nuclear weapon or improvised nuclear device safely. During FY 2001, DOE upgraded its capabilities to conduct these activities safely by making physical improvements to G-Tunnel, developing a safety basis for G-Tunnel, and conducting a number of exercises that clearly identified further issues to be addressed. **Outcome: DOE made significant physical and procedural improvements designed to ensure that it will be prepared to dispose of a damaged nuclear weapon safely should the need arise.**

Subcritical Experiments to be Conducted at NTS. After reviewing the subcritical experiments to be conducted under the Joint Actinide Shock Physics Experimental Research (JASPER) program at NTS, the Board concluded that the quantity of plutonium-238 and -239 in the targets will exceed the threshold values for a Hazard Category 3 nuclear facility. However, suitably rigorous safety controls had not been specified. As a result of a July 2001 letter from the Board, LLNL identified the controls that will be relied upon for safety of the operation, and specified those controls in a document to be made part of JASPER's authorization basis. DOE will assess and approve the adequacy of the controls and their configuration management before this series of experiments begins. **Outcome: Systems and controls important to safety will be identified and maintained from one experiment to the next.**

Special Recovery Line at LANL. A March 2001 letter from the Board noted that LANL's Special Recovery Line represents the only disposition path for a subset of plutonium pits with unique hazards currently stored at the Plant. A lack of funding had nearly resulted in suspending operations and placing the facility in cold standby. The Board suggested that it would be prudent to stabilize funding to maintain the ability of the Special Recovery Line to dispose of vulnerable pits at Pantex should an acute problem arise. **Outcome: NNSA agreed to maintain the availability of the Special Recovery Line pending the identification of a disposition path for the pits in question.**

Safety-Related Research and Development. For several years, the Board has highlighted to DOE the need to improve scientific understanding of certain phenomena that affect the safety of operations at the Pantex Plant. In many cases, the experimental data necessary to evaluate these phenomena are also lacking. In FY 2001, NNSA and its weapon design laboratories agreed to consider new research on the most poorly understood aspects of Pantex operations to enhance confidence in the margin of safety for these operations. In addition, NNSA has institutionalized a process to evaluate and prioritize this research at least semiannually. **Outcome: NNSA is starting to implement a process designed to ensure that safety-related research and development necessary to support safe operations at Pantex is identified, prioritized, and funded.**

GOAL 3. SAFE DISPOSITION OF HAZARDOUS REMNANTS OF WEAPONS PRODUCTION

This goal encompasses safe and effective characterization, stabilization, and storage of hazardous remnants of nuclear weapons production and decommissioning of legacy facilities in a manner that protects workers, the public, and the environment. The objectives and annual performance goals under Goal 3 address the Board's efforts to confirm the safe dispositioning of hazardous legacy materials and facilities associated with nuclear weapons. Achieving that goal requires a multiyear, multifocus, multisite effort extending beyond a single annual performance period. The two strategic objectives that support this general goal address DOE's activities to reduce the risks of legacy materials by appropriate processing and disposition, as well as to decommission production facilities and sites no longer essential to the national security mission.

OBJECTIVE 3-A: MATERIAL STABILIZATION

The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program and provides for expeditious disposal as needed.

FY 2001 Performance Goal

The Board and its staff will conduct assessments of DOE's efforts to characterize, stabilize, process, and safely store plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program to ensure that these efforts are performed safely and that the risks posed by these materials are addressed in a timely manner. These reviews will be conducted using the principles of ISM and will address the adequacy of current storage conditions, proposed treatment and disposal technologies, the design of new facilities and process lines, readiness of facilities to begin new operations safely, the safety of ongoing operations, and the suitability of long-term storage and disposal facilities. Representative areas for review include the following:

- ! Stabilization and packaging of plutonium metal and oxide at the Hanford Site and the Rocky Flats Environmental Technology Site (RFETS) (Recommendation 94-1, *Improved Schedule for Remediation in the Defense Nuclear Facilities Complex*);
- ! Stabilization and disposal of plutonium-bearing solutions and residues at the Hanford Site and RFETS (Recommendation 94-1, *Improved Schedule for Remediation in the Defense Nuclear Facilities Complex*);

