FIFTEENTH ANNUAL REPORT

TO CONGRESS

DEFENSE NUCLEAR FACILITIES
SAFETY BOARD

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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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To the Congress of the United States:

The Defense Nuclear Facilities Safety Board (Board) is pleased to submit to Congress its Fifteenth Annual Report. The Board is an independent executive branch agency responsible for providing advice and recommendations to the Secretary of Energy, and to the President if necessary, regarding public health and safety issues at Department of Energy (DOE) defense nuclear facilities.

As required by statute, the Board's report summarizes activities during calendar year 2004, assesses improvements in the safety of DOE defense nuclear facilities, and identifies remaining health and safety problems.

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PREFACE

Congress created the Defense Nuclear Facilities Safety Board (Board) as an independent agency within the Executive Branch (42 U.S.C. § 2286, *et seq*.) to identify the nature and consequences of potential threats to public health and safety at the Department of Energy's (DOE's) defense nuclear facilities, to elevate such issues to the highest levels of authority, and to inform the public.

The Board is required to review and evaluate the content and implementation of health and safety standards, including DOE's orders, rules, and other safety requirements, practices, and events relating to system design, construction, operation, and decommissioning of DOE's defense nuclear facilities. The Board makes recommendations to the Secretary of Energy that the Board believes are necessary to ensure adequate protection of public health and safety. The Board must consider the technical and economic feasibility of implementing the recommended measures. The Secretary may accept in whole or in part or reject the recommendations. If the Secretary rejects a recommendation in whole or in part for any reason, the Board does not withdraw or modify the recommendation, and the Secretary maintains the rejection, the Secretary's decision and reasoning must be published in the *Federal Register* and provided to both Houses of Congress. The Secretary must report to the President and Congress if implementation of a recommendation is impracticable because of budgetary considerations. Should the Board determine that an imminent or severe threat to public health or safety exists, the Board must transmit its recommendation to the President and the Secretaries of Energy and Defense.

The Board may conduct investigations, issue subpoenas, hold public hearings, gather information, conduct studies, and take other actions such as establishing reporting requirements for DOE in furtherance of its oversight of health and safety at defense nuclear facilities. The Board has noted that the use of requests to the Secretary of Energy for detailed reports on safety issues raised by the Board has regularly resulted in prompt remedial actions by DOE.

The Board is required by law to submit an annual report to the Committees on Armed Services and Appropriations of the Senate and to the Speaker of the House of Representatives. This report is to include all recommendations made by the Board during the preceding year, and an assessment of: (1) the improvements in the safety of DOE's defense nuclear facilities during the period covered by the report; (2) the improvements in the safety of DOE's defense nuclear facilities resulting from actions taken by the Board or taken on the basis of the activities of the Board; and (3) the outstanding safety problems, if any, of DOE's defense nuclear facilities.

EXECUTIVE SUMMARY

The nuclear weapons program of the Department of Energy (DOE), which includes nuclear weapons operations conducted by the National Nuclear Security Administration (NNSA), is a complex and hazardous enterprise. Missions include maintenance of the national nuclear arsenal, dismantlement of surplus weapons, stabilization and storage of surplus nuclear materials, disposition and disposal of hazardous waste, and cleanup of surplus facilities and sites. Some of these missions are carried out with aging facilities; others demand the construction of new facilities. The constant vigilance of the Defense Nuclear Facilities Safety Board (Board) is required to ensure that all of these activities are carried out by DOE in a manner that protects the public, workers, and environment.

During this past year, actions by the Board resulted in numerous health and safety improvements that are summarized briefly below and in more depth in the main body of the report. These improvements are described along the lines of the Board's four strategic areas of concentration:

- Nuclear Weapons Operations;
- Nuclear Materials Processing and Stabilization;
- Nuclear Facilities Design and Infrastructure; and
- Nuclear Safety Programs and Analysis.

NUCLEAR WEAPONS OPERATIONS

The Board's strategic performance goal for this area is to ensure that DOE operations directly supporting the nuclear stockpile and defense nuclear research are conducted in a manner that provides adequate protection of the health and safety of the workers and the public. The Board's safety oversight activities in this area focus on assembly and disassembly of weapons; processing and storage of tritium; and research, development, manufacturing, and testing.

As a result of the Board's efforts during 2004, DOE has taken actions to upgrade the safety of these activities. These actions include improving safety systems and controls in aging facilities, achieving safe packaging of nuclear weapon materials, improving the formality of nuclear explosive and nuclear processing operations, enhancing the quality of engineered safety systems, and correcting deficiencies in the safety bases for new and ongoing activities.

Specific examples of safety improvements in weapons operations made by DOE in consequence of the Board's work are as follows.

All weapons laboratories:

- DOE established a requirement at each site office to track and ensure closure of nuclear safety support requirements for weapon laboratories.

Pantex Plant:

- Pits of fissionable material have been repackaged into sturdy containers suitable for interim storage (Recommendation 99-1).

- The project to improve safety and restart nuclear explosive operations in Building 12-64 now includes seismic enhancements to the facility as well as surge suppression upgrades.

- Improvements were made in several key safety management programs including tooling and Unreviewed Safety Questions.

- DOE completed disassembly of the W78 nuclear weapon using the Seamless Safety process, and is preparing to dismantle other weapons by the same method.

Y-12 National Security Complex:

- Systems in the Oxide Conversion Facility were enhanced by new safety interlocks, enhanced seismic reinforcement, and modifications to improve alarm management.

- DOE initiated a project to upgrade the Fire Suppression System in the B-1 Wing of Building 9212.

- DOE standardized and reduced the different types of containers used for material storage, thus simplifying requirements for operators and allowing better long-term management of nuclear material in storage.

- The knowledge preservation process was restarted to capture safety-related information from retiring experts; this effort has already yielded important anecdotal information for future weapon disassembly activity.

Los Alamos National Laboratory:

- Operations and controls at Technical Area 18 have been improved.

Lawrence Livermore National Laboratory:

- DOE agreed to maintain the ventilation system in the Plutonium Facility as a safety class system to prevent releases of radioactive material in an accident.

- DOE improved the packaging and storage conditions for programmatic nuclear materials.

- DOE reviewed the condition and status of vital safety systems.

Nevada Test Site:

- DOE continued to make improvements in the facilities and processes necessary to dispose of a damaged nuclear weapon.

- DOE reclassified as safety class the critical safety equipment used in G-tunnel for the handling of damaged nuclear weapons and improvised nuclear devices.

Sandia National Laboratories:

- The laboratory is strengthening the safety bases for nuclear operations.

NUCLEAR MATERIALS PROCESSING AND STABILIZATION

The Board's strategic performance goal for this area is to ensure that DOE's program for handling of hazardous nuclear materials and deactivation and decommissioning of unused facilities provides adequate protection of the health and safety of the workers and the public. The Board's safety oversight activities in this area focus on the stabilization and storage of nuclear materials, storage and disposition of defense nuclear waste, and deactivation and decommissioning of defense nuclear facilities.

As a result of the Board's efforts during 2004, DOE has taken actions to reduce or eliminate risk and improve safety. These actions include stabilizing and improving the storage conditions of nuclear materials, correcting deficiencies in the formal conduct of operations, improving the quality of engineered safety systems, and correcting deficiencies in the safety bases for new and ongoing activities.

Specific examples of safety improvements in materials processing and stabilization made in consequence of the Board's work are as follows.

Hanford Site:

- DOE completed the stabilization and packaging of several tons of plutonium metal and oxide to meet the long-term safe storage standard.

- Nearly all spent fuel has been removed from the K-Basins and packaged for eventual disposal; other safety improvements included enhanced conduct of operations for fuel container handling and hoisting and rigging operations.

- DOE reconsidered the safety and feasibility of a plan to employ divers in the highly-contaminated K-East Basin; further testing and evaluation will be conducted before proceeding with this plan.

- DOE conducted an Integrated Safety Management review at the tank farms following a series of safety incidents.

- The nuclear licensing strategy for a new project to treat transuranic mixed waste was reevaluated, and a formal safety analysis was started.

- In response to safety issues identified by the Board, DOE conducted tests to identify safe parameters for chemical decontamination of the Plutonium Finishing Plant at Hanford.

Waste Isolation Pilot Plant:

- Several new controls were added to the safety basis for mobile transuranic waste characterization units; an Operational Readiness Review will be conducted prior to operation.

Savannah River Site:

- Conversion of neptunium solutions to a stable oxide form commenced.

- Funding for the Salt Waste Processing Facility project was restored, and a program to accelerate waste stabilization and risk reduction is being pursued.

- Operations involving potentially explosive drums of transuranic waste were halted, and an investigation into this safety issue was started.

- DOE corrected deficiencies in the site's process to identify hazards and develop safety controls for decommissioning work.

Rocky Flats Environmental Technology Site:

- DOE took action to correct significant deficiencies in work planning, analysis and control of hazards, and fire response for decommissioning work.

Los Alamos National Laboratory:

- A comprehensive nuclear materials packaging and storage plan was developed that will reduce risk by accelerating the schedule for stabilization, packaging, and improved storage of nuclear materials.

Lawrence Livermore National Laboratory:

- In March 2004, DOE completed the stabilization and packing of material covered by Recommendation 94-1.

NUCLEAR FACILITIES DESIGN AND INFRASTRUCTURE

The Board's strategic performance goal for this area is to ensure that new defense nuclear facilities and major modifications to existing facilities are designed and constructed in a manner

providing adequate protection of the health and safety of the workers and the public. In recent years, there has been a substantial increase in the number of design and construction projects under the Board's jurisdiction. In addition to an increasing number of new projects, DOE has undertaken its largest project, the Waste Treatment Plant at the Hanford Site, using a "close-coupled" process in which design and construction occur simultaneously. As the design of each system or piece of equipment design is completed, construction commences.

Though this approach can be used successfully with suitable management safeguards, DOE's use of it at the Waste Treatment Plant has led to a series of quality problems, all during the initial stages of construction: (1) improper placement of structural concrete; (2) failure to maintain control over concrete mix materials; (3) improper rebar installation; and (4) failure to provide proper procurement specifications to fabricators of safety related equipment.

Specific examples of safety improvements in facilities design and infrastructure made in consequence of the Board's work are as follows.

Hanford Site:

- Potential safety flaws in the design of the Waste Treatment Plant were identified and corrected. For example, DOE (1) improved the quality of safety basis calculations, (2) strengthened the electrical design for managing emergency loads, (3) made more conservative the design basis for mitigation systems used to prevent hydrogen deflagrations and detonations, and (4) removed and repaired improperly placed concrete.

- DOE developed a better understanding of the Hanford site seismic ground motion. This resulted in an increase of more than 30 percent for the projected seismic loads on the Waste Treatment Plant. This change will require complete re-evaluation of the design.

Pantex Plant:

- DOE corrected the faulty design of the roof of Building 12-64; installation of the new design is underway.

NUCLEAR SAFETY PROGRAMS AND ANALYSIS

The Board's strategic performance goal for this area is to ensure that DOE develops, maintains, and implements regulations, contract requirements, guidance, and safety programs that ensure adequate protection of health and safety of the workers and the public. The Board's oversight activities in this area focus on generally applicable safety standards and on generic issues affecting a variety of defense nuclear facilities.

As a result of the Board's efforts during 2004, DOE has taken actions to strengthen the technical competence of its contractors, establish and implement safety standards, improve the quality of engineered systems, and increase the effectiveness of oversight and generic safety programs such as Integrated Safety Management.

Specific examples of improvements in nuclear safety programs and analysis made in consequence of the Board's work are as follows.

- The Board prevented DOE from improperly downgrading the existing safety class ventilation systems at the Lawrence Livermore National Laboratory, and later in the year, issued Recommendation 2004-2 specifying minimum safety requirements for such systems at all defense nuclear facilities.

- DOE is re-evaluating its fundamental policies for oversight of complex, high-hazard nuclear operations and is restructuring line management to more closely align with the attributes of a highly reliable organization. (Recommendation 2004-1)

- DOE issued a new standard entitled *Specific Administrative Controls* and developed a training program for site personnel to ensure the proper application of administrative controls. (Recommendation 2002-3)

- DOE issued guidance governing the safe use of "toolbox" codes, which are standard computer software packages meeting minimum quality assurance requirements for safety analysis. (Recommendation 2002-1)

- DOE revised and strengthened its *Federal Technical Capability Manual*, providing a sound basis for the more uniform implementation of safety system oversight throughout the complex. (Recommendation 2000-2)

OUTSTANDING SAFETY PROBLEMS OF DEFENSE NUCLEAR FACILITIES

Safe Retrieval, Handling, and Stabilization of Nuclear Materials

The Board continues to urge DOE to expedite the stabilization of materials in deteriorating storage conditions. Of greatest concern are the remaining sludges in the K-Basins at Hanford, high-level waste in degrading underground tanks at Hanford and Savannah River Site, and large quantities of nuclear materials at Los Alamos National Laboratory. New hazards are emerging as DOE increases its efforts to exhume and treat transuranic wastes that have been buried for as long as 40 years.

DOE continues to grapple with technological and programmatic difficulties. At the K-Basins Closure Project at Hanford, the Board uncovered programmatic breakdowns in engineering and project management that have substantially delayed efforts to retrieve sludge from the basins. The Board intends to maintain a high priority for the oversight of this effort.

DOE's plan to retrieve and treat high-level waste from underground storage tanks at Savannah River, Hanford and the Idaho National Engineering and Environmental Laboratory is subject to considerable uncertainty. The Board has focused its attention on technical and safety

challenges arising from DOE's attempts to implement first-of-a-kind technologies for retrieval, treatment, and disposal of high-level waste.

Significant quantities of nuclear materials remain unstabilized at Los Alamos. DOE did submit an acceptable implementation plan to meet the requirements of Recommendations 94-1 and 2000-1. However, a recent site-wide shutdown due to safety and security concerns has placed the new schedule for stabilization and risk reduction in jeopardy.

As DOE expands its efforts to retrieve and package transuranic wastes at many sites, particular caution will have to be taken to protect the public and workers, as this waste stream includes very old and sometimes poorly characterized waste containers. Although much progress has been made in the retrieval and disposal of well-characterized and low-activity transuranic waste, DOE must develop effective safety controls for the retrieval, handling, and repackaging of high-activity transuranic waste that still resides at many sites in the DOE complex.

Vigilance During Deactivation and Decommissioning

DOE has accelerated deactivation and decommissioning (D&D) work at a number of cleanup sites. While more rapid cleanup is a laudable goal, it should not be accomplished at the expense of safety. The Board has observed occasional breakdowns in safety management during the difficult transition from production operations to D&D. Production operations typically involve established operating procedures carried out by experienced workers, whereas D&D operations are often characterized by constantly changing tasks, evolving facility conditions, and operators new to D&D work. These difficulties are aggravated when DOE relaxes safety vigilance after bulk quantities of radioactive materials have been removed from the facility. Significant quantities of hazardous materials may remain as residues in operating equipment, process lines, and storage tanks. The temptation to view cleanup work at this stage as routine must be resisted.