- ! Preparations for characterizing, stabilizing, and repackaging uranium-233 materials at Oak Ridge National Laboratory (ORNL) (Recommendation 97-1, *Safe Storage of Uranium-233*);
- ! Designs and technologies for the proposed Plutonium Immobilization Project and Pit Disassembly and Conversion Facility (PDCF), and their interfaces with the proposed mixed oxide fuel fabrication facility;
- ! Design of high-level waste (HLW) treatment facilities at the Hanford Site, and selection of a treatment process for high-level waste liquids and salts at SRS (Recommendation 96-1, *In-Tank Precipitation System at SRS*);
- ! Design, construction, and testing of high-level waste retrieval/transfer systems at the Hanford Site;
- ! Safety of operations at the Waste Isolation Pilot Plant (WIPP) as activities ramp up from initial startup, and preparations to receive remotely handled transuranic (RH-TRU) wastes at WIPP, including preparations at the sites that will be the first to ship such wastes to WIPP;
- ! Implementation of newly issued DOE Order 435.1, *Radioactive Waste Management*, governing all phases of the life cycle of high-level, low-level, transuranic, and mixed wastes; and
- ! Operation of new plutonium storage facilities, such as SRS's K-Area Materials Storage Facility, and modifications to storage vaults at the Hanford Plutonium Finishing Plant.

FY 2001 Performance

Stabilization and Storage of Legacy Materials. In Recommendations 94-1, *Improved Schedule for Remediation in the Defense Nuclear Facilities Complex*, and 2000-1, *Prioritization for Stabilizing Nuclear Materials*, the Board urged DOE to address legacy nuclear materials remaining following the shutdown of many defense nuclear facilities, recognizing that unstable materials and undesirable storage conditions would worsen with time. DOE has since taken action to address some of the most immediate issues, but much of the material has yet to be addressed. In January 2001, in response to issues raised by the Board, DOE provided an updated Implementation Plan for completing stabilization of the remaining materials.

The Board did not fully accept this plan and, in a March 2001 letter to DOE, identified the need to further expedite stabilization activities at SRS and LANL. In its September response to the Board's

letter, DOE presented an acceptable path forward for SRS, but indicated that it was continuing to evaluate whether stabilization activities at LANL could be accelerated. The new approach at SRS is consistent with the Board's observation that stabilization and packaging of plutonium metal and oxide materials could be accomplished in a timely and cost-effective manner using simple equipment in the existing FB-Line facility at SRS. DOE is now making progress towards resolution of the Board's remaining issues. **Outcome: DOE is continuing to stabilize and repackage its inventory of legacy nuclear materials, and is working to improve the schedule and approach for the remaining materials at SRS and LANL.**

Plutonium Stabilization and Packaging. During FY 2001, RFETS, Hanford, and LLNL each began packaging plutonium in high-integrity, long-term storage containers. This activity represents the culmination of several years of preparation, and fulfills a commitment made by DOE in response to the Board's Recommendations 94-1, *Improved Schedule for Remediation in the Defense Nuclear Facilities Complex*, and 2000-1, *Prioritization for Stabilizing Nuclear Materials*, regarding the stabilization of legacy nuclear materials. Also during FY 2001, Hanford began stabilization of the plutonium solutions stored at the Plutonium Finishing Plant, fulfilling another commitment in response to both these Recommendations. **Outcome: Plutonium metal and oxide materials are now being stabilized and packaged in robust containers at three sites.**

Hanford Spent Nuclear Fuel Project. During FY 2001, a major milestone in the implementation of Recommendation 94-1, *Improved Schedule for Remediation in the Defense Nuclear Facilities Complex*, was reached with the startup of stabilization of spent nuclear fuel from the Hanford K-West Basin. The safe startup of this activity followed several years of intensive preparations by DOE, and extensive oversight by the Board that led to the identification and correction of numerous safety issues before operations commenced. **Outcome: Spent nuclear fuel at the Hanford Site is now being retrieved from an aging storage basin, safely stabilized, and packaged in robust containers.**

Americium/Curium Solutions. The need to expedite stabilization of americium/curium solutions at SRS was identified in Recommendation 94-1, *Improved Schedule for Remediation in the Defense Nuclear Facilities Complex*. Previously, DOE had planned to vitrify the material and retain it for future use. Because of increasing cost and the lack of an identified need for the material, however, DOE has stopped work on the vitrification project and now plans to dispose of the material through the SRS high-level waste system. The Board's review of the disposition plan identified several issues. **Outcome: DOE is continuing to investigate the high-level waste option, and all issues raised by the Board are expected to be resolved.**