Numerous incidents have occurred during D&D efforts at the Rocky Flats Environmental Technology Site and at Savannah River. As a result of the Board's investigations, DOE has taken effective corrective actions at these two sites. The startup of D&D activities at Hanford's Plutonium Finishing Plant was similarly accompanied by faulty procedures, weak training, and inadequate implementation of safety requirements. DOE was forced to halt the work.

The Board will continue to evaluate the safety of D&D operations at DOE's defense nuclear facilities, emphasizing the necessity of effective implementation of Integrated Safety Management throughout the life cycle of a facility. The perception that D&D work is a lower-hazard activity permitting a more relaxed attitude towards safety is fundamentally erroneous.

Technical Capacity and Highly Reliable Organizations

Information developed by the Columbia Accident Investigation Board with respect to the loss of the space shuttle, and by the U. S. Nuclear Regulatory Commission in connection with the "near miss" at the Davis-Besse nuclear power plant, suggests that a weakening of federal oversight of contractor operations can have dire consequences. Unfortunately, lessening of

federal oversight has been an objective of DOE's senior management. To examine the hazards of this course of action more fully, the Board completed a series of eight public meetings between September 2003 and March 2004. During the public meetings, the Board received testimony from representatives of the U.S. Nuclear Regulatory Commission, the Naval Reactors Program, the Columbia Accident Investigation Board, and DOE managers.

Based on its review in this area, the Board concluded that DOE's reduced-oversight initiatives could increase the possibility of a nuclear accident in the defense nuclear complex. In particular, the Board saw evidence of: (1) increased emphasis on productivity at the expense of safety; (2) loss of technical competence in DOE upper management; (3) insufficient safety research; and (4) inadequate central oversight of safety. To reset DOE's course of action, the Board issued Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*. The Recommendation is supported by a technical report entitled *Safety Management of Complex, High-Hazard Organizations.* The Secretary of Energy has accepted this Recommendation. Implementation of this recommendation presupposes that DOE will, under the Board's oversight, continue to strengthen its technical competency, support the facility representative program, and enforce safety requirements.

Adequacy of Design for New Defense Nuclear Facilities

One of the Board's statutory responsibilities is to ensure that adequate health and safety requirements are embedded in the design of new defense nuclear facilities and are properly implemented during construction. Moreover, needed safety controls must be identified early in the design phase to avoid unnecessary cost and delay during construction. Integrated Safety Management (ISM) provides the framework for the identification and application of safety requirements in design and construction. The Board expects that when DOE undertakes to build a new defense nuclear facility, which may need to operate for as much as 50 years, ISM principles and core functions will be used in all phases of the project.

DOE has underway design and construction projects with a projected total cost in excess of $13 billion. From the Board's perspective, however, DOE is continuing to struggle with establishing a conservative design from the beginning of the project. DOE is considering or planning to make use of design/build techniques for large-scale facilities, including some with incompletely-designed processes. This approach entails considerable risk when combined with DOE's shortage of competent personnel to manage such projects. The Board continues to expend extensive resources to ensure that designs for defense nuclear facilities incorporate multiple layers of safety controls commensurate with the hazards presented.

Reliable Operation of Safety Systems

The Board continues a strong interest in ensuring that DOE properly maintains safety systems at defense nuclear facilities. Many defense nuclear facilities were constructed decades ago. It is thus extremely important that protective features be maintained as serviceable and effective. For new facilities, on the other hand, the Board focuses its attention on ensuring that safety systems are correctly identified, designed, and constructed.

Unfortunately, the Board continues to identify weaknesses in programs critical to the continued reliable operation safety systems: maintenance, testing, surveillance, quality assurance, prevention of counterfeit parts, configuration management, training, and conduct of operations. DOE is working to make improvements in many of these areas in response to related recommendations from the Board such as 2000-2, 2002-1, 2004-1, and 2004-2. However, as DOE continues to extend the life of aging facilities, and budgets tighten, there is constant pressure to reduce the number of safety systems and to provide less effective maintenance. The Board will continue to stress to DOE the importance of ensuring the long-term reliability of vital safety systems and the infrastructure needed to maintain them.

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1. INTRODUCTION

1.1 BACKGROUND

The Defense Nuclear Facilities Safety Board (Board) is an independent federal agency established by Congress in 1989. Simply stated, the Board's mandate under the Atomic Energy Act is safety oversight of the civilian nuclear weapons facilities managed by the Department of Energy (DOE). The nuclear weapons program remains a complex and hazardous operation. DOE must maintain in readiness a nuclear arsenal, dismantle surplus weapons, dispose of excess radioactive materials, maintain aging facilities, clean up surplus facilities, and construct new facilities for many purposes. All of these functions must be carried out in a manner that protects the public, workers, and environment.

Congress established the Board as an independent agency to provide sound technical oversight of DOE's defense nuclear weapons facilities and operations. For that reason, Members of the Board are required by statute to be experts in the field of nuclear safety. The Board has, in turn, assembled a permanent staff with broad experience and competence in all major aspects of safety.

The Board has established site offices at six high-priority defense nuclear sites: Pantex Plant in Texas, Los Alamos National Laboratory in New Mexico, Y-12 National Security Complex in Tennessee, Savannah River Site in South Carolina, Hanford Reservation in Washington State, and Lawrence Livermore National Laboratory in California. The site offices provide the Board with a continuous presence at these locations. At other locations, the Board maintains safety oversight by means of regular onsite reviews by members of its technical staff.

During the Board's 15 years of operation, its priorities have evolved with changes in the nuclear weapons program. The Board uses its Strategic Plan, required by the Government Performance and Results Act, to ensure that its limited resources remain focused on the most significant health and safety challenges and keep pace with shifts in those challenges from year to year. The Board's health and safety activities are closely tied to goals and objectives embodied in this plan.

This Annual Report summarizes the Board's work during calendar year 2004. Sections 2, 3, 4, and 5 describe progress in the four major areas of the Board's operations: Nuclear Weapons Operations, Nuclear Materials Processing and Stabilization, Nuclear Facilities Design and Infrastructure, and Nuclear Safety Programs and Analysis. Section 6 addresses the Board's interactions with the public. Appendices A through F provide additional material: the *Federal Register* notices of the Board's 2004 recommendations (Appendix A), a table of all recommendations cited in this report (Appendix B), a list of reports requested from DOE (Appendix C), a list of the Board's letters (Appendix D), a summary of administrative and human resource activities (Appendix E), and a table of acronyms and abbreviations (Appendix F).

1.2 OVERSIGHT STRATEGY

Maintaining an effective safety oversight program that fulfills the broad mandates of the Board's enabling legislation requires continuing reassessment of health and safety conditions throughout DOE's defense nuclear complex. The Board concentrates its resources on the most hazardous operations and complex safety issues, guided by its strategic plan and the following principles:

- **Oversight Role** - As an oversight but not a regulatory agency, the Board uses a variety of statutory powers to ensure adequate protection of the public and worker health and safety. While the Board is empowered to identify current and potential safety problems and to recommend solutions, DOE remains responsible for taking actions based on the Board's insights.

- **Risk-based Oversight** - The Board's safety oversight activities are prioritized predominantly on the basis of risks to the public and the workers, types and quantities of nuclear and hazardous material at hand, and hazard of the operations involved.

- **Technical Competence** - The Board has endeavored since its inception to ensure that DOE obtain and maintain the high level of technical expertise essential to the management of nuclear activities.

- **Line Management** - Primary responsibility for safety resides in DOE and contractor management. Safety oversight can reinforce but not substitute for the commitment of line management and workers to safe work planning and performance.

- **Clear Expectations** - Effective safety management demands that safety expectations be clearly defined and tailored to specific hazards. Work instructions that are clear, succinct, and relevant to the work are more likely to be embraced by workers.

- **Effective Transition Planning** - The Board's safety oversight of defense nuclear facilities is coordinated with other federal agencies and with state governments to ensure a smooth transition from deactivation to environmental regulation.

The Board is provided by statute with a number of tools to carry out its mission. Among these are recommendations (typically broad and comprehensive in nature), reporting requirements (focused on specific safety issues), and public hearings (used to obtain information from DOE, other expert sources, and the public at large). Since 1989 when the Board began operations, it has issued 47 formal recommendations, comprising 218 individual sub-recommendations. In that same period of time, the Board has issued 146 reporting requirement letters. In 2004 alone, the Board issued 31 such letters to DOE.

1.3 STRATEGIC PLAN

The Board organizes its safety work by merging the broad health and safety mandate of its statute with the requirements of the Government Performance and Results Act. The Board's

Strategic Plan identifies the serious hazards of handling nuclear weapons and weapon materials, and disposing of aging and surplus facilities. These hazards include the following:

- Tons of radioactive and toxic materials throughout the defense nuclear complex, some stored in an unstable state.

- Aging facilities that require ever-increasing maintenance and surveillance to assure safety.

- The potential for accidental releases caused by inadequate safety controls, human errors, equipment malfunctions, chemical reactions, building fires, detonations, and criticality events.

- Natural phenomena such as wildfires, earthquakes, extreme winds, floods, and lightning.

Given these threats, safety can be assured only by the adoption of a conservative engineering philosophy that hinges on reliable systems and multiple layers of protection. This concept is called "defense in depth," and it has been a precept of nuclear safety in the United States for many decades. Defense in depth is especially important with respect to the handling of high explosives in proximity to radioactive material.

The Board's Strategic Plan sets forth four general goals:

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

- *Nuclear Materials Processing and Stabilization*: Processing, stabilizing, and disposing of hazardous nuclear materials are performed by DOE in a manner that ensures adequate protection of the health and safety of the workers and the public.

- *Nuclear Facilities Design and Infrastructure*: New defense nuclear facilities and major modifications to existing facilities are designed and constructed by DOE in a manner that ensures adequate protection of the health and safety of the workers and the public.

- *Nuclear Safety Programs and Analysis*: Regulations, requirements, guidance, and safety management programs adequate to protect public health and safety, including workers, are developed and implemented by DOE.

1.4 HUMAN CAPITAL MANAGEMENT

The ability of the Board to fulfill its mission depends heavily on attracting and retaining top-caliber, competent technical staff. The Board has been successful in creating a work environment that emphasizes excellence as the standard for staff performance, and rewards staff members accordingly. The pay banding and pay-for-performance programs developed and

implemented by the Board have proven to be effective in hiring technical talent, holding employees accountable for their performance, and rewarding outstanding performance on the job. This is evidenced by the low turnover rate, which was about two percent in 2004.

In 2004, the Board operated at 65 percent of its statutory employment ceiling of 150 Full Time Equivalents due to fiscal constraints. Within these constraints, however, the Board used its statutory excepted service hiring authority, along with recruitment and relocation bonuses, student loan repayments, and retention allowances, to hire and retain competent personnel. This approach has allowed the Board to remain successful in securing scientific and technical staff in a competitive employment market.

During the year 2004, the Board continued to require its engineers and scientists to maintain the highest level of technical knowledge to meet a wide range of health and safety challenges. Ninety-three percent of the senior technical staff holds advanced degrees, 23 percent of which are at the Ph.D. level. To meet future staffing needs, the Board continued its recruitment of senior, experienced technical staff. To attract recent graduates, the Board relies on its Professional Development Program, a 3-year program that brings entry-level technical talent into professional positions within the Board. The Board provides them a technical mentor, individually-tailored developmental assignments, post-graduate education, and a one-year, hands-on field assignment. This is a highly competitive program to attract the next generation of scientific and technical talent to federal service.

2. NUCLEAR WEAPONS OPERATIONS

2.1 SAFE CONDUCT OF STOCKPILE MANAGEMENT

Stockpile management is the term used to describe the industrial aspects of maintaining the nation's nuclear weapons stockpile. Examples of the Board's activities to improve health and safety in stockpile management are discussed in the following subsections.

2.1.1 Pantex Plant

The Pantex Plant, located near Amarillo, Texas, serves a central role in stockpile management. Operations at the site include assembly, disassembly, dismantlement, and surveillance of nuclear weapons, as well as interim storage of plutonium removed from retired weapons. In 2004, the Board sought health and safety improvements in weapons operations, tooling program implementation, facility safety systems, and electrical and lightning protection systems.

Nuclear Explosive Processes. The Board has encouraged DOE to accelerate safety improvements to nuclear explosive operations at the Pantex Plant (Recommendation 98-2). In FY 2004, DOE completed the start-up of an improved process for nuclear explosive operations on the W78 program. DOE has also continued development of enhanced processes for the B83, W87, W88, and B61 weapon programs. The prompt completion of re-engineering of the nuclear explosive processes for the remaining weapon programs will result in substantial safety improvements.

Safety Bases. The implementation plan for Recommendation 98-2 includes a commitment to improve safety bases at the Pantex Plant and to implement improved controls from the safety basis documents, particularly for on-site transportation. Pantex continues to enhance and strengthen its controls for nuclear explosive operations.

Quality Assurance for Tooling. In a letter to the National Nuclear Security Administration (NNSA) dated June 18, 2004, the Board expressed serious concern regarding the program to design, fabricate, and evaluate tools used during nuclear explosive operations. The Board noted that an effective quality assurance program is essential to safe design, fabrication, procurement, inspection, and maintenance of special tooling, and requested that NNSA conduct a comprehensive review of the tooling program at Pantex. NNSA undertook the review but was forced to suspend it in November 2004 due to the number and variety of adverse findings. In a December 15, 2004 letter to NNSA, the Board pointed out that a formal, causal analysis of deficiencies in the tooling program had not been performed prior to implementing corrective actions. The Board encouraged the Pantex Site Office and NNSA headquarters to assume some leadership in restoring the tooling program. The Board requested, and the Pantex Site Office provided, a report that described the impact of tooling program deficiencies on operational safety, the compensatory measures being taken while long-term corrections are being made, and the long-term path forward for improving the tooling program at Pantex.

Safe Storage of Nuclear Material. In response to the Board's Recommendation 99-1, DOE has repackaged more than 10,000 pits into robust containers suitable for interim storage. The associated container surveillance program has been rejuvenated, and the entire surveillance backlog was worked off during 2004.

Safety of Dismantlement Operations. In a January 20, 2004 letter, the Board identified a number of deficiencies that led to a failed dismantlement of a damaged device. As a result of this incident and the Board's letter, Pantex has made improvements in training production technicians, conducting unreviewed safety question evaluations, performing nuclear explosive safety evaluations, and requiring involvement of process engineers in certain types of operations.