Uranium-233 Stabilization. Uranium-233 (^{233}U) is a man-made radioisotope that contains uranium-232 (^{232}U) as an unavoidable contaminant; products of the decay of ^{232}U are highly radioactive. Most of this material is stored at ORNL and the Idaho National Engineering and Environmental Laboratory (INEEL), with a smaller quantity at LANL. Because most of the containers

at ORNL have not been inspected for many years, there is uncertainty about the safety of current storage conditions. In Recommendation 97-1, *Safe Storage of Uranium-233*, the Board urged DOE to characterize, stabilize, and ensure safe storage of its ²³³U materials expeditiously. During 2001, the Board completed its review of preparations for the ²³³U inspection and repackaging program at ORNL, as well as DOE's resolution of numerous safety issues identified by the Board, particularly regarding the need for formal conduct of testing and operations. **Outcome: ORNL has commenced inspection of the ²³³U canisters.**

Highly Enriched Uranium. HEU solutions at SRS are being stabilized to meet commitments made by DOE in response to the Board's Recommendation 2000-1. The HEU blend-down project, which will convert the HEU to low-enriched uranium for use in commercial power reactors, achieved several milestones in FY 2001, *Prioritization for Stabilizing Nuclear Materials*. A formal design review for the blend-down project was completed, and the preliminary design report was submitted. The Board's staff reviewed preliminary design and safety basis documents and pointed out areas for improvement in the functional classification of equipment and radiological dose calculations. **Outcome: DOE and its contractor were apprised of potential improvements to the design and safety basis documents that would upgrade the safety posture of the facility.**

HB-Line Phase II at SRS. The Board's staff has evaluated preparations at SRS to start up the HB-Line neptunium/plutonium oxide process. Operation of this process represents an important step toward stabilizing actinide solutions at SRS, as committed to by the Secretary of Energy in DOE's Implementation Plan for the Board's Recommendation 94-1, *Improved Schedule for Remediation in the Defense Nuclear Facilities Complex*. The staff's reviews have included safety authorization basis documents, the design of various systems and equipment, and procedures, as well as observation of simulated operations and drills. A July 2001 letter from the Board communicated a number of safety issues. Resolution of these issues has proceeded, and improvements to the safety basis, supporting technical basis documents, and procedures have been noted. **Outcome: DOE's responses to issues identified by the Board have resulted in improved protection of workers and the public.**

High-Level Waste Management at SRS. In January 2001, Tank 6 in the SRS HLW tank farm leaked waste from the primary tank into the tank's secondary containment. As the result of an unacceptable response by DOE and the contractor, the Board issued Recommendation 2001-1, *High Level Waste Management at SRS*. This Recommendation urged DOE to remove waste from the leaking tank and to take several other actions to improve safety and operational flexibility in the tank farms. The recommended actions included selecting a salt processing technology and accelerating the salt processing project, exploring new options for freeing up additional storage space in the tank farms, and reevaluating the performance-based incentives in the HLW portion of the site contract. **Outcome: DOE removed waste from leaking tanks and developed an Implementation Plan that adequately addresses all aspects of Recommendation 2001-1.**

Processing of High-Level Waste at SRS. In continuing to address issues raised in the Board's Recommendation 96-1, *In-Tank Precipitation System at SRS*, DOE completed an evaluation of HLW salt processing technologies and selected caustic side solvent extraction as the preferred method for salt processing at SRS. The Board reviewed DOE's selection and suggested that another technology be pursued in parallel through pilot-scale operation to better ensure timely stabilization of tank wastes. Additionally, to further expedite waste stabilization and relieve the strain on the HLW tank farms at SRS, the Board encouraged DOE to address the feasibility of direct disposal of low-activity salt wastes through the existing Saltstone Production Facility at SRS. **Outcome: DOE has revisited its salt processing decision and is expected to conduct a feasibility study for direct disposal of certain salt wastes.**

Integrity of High-Level Waste Tanks. The Board has continued to press DOE to improve programs that protect and verify the integrity of the HLW storage tanks at the Hanford Site and SRS. As a result, during FY 2001, DOE made several improvements to its tank integrity program at Hanford. These improvements included adding corrosion inhibitors to tanks with off-specification chemistry, as well as implementing improved requirements for monitoring of tank chemistry and operation of the annulus ventilation systems, both of which help prevent corrosion of the primary tank wall. **Outcome: The actions taken at Hanford in response to the Board's reviews have resulted in safer storage of HLW at the site.**

High-Level Waste Evaporator at SRS. The Board reviewed the safety of cleaning activities intended to remove an unexpected accumulation of solid deposits in one of the HLW evaporators at SRS. These accumulated materials represented hazards associated with criticality and generation of flammable gas. Oversight of the contractor's readiness review by the Board's staff disclosed deficiencies in the contractor's procedures, training, and equipment readiness. The staff's observations were subsequently confirmed by DOE's own review.

The contractor completed corrective actions, and the deposits were removed, but periodic cleaning will be necessary. The Board also reviewed new safety controls developed to address hazards posed by deposits expected to accumulate between cleanings. Based on its review of the new safety controls, the Board wrote to DOE in late September 2001, suggesting that a safety-significant high-level alarm and interlock system be installed to better ensure prevention of potential explosions. **Outcome: DOE has agreed to implement compensatory measures that will allow the safe startup of the evaporator and to install the interlock system.**

L-Area Experimental Facility at SRS. DOE and its contractor started work related to the design and safety basis work for the L-Area Experimental Facility, which will be used to stabilize irradiated research reactor fuel at SRS. The Board reviewed design and safety basis documents and pointed out areas for improvement in electrical safety and in instrumentation and control. **Outcome: DOE and its contractor made corrections to the design and safety basis to improve the safety posture of the facility.**

Transuranic and Low-Level Wastes. The Board's staff performed reviews to help ensure safe disposal of transuranic (TRU) waste at WIPP as that facility continued to ramp up operations toward full throughput capacity. The staff's reviews focused on confirming implementation of the ISM process and configuration management for vital safety systems at WIPP. The staff also examined the construction of facilities at WIPP designed to accommodate disposal of RH-TRU waste to ensure that future operations for RH-TRU disposal can be carried out safely. In addition, the Board's staff reviewed design and construction activities for the Melton Valley Waste Treatment and Packaging Facility at ORNL. This facility will prepare TRU and RH-TRU wastes for disposal at WIPP, and low-level waste for disposal at NTS. **Outcome: The reviews performed by the Board's staff confirmed continuing safe operations at WIPP and contributed to design improvements for the ORNL waste facility, including the addition of a fire suppression system.**

Pit Disassembly and Conversion Facility. The Board continued to evaluate the developing design of the planned PDCF and provided comments to DOE's Office of Fissile Materials Disposition on safety aspects of the design. In an April 2001 letter, DOE conveyed to the Board its decision to adopt conservative seismic design criteria for the PDCF, consistent with earlier comments from the Board. DOE has completed additional geotechnical characterization of the PDCF site as well. Also consistent with the Board's comments, DOE agreed to perform a full-facility criticality safety analysis instead of using a piecemeal approach, and to use the Implementation Guides for DOE Order 420.1, *Facility Safety*. **Outcome: DOE has chosen conservative design criteria for the seismic design and criticality safety of the PDCF.**

OBJECTIVE 3-B: FACILITY DECOMMISSIONING

The Board and its staff will verify DOE's aggressive pursuit of the safe decommissioning of excess defense nuclear facilities that pose a significant risk to workers or the public.

FY 2001 Performance Goal

The Board and its staff will conduct assessments of the adequacy of plans, standards, procedures, and execution for activities associated with decommissioning of DOE's defense nuclear facilities. These assessments will be conducted using the principles of ISM to ensure that decommissioning efforts are performed safely. Additionally, the Board and its staff will continue efforts to confirm that high-risk facilities are decommissioned in a timely manner. These assessments are conducted in collaboration with state and other regulatory authorities as needed, and on a schedule that supports DOE's operational plans. Representative areas for review by the Board and its staff include the following:

- ! The Canyon Disposition Initiative at the Hanford Site;

- ! Building 707, 771, or 776 at RFETS;
- ! Building 9206 at ORNL;
- ! Decommissioning activity at the Miamisburg Environmental Management Project (MEMP);
and
- ! Plans for closure of HLW tanks at INEEL.

FY 2001 Performance

Y-12 Building 9206. For several years, the Board has pressed DOE to pursue risk reduction and deactivation activities in Building 9206 at Y-12. In early FY 2001, shortly after an on-site review, the Board wrote to DOE noting that although three accomplishments had been made in support of deactivation and risk reduction, the hazards of most concern to the Board had not been markedly alleviated. During a follow-up review in May 2001, the Board's staff noted that significant steps had been taken to raise the priority of hazard reduction. The staff also observed that more aggressive efforts were being considered, including reclassifying some materials as waste to support timely direct disposal. The Board finds it encouraging that a recently issued revision to the baseline plan for the facility presents an accelerated option under which deactivation is completed in 6 years. Activities to stabilize pyrophoric material are proceeding, with an Operational Readiness Review expected before the end of CY 2001.