B53 Dismantlement Operations. The Board identified a number of flaws in DOE's plans to dismantle the B53 weapon system. As a result, DOE has revised its plans and goals for the B53 system and has committed to pursue a more disciplined strategy that conforms to modern safety standards for nuclear explosives activities.

Leak Paths in Cells. As a result of the Board's inquiries, Pantex has taken additional actions to reduce the potential for off-site consequences due to an explosive release of plutonium. Pantex has initiated weld repairs to door gaps that were previously sealed with non-conforming caulking. Other repairs are being investigated, and the use of a knife-edge reduction factor in the calculated off-site dose is being revisited.

Electrical and Lightning Protection. DOE made progress in correcting deficiencies in electrical and lightning protection systems. Pantex has committed to installing safety improvements (surge suppression and cable replacement) suggested by the Board in Buildings 12-44 and 12-64.

2.1.2 Y-12 National Security Complex

Y-12 is a manufacturing facility located in Oak Ridge, Tennessee. Stockpile management activities at Y-12 include production, maintenance, refurbishment, dismantlement, evaluation, and storage of certain components of nuclear weapons. Production activities include manufacture or re-manufacture of unique nuclear weapon components. The Board's most recent efforts to improve safety at Y-12 concentrated on processing highly enriched uranium, criticality safety, nuclear material storage, and fire protection.

Fire Protection. In 2002, the Board challenged the adequacy of fire protection in the B-1 wing of Building 9212, a wet chemistry process area lacking a fixed fire suppression system. Throughout 2004, the Board pressed for progress on the issue. In July, DOE decided to install a fixed fire suppression system on the first floor, a new shutdown interlock for the process system, fire-protective coatings on certain structural supports, and modifications to divert combustible liquids to the first floor. DOE's contractor began design and planning for the upgrades, which should be completed by late FY 2005.

Oxide Conversion Facility. In a December 2003 letter, the Board identified safety issues attending the proposed startup of the Oxide Conversion Facility in Building 9212. These

issues included missing weld radiographs, lack of proper designation of certain safety equipment, failure to analyze a credible criticality scenario, and inadequate protection of worker safety. DOE re-radiographed significant welds, upgraded the functional classification of safety system equipment, added seismic reinforcement, added a safety interlock to address the criticality concerns, and addressed the worker safety concerns. During subsequent reviews, the Board brought to DOE's attention concerns regarding error handling for a programmable logic controller that operates shutdown systems important to safety. In response, DOE changed the control system to ensure that major logic controller errors were brought to the immediate attention of process operators.

Conduct of Operations. The Board has repeatedly stressed the need for formality of operations at Y-12, including strict adherence to procedures, reporting events and deficiencies, control of work, and dedicated oversight by management. By late 2003, a project execution plan had been developed to improve operations. Efforts to tighten adherence to procedures and to ensure proper reporting of events and deficiencies resulted in some improvements. The site also enacted a management observation program and chartered an independent group of oversight personnel to provide increased on-the-floor observations of nuclear operations and more intense mentoring of operations personnel.

Independent Validation of Safety Basis Controls. In July 2003, the Board highlighted the lack of a process to ensure implementation of new or revised safety basis controls. In response, DOE instituted independent validation protocols. Initial reviews conducted in 2004 revealed the need for several enhancements in the protocols and in personnel training.

Adequacy of Safety System Design. In October 2003, the Board questioned whether several fire suppression systems in Building 9212 met current standards. In response, DOE evaluated the differences between the code of record and current fire safety codes and documented the basis for acceptance of the systems. The Board is also aware that the Y-12 contractor led an effort under the auspices of the Energy Facility Contractor Group to develop guidance for the evaluation of designs. In August 2004, this group submitted a proposed guidance document to DOE headquarters.

Work Planning for Infrequent, Hazardous Operations. The Board identified weaknesses in the hazard analysis for a drum venting operation that led to inadequate definition of safety controls. This incident suggested that work planning for similar infrequent but hazardous operations might be deficient. In response, protocols were developed to ensure higher levels of review and approval of work planning for such evolutions. A successful trial application is being expanded for use by all major nuclear facilities at Y-12.

Standardization of Fissile Material Container Designs. In 2002, the Board directed DOE's attention to the need to simplify and standardize storage techniques for fissile materials. In September 2004, DOE developed a project execution plan that should result in a high level of standardization of enriched uranium containers.

Access to Nuclear Weapons Expertise. In an October 2004 letter to NNSA, the Board identified a lack of support for commitments made in response to Recommendation 93-6. These

commitments included a program of personnel interviews and archiving of documents. To remedy this situation, DOE restarted the Knowledge Preservation Program to identify key personnel, conduct interviews, and archive the information obtained.

2.2 SAFE CONDUCT OF STOCKPILE STEWARDSHIP

Stockpile stewardship is the term used by NNSA to refer to activities carried out in the absence of underground nuclear weapons testing to ensure confidence in the safety, security, and reliability of nuclear weapons in the stockpile. Stockpile stewardship includes using past nuclear test data in combination with future non-weapon test data and aggressive application of computer modeling, experimental facilities, and simulations. Safety aspects of activities at the major sites engaged in stockpile stewardship are discussed in the following subsections.

2.2.1 Recommendation 2002-2

Safe operations in the nuclear weapons complex depend directly upon the technical abilities of the scientists and engineers at the nuclear weapons laboratories. These individuals apply unique expertise to ensure the safety of weapons operations. The safety information generated at the laboratories is of little use, however, unless it is disseminated effectively to relevant sites. Clear lines of communication are vital to ensure that safety issues raised at any facility are properly routed to the laboratories for resolution, timely answers are developed, and critical information is then transmitted for use throughout the complex. In 2002, the Board issued Recommendation 2002-2 with these goals in mind. DOE now requires that each site office track and ensure closure of safety issues regarding nuclear weapons.

2.2.2 Los Alamos National Laboratory

Los Alamos National Laboratory, located in New Mexico, is the NNSA weapons laboratory with the largest number of defense nuclear facilities and weapon-related activities. In 2004, the Board focused its attention on conduct of engineering, work planning, safety bases, active ventilation systems, integrating safety into design, the Technical Area 18 Pajarito Laboratory, and the suspension and resumption of operations.

Conduct of Engineering. The Board, in a letter dated January 27, 2004, suggested that complex, high-hazard research, development, demonstration and testing would benefit from: (1) a structured application of engineering standards and practices; (2) a formal conceptual design phase, similar to that for large facility projects; and (3) design reviews following conceptual and final design. In response, DOE has included in the laboratory's Operational Efficiency project measures that should accomplish these goals. In the same letter, the Board asked the laboratory for an outline of how DOE Order 420.1A, *Facility Safety,* will be implemented. The Board has not yet received a reply to this part of the letter.

Safety Basis. In a letter dated May 27, 2004, the Board noted that NNSA has focused mainly on the safety basis for the facility with the highest predicted accident consequence and paid much less attention to other facilities and activities. For example, the safety basis for the Plutonium Facility was submitted to DOE in April 2002 but is still not approved. Although the

full disposition of the proposed safety basis for the Plutonium Facility remains to be completed, DOE has made some progress in reviewing safety bases for other laboratory facilities and activities.

Ventilation. The Board's review of the Documented Safety Analysis for the Plutonium Facility and for the proposed Chemistry and Metallurgy Research Replacement facility revealed that DOE had made analytical assumptions that were not adequately conservative with respect to the value of active ventilation during an accident. Because this was the latest of a series of such missteps by DOE at a number of sites, the Board issued Recommendation 2004-2 to achieve a broadly-applicable solution.

Operations in Technical Area 18. In a letter dated May 21, 2004, the Board observed that the unmitigated consequences for worst-case nuclear accidents at this facility are quite high and are fundamentally different from worst-case scenarios at other laboratory facilities. In Area 18, a sequence of operator errors could initiate an uncontrolled reactivity excursion leading to melting and partial vaporization of a plutonium core or sample. DOE relied on correct and rapid operator actions to avert this accident, but this approach is now being re-examined.

Suspension and Resumption of Operations. All nonessential activities at the laboratory were suspended on July 16, 2004, as a result of security and safety failures. Following an on-site visit, the Board (in a letter dated September 13) emphasized the need to closely monitor and appropriately adjust plant conditions to maintain safe and stable configuration during the stand-down. Most activities at the laboratory have now been resumed safely. To implement long-term corrective actions identified during the suspension, the laboratory has developed the Operational Efficiency project.

2.2.3 Lawrence Livermore National Laboratory

Lawrence Livermore National Laboratory, located 45 miles southeast of San Francisco, California, is a nuclear weapons research and development laboratory. It provides technical expertise to support stockpile stewardship and management, including consulting on the surveillance and dismantlement of nuclear weapons. Most defense nuclear activities are conducted in the Superblock complex, which includes the Building 332 Plutonium Facility and the Tritium Facility.

The Board significantly intensified oversight of this laboratory in 2004. Members of the Board conducted three site visits inquiring into integrated safety management, the safety basis and vital safety systems at the Superblock facility, deactivation of the Heavy Element Facility (Building 251), and packaging and storage of nuclear materials. The Board also decided to station a site representative at the laboratory.

Plutonium Facility Safety Basis. In an April 2004 letter, the Board outlined fundamental flaws in DOE's approach to safety basis development at this facility. In particular, the Board was concerned that DOE had relied on questionable calculations to eliminate the need for a safety-class ventilation system. In response, DOE commissioned an independent analysis

of these calculations and received a report agreeing with the Board. DOE then directed the laboratory to maintain the Plutonium Facility's ventilation system as a safety-class system.

Configuration Management. In a November 2004 letter to the Secretary of Energy, the Board expressed concern over the apparent lack of configuration management of vital safety systems at the laboratory. DOE responded on January 4, 2005, agreeing that prompt action needed to be taken to review the configuration and condition of all vital safety systems in the plutonium facility. DOE is also working to confirm the operability of vital safety systems in all other defense nuclear facilities at the laboratory.

Deactivation of Building 251. The deactivation of Building 251 involves the removal of nearly 300 items of radioactive material, some posing a significant risk of radiation exposure to workers and potential for release of contamination in the building. The project is being carried out on an accelerated schedule to achieve near-term risk reduction and thus avoid costly safety basis upgrades. A March 11, 2002, letter from the Board discussed the need for comprehensive planning to support the deactivation effort. By the end of 2004, the laboratory reduced the nuclear material inventory in the facility by more than 80 percent.

Recommendation 94-1. In March 2004, Lawrence Livermore completed the stabilization and packaging of material covered by Recommendation 94-1. The plutonium-containing materials are now stored in strong, welded containers that meet DOE's plutonium storage standard. The laboratory has identified additional material no longer needed for program activities and continues to characterize, stabilize, and package the inactive material using the same methods and equipment used in the Recommendation 94-1 campaign.

Nuclear Material Packaging and Storage. During a review by the Board's staff in November 2004, it became apparent that nuclear materials not covered by either Recommendation 94-1 or the inactive materials program are not stored in suitable containers. DOE has now directed the laboratory to evaluate this problem and make improvements as needed to ensure safe storage of these materials.

2.2.4 Nevada Test Site

The Nevada Test Site is located in southern Nevada, about 75 miles northwest of Las Vegas. Stockpile activities at the Test Site include test readiness preparations, disposition of damaged nuclear weapons, and subcritical experiments. Underground testing of nuclear weapons is no longer being conducted; however, the site is maintained in a state of readiness should national security requirements demand the resumption of underground testing. The Board seeks to ensure that if testing is resumed, it would be done safely. During 2004, the Board focused its attention on the Device Assembly Facility, test readiness posture, capability to dispose of a damaged nuclear weapon, subcritical experiments, and conduct of transuranic waste operations.

Device Assembly Facility. During 2004, the Board reviewed the implementation of the recently-approved safety basis, relocation of Technical Area 18 activities from Los Alamos to the Device Assembly Facility, start-up of a glovebox and downdraft table, and the training and qualification program. In a November 2004 letter, the Board noted that NNSA plans for a

significant increase in the scope and operational tempo of activities at the Device Assembly Facility. Current planning indicated that a number of these activities may be conducted simultaneously, an operational situation not considered in the design of the facility. In addition, the Board's staff had observed significant deficiencies in the facility's safety management programs and the physical infrastructure. Given these facts, the Board advised DOE to place increased emphasis on safety management programs at the Device Assembly Facility.

Underground Testing. In 2002, the Board had found weaknesses affecting NNSA's ability to conduct safely an underground nuclear weapons test. The number of personnel qualified to plan and conduct such tests was shrinking, there was no formal safety basis, and there was no rigorous process to assess safety. NNSA implemented a plan to prepare a safety basis, stem the loss of experts, improve the state of readiness of facilities and equipment, and develop a readiness review process commensurate with nuclear explosive operations. In 2004, the Board observed that NNSA had made improvements in personnel, facilities, equipment, training, and safety basis documents.

Damaged Weapons. The Board continued to press for a program and infrastructure to safely dispose of a damaged or improvised nuclear weapon. During 2004, the Board reviewed safety basis developments, infrastructure improvements, practices, procedures, and training. NNSA continued to make physical improvements to G-Tunnel and conducted training on the full scope of disposition activities. The Board provided feedback on the developing safety basis and pointed out that the conduct and formality of operations still needed significant improvement for nuclear explosive operations.

Subcritical Experiments. The Board reviewed DOE's assessments and readiness for subcritical experiments and found inadequate nuclear safety management programs, inadequate mechanisms for verifying readiness of subcritical experiments and test readiness, and inadequate commitment to improving the readiness review process for subcritical experiments and nuclear weapons testing. As a result, NNSA's Nevada Site Office improved the safety basis documents, developed a process to resolve Unreviewed Safety Questions, and committed to improving the implementation of controls and conduct of readiness reviews.

Safety Basis Reviews. The Board reviewed several of the safety bases for nuclear facilities and activities, including the Device Assembly Facility, U1a Complex and Subcritical Experiments, Radioactive Waste Management Complex, G-tunnel, and On-site Transportation. Although the safety bases are substantially improving, the Board identified deficiencies that should be corrected before commencing operations

Lightning Protection. In 2003, the Board advised DOE that improvements in lightning protection were needed at the Test Site. The Board's review in 2004 found that lightning protection controls and features were now included in the safety basis of several nuclear facilities.

Hoisting and Rigging. In a letter dated January 21, 2004, the Board advised DOE of deficiencies in hoisting and rigging, maintenance, and practices for nuclear explosive operations. As a result, DOE has designated as safety-class the critical safety equipment in G-tunnel used for

handling damaged nuclear weapons and improvised nuclear devices. Additional measures include redesigned controls for handling unvented drums of transuranic waste and a revitalized maintenance program for hoisting and lifting equipment.