The Board had long urged that a survey be performed of underground ventilation ductwork suspected of being contaminated with fissile uranium. This project was completed during 2001. Initial results suggest that uranium levels are low enough that the potential for a criticality event is remote.

Outcome: Progress is now being made in remediating the hazards posed by this facility.

Miamisburg Environmental Management Project. During FY 2001, the Board's staff followed progress on deactivation and decommissioning of facilities formerly used for tritium research and development. In addition, the staff reviewed occurrence reports that involved worker health and safety directly. Radioactive contamination and exposure events and methods by which they could be prevented were discussed during periodic conference calls with the site. The staff also followed the development of proposed changes to the internal programs for radiation monitoring and dose assessment. These proposed changes are aimed at better protecting workers in a more cost effective manner. **Outcome: The improvements made in safety programs have enhanced worker protection at MEMP.**

Hanford Site. During FY 2001, the Board's staff continued to review deactivation and decommissioning efforts at Hanford. Comments regarding safety were provided to the contractor; changes were subsequently made, and improvements were evident. The Board also evaluated the

sitewide approach to disposition of excess facilities at the Hanford Site, and in a letter to DOE in August 2001, provided suggestions for improving the processes used to manage such work. A significant event that occurred in FY 2001 as a result of the Board's effort was the startup of facility characterization activities at the defunct Bulk Reduction Building (224-T). **Outcome: The safety of deactivation work has been improved, and work to characterize the hazards in Building 224-T has begun.**

Rocky Flats Environmental Technology Site. The Board and its staff observed deactivation and decommissioning work activities in the field, and reviewed various planning and authorization basis documents. During these reviews, the staff engaged RFETS management personnel on various technical issues.

RFETS continues to improve engineered controls and cutting methods used during size reduction of equipment. In FY 2001, a second-generation containment device employing plasma-arc cutting was used. A third-generation containment device, also employing plasma-arc cutting, was designed, and installation was largely completed in Buildings 776 and 771. This latest design may eliminate the need for workers to wear respiratory protection during size reduction. It is encouraging to note that RFETS is enhancing worker protection through continued improvement of engineered controls, a goal the Board has long embraced.

The Board's staff also provided comments regarding work planning and control activities. The Board has noted improved promulgation of guidance and revised documents, apparently as a result of increased management attention. **Outcome: Improvements in work planning and control have resulted in greater protection to the workers at RFETS.**

LIST OF ABBREVIATIONS AND ACRONYMS

ALO	(Department of Energy) Albuquerque Operations Office
Board	Defense Nuclear Facilities Safety Board
CFR	Code of Federal Regulations
CY	calendar year
D&I	Disassembly and Inspection
DoD	Department of Defense
DOE	(U.S.) Department of Energy
FY	fiscal year
GPRA	Government Performance and Results Act
HEU	highly enriched uranium
HLW	high-level (radioactive) waste
INEEL	Idaho National Engineering and Environmental Laboratory
ISM	Integrated Safety Management
JASPER	Joint Actinide Shock Physics Experimental Research
KAO	(Department of Energy) Kirtland Area Office
LAO	(Department of Energy) Los Alamos Area Office
LANL	Los Alamos National Laboratory
LLNL	Lawrence Livermore National Laboratory
MEMP	Miamisburg Environmental Management Project
NASA	National Aeronautics and Space Administration
NNSA	National Nuclear Security Administration
NTS	(Department of Energy) Nevada Test Site
PDCF	Pit Disassembly and Conversion Facility (at SRS)
ORNL	Oak Ridge National Laboratory
QA	quality assurance
RFETS	Rocky Flats Environmental Technology Site
RH-TRU	remotely handled transuranic (waste)
SNL	Sandia National Laboratories
SRS	Savannah River Site
SS-21	Seamless Safety for the 21 st Century
TEF	Tritium Extraction Facility
TRU	transuranic (waste)
WIPP	Waste Isolation Pilot Plant
Y-12	Y-12 National Security Complex
YAO	(Department of Energy) Y-12 Area Office
²³² U	uranium-232
²³³ U	uranium-233