Work Planning and Control. The Board reviewed integrated safety management, quality assurance, work planning, and worker protection for all NNSA organizations working at the Test Site. The Board's review revealed significant deficiencies in the integrated safety management and quality assurance programs of Los Alamos and Lawrence Livermore National Laboratories. In response to a letter to NNSA from the Board in May of 2004, the Nevada Site Office has performed an assessment of integrated safety management, focusing on activity-level work planning and control. In 2005, the Board will ensure that suitable corrective actions are taken.

2.2.5 Sandia National Laboratories

Sandia National Laboratories are located primarily in Albuquerque, New Mexico. Major defense nuclear facilities at Sandia, most of which are located at Technical Area V at the New Mexico site, include the Annular Core Research Reactor, Hot Cell Facility, Gamma Irradiation Facility, and Pulsed Reactor Facility.

In September 2004, the Board issued a letter questioning the adequacy of safety bases at Sandia. A subsequent self assessment performed by the Sandia Site Office revealed that the site did not have a currently approved safety basis for onsite transportation of hazard category 3 or higher materials. As an interim measure, the site office issued an authorization policy and imposed compensatory controls while an adequate safety basis could be developed. In addition, the site office commissioned an independent review of the safety bases for nuclear facilities, to be conducted in December 2004.

3. NUCLEAR MATERIALS PROCESSING AND STABILIZATION

3.1 STABILIZATION AND STORAGE OF REMNANT MATERIALS

3.1.1 Complex-Wide Program

Inactive Actinide Materials. The Board evaluated NNSA plans for managing non-programmatic actinide materials stored at several sites throughout the defense nuclear complex. The Board found that NNSA personnel have begun to define and execute adequately a strategy to characterize materials for storage or disposition, to identify which materials fall under this effort, and to analyze and upgrade, where appropriate, material packaging and storage facility conditions. The Board continues to evaluate the approaches taken by each NNSA site, as well as NNSA's programmatic direction.

Surveillance and Monitoring Program for Plutonium Storage. DOE's safety standard entitled *Stabilization, Packaging, and Storage of Plutonium-Bearing Materials* (DOE-STD-3013) establishes requirements for the long-term storage of plutonium metal and oxides, including a surveillance and monitoring program to verify safe storage parameters. The surveillance and monitoring program managed by DOE's Savannah River Operations Office was established to monitor the use of this standard. Unfortunately, DOE again under-funded essential supporting work performed at Los Alamos National Laboratory. At the urging of the Board, the Assistant Secretary for Environmental Management restored the funding for this program for FY 2004. The Board also reviewed the scientific and statistical methodology for surveillance of plutonium in storage and provided input that corrected overly optimistic assumptions regarding the validity of extrapolations.

3.1.2 Plutonium

Stabilization and Packaging of Plutonium Metal and Oxide. During 2004, several significant milestones were achieved in DOE's implementation of the Board's Recommendations 94-1 and 2000-1. Operators at the Hanford Plutonium Finishing Plant completed both stabilization and packaging of plutonium oxide materials to meet DOE-STD-3013 and repackaging of containers of plutonium metal to correct weld quality deficiencies. These materials are now in a condition suitable for extended safe storage at Hanford or for shipment and subsequent storage at another suitable site. Similarly, stabilization and packaging and disposition of plutonium materials at the Lawrence Livermore and Oak Ridge National Laboratories were completed as promised in DOE's implementation plans for the Board's recommendations.

Nuclear Material Stabilization and Storage. The Board has continued to evaluate NNSA's plans for repackaging high-risk materials at Los Alamos National Laboratory into robust containers. In light of continued slow progress, the Board issued a letter to the Secretary of Energy in February 2004 urging the pursuit of alternative approaches that could accelerate this work. In response, DOE has developed a comprehensive plan that will accelerate the schedule for stabilization, packaging, and improved storage of nuclear materials. Progress was delayed by

the safety and security stand-down at Los Alamos, but program managers believe the schedule can be recovered in 2005.

Plutonium-238 Repackaging at Oak Ridge National Laboratory. The Board evaluated DOE's plan for repackaging nine items containing approximately 700 grams of plutonium-238 into special-form capsules for safer storage. Based on the Board's findings, DOE made several changes to improve the safety of the repackaging operations for three items that had suspect seals on the inner container. Changes included requiring respiratory protection during all work in gloveboxes and conducting the entire operation in the ventilated glovebox room.

Drums Containing Plutonium-238 at Hanford. In 2003, the contractor at the Hanford Site began work to retrieve more than 38,000 transuranic waste containers from burial trenches on site. Within these trenches are 12 drums containing between 44 and 100 grams of plutonium-238 per drum that will require special handling to ensure safety. In 2004, the Board continued to urge DOE to develop an adequate disposition plan. As a result of the Board's efforts, DOE has narrowed the options for disposition of this plutonium-238 material and has identified the programmatic hurdles that must be addressed. The preferred alternative is to ship the drums to Savannah River for dissolution in H-Canyon and disposition via the high-level waste system.

Hanford Plutonium Finishing Plant. Previously, the Board identified electrical deficiencies at this facility. Specifically, baseline short circuit calculations, which are used to confirm the adequacy of installed electrical equipment, were not consistent with the electrical configuration drawings. During 2004, DOE evaluated this situation and concluded that many of the electrical system protective devices in the facility have been applied above their rated capability. This is an unsafe condition and a violation of the National Electrical Code. Equipment upgrades have been made to correct the deficiencies.

3.1.3 Uranium

Denitrator Product Repackaging. Operators at the Idaho Nuclear Technology Engineering Center completed repackaging of 311 drums of highly enriched uranium oxide product in September 2004. The highly enriched uranium denitrator product was generated from the reprocessing of naval reactor fuel. It is being shipped to Savannah River and to Nuclear Fuel Services in Tennessee for blending into lower enrichment fuel for use in commercial reactors. Procedural compliance, communications, on the job training, and formality of operations were excellent.

Uranium-233 Disposition at Oak Ridge National Laboratory. The Board began its review of the design of the uranium-233 Disposition and Medical Isotope Production project at the laboratory. This project includes extraction of thorium-229 for medical use and downblending of the remaining material for packaging and disposition. The Board identified the potential for ion exchange resin safety issues similar to those previously identified by the Board at other defense nuclear facilities. The design contractor is using this information in developing resin safety controls for the project's design.

3.1.4 Neptunium

Solution Stabilization at the Savannah River Site. The Board reviewed the authorization basis and startup activities for stabilization of neptunium solutions at the HB-Line facility at the Savannah River Site. The neptunium flowsheet is very similar to previous plutonium operations, and no significant safety-related upgrades were necessary. Issues identified during the readiness assessment were resolved, and neptunium operations successfully began in early August 2004. This is the last major stabilization activity to be commenced at the Savannah River Site under Recommendations 94-1 and 2000-1.

Oxide Storage at the Idaho National Engineering and Environmental Laboratory. The Board began reviewing preparations for storage of neptunium oxide in the Fuel Manufacturing Facility. This material will provide future feed to support the production of plutonium-238 for use in radioisotope power systems. A review of the adequacy of the storage configuration and surveillance program is ongoing. In response to the Board's inquiries, the contractor procured a more robust cart to improve worker protection during transfer of containers within the storage facility.

3.2 STABILIZATION OF SPENT NUCLEAR FUEL

3.2.1 Hanford Site

The Board continued to provide close oversight of spent nuclear fuel removal activities at the Hanford Site. As the contractor neared completion of the removal of fuel from the K-East and K-West Basins, more resources were made available to begin removing sludge from the K-East Basin. However, the latter activity had suffered significant delays due to deficiencies in project management, design, and engineering; these deficiencies ultimately led to the failure of the contractor's Operational Readiness Review in 2003.

In a letter dated March 3, 2004, the Board called DOE's attention to the lack of effective corrective actions. Noting that the sludge project was again falling behind schedule, the Board requested that DOE provide a revised implementation plan for Recommendations 94-1 and 2000-1. This plan was to contain a defined disposition path for each sludge type within the K-Basins and realistic, firm milestones for commitments. DOE issued a revised implementation plan on May 3, 2004. The contractor began the transfer of low-activity sludge to a storage and shipping container in the K-East Basin in June 2004. In October 2004, operators began the consolidation of high-activity sludge into new containers placed at the bottom of the K-East Basin.

Subsequent reviews of this project by the Board revealed slow progress on the part of the contractor to correct deficiencies in the design and engineering process. Several subsystems within the sludge project required redesign or experienced delays due to inadequate design specifications, testing inadequacies, and equipment failures. The Board relayed these concerns to DOE which responded by formulating plans for independent reviews of design and engineering processes within the sludge project.

In October, contractor operators completed the milestone for removal of spent fuel from the K-Basins, one of the major objectives of Recommendations 94-1 and 2000-1. A storage container partially filled with scrap pieces remains; additional small quantities will likely be found during the removal of sludge from the basins. The required fuel handling, shipping, and treatment equipment will remain operational until all remaining fuel and scrap pieces are retrieved and processed.

The Board noted further discrepancies in spent fuel recovery operations, particularly in the areas of hoisting and rigging safety, multi-canister overpack handling, and plans for employing divers in the basin. Because of these inquiries, DOE performed an independent assessment of hoisting and rigging operations, took actions to improve the conduct of operations for canister handling, and reconsidered the safety implications of the proposal to use divers in the highly-contaminated K-East Basin.

3.2.2 Idaho National Engineering and Environmental Laboratory

All spent nuclear fuel previously in wet storage at the Idaho National Engineering and Environmental Laboratory has been consolidated at the Idaho Nuclear Technology Engineering Center. This includes accident debris from the Three Mile Island Unit 2 nuclear plant, fuel from the Power Burst Facility, and residual material from the Materials Test Reactor fuel basin. In addition, all fuel from the CPP-603 basin has been transferred to CPP-666, a state-of-the-art lined basin, and seven dry fuel storage casks loaded with spent fuel have been transferred from Test Area North to the Engineering Center for consolidation.

3.3 WASTE MANAGEMENT

3.3.1 High-Level Waste

Hanford Tank Farms

Worker Safety. The Board reviewed a series of occurrences, incidents, near misses, and other operational events indicating serious weaknesses in work planning, conduct of operations, and responses to abnormal events or unexpected conditions. The Board concluded that these problems were the result of deficiencies in the Integrated Safety Management system for work in the tank farms, particularly in the areas of work planning, conduct of operations, and feedback and improvement. The Board issued a letter on September 8, 2004, requesting that DOE provide a report on the weaknesses in integrated safety management at the tank farms and on corrective actions to improve worker safety. In response, DOE conducted the first phase of a two-part improvement validation review at the tank farms and committed to perform the second phase in early 2005.

Contact-Handled Transuranic Mixed Waste Treatment, Packaging, and Storage Facility. The Board challenged DOE's position that a Preliminary Documented Safety Analysis was not required by the Nuclear Safety Rule (10 CFR Part 830) because this facility was neither new nor a major modification. As a result, DOE reevaluated the licensing strategy for the project, determined that it should be identified as a new nuclear facility, and directed the tank

farms contractor to develop a Preliminary Documented Safety Analysis. This change is expected to better integrate the safety analysis with the overall design.

Safety Classification of Waste Transfer Valves. The Board discovered that these valves had not been given a correct safety classification and hence were not being adequately tested. In response, DOE directed its contractor to classify waste transfer valves that provide double-valve isolation as safety significant. Improvements that are expected include valve performance testing and, where valve testing is not possible, additional measures to protect workers. In a related matter, the Board noted that radiation surveys were not going to be preformed downstream of the isolation valve despite the expectation stated in the authorization basis. DOE responded by improving radiation survey plans for some transfers and strengthening radiological control procedures for general transfers.

Tank Integrity. A letter issued by the Board in August 2000 led to increased efforts by DOE to protect the integrity of the high-level waste storage tanks. This year, the Board provided input to a panel of nationally-recognized corrosion experts convened at Hanford to review the tank corrosion control program. The panel reported that:

> . . . due to the paucity and fragmentary nature of the available relevant DST [double-shell tank] corrosion data, it is not currently possible to provide a clear technical basis for DST waste chemistry controls, optimum DST waste chemistry specifications or a series of DST waste chemistry control options.

As a result, DOE has initiated an experimental program to characterize tank corrosion in high-level waste environments. In response to the Board, the panel reviewed the validity of characterizing corrosion of an entire tank based on ultrasonic inspection of only a small fraction of the tank surface and suggested a more in-depth statistical analysis of the data to support predicting general corrosion and pitting rates. The panel also suggested that in addition to structural integrity (i.e., preventing catastrophic failure), the leak integrity of the tanks should be studied in more detail.

The Board is continuing to evaluate tank integrity programs at Hanford. In particular, the Board is assessing the safety impact of DOE's decision allowing a double-shell tank to remain outside the corrosion control specifications.

Savannah River

Salt Waste Processing Facility. The Board evaluated the safety risks associated with delays in the design and construction of the Salt Waste Processing Facility and urged DOE not to eliminate funding for this important work. DOE has since restored funding for this project and is currently pursuing a program plan that will accelerate waste stabilization and risk reduction. The Board reviewed design documentation and identified weaknesses in the performance categorization and potential seismic interactions of various portions of the facility. DOE plans to upgrade certain structural components to ensure that unqualified components do not damage qualified components during an earthquake, and perform further analysis of the facility performance categorization.

High-Level Waste Facilities. In August 2004, the Board found that the majority of the safety-class electrical breakers and disconnects for the high-level waste facilities are installed in non-safety-rated buildings. As a result, although the documented safety analysis takes credit for the safety-class electrical breakers and disconnects, there is no assurance that these breakers can be relied upon to perform a safety function during a seismic event. DOE has identified an upgrade project to eliminate this vulnerability, but it is not certain this project will be funded in the near future.

3.3.2 Low-Level Waste and Transuranic Waste

Drum Handling at Savannah River. During a review of transuranic waste retrieval operations at Savannah River Site, the Board's staff called DOE's attention to the hazards of unvented transuranic waste drums. Experience at other DOE sites has shown that such drums can contain flammable and explosive mixtures of hydrogen and oxygen gas, thus requiring controls to protect workers. DOE's contractor disagreed, arguing that there was no evidence of flammable or explosive gas mixtures in drums handled so far. Shortly afterwards, however, a DOE facility representative observed a transuranic waste drum venting operation and discovered that the drum contained 16.4 percent hydrogen and 13.8 percent oxygen, a flammable mixture. This situation led to the declaration of a potential inadequacy in the safety analysis and the issuance of an occurrence report. In a subsequent review of records for previously vented drums, contractor personnel identified 73 drums that had contained flammable or explosive mixtures of hydrogen and oxygen prior to venting.

On December 14, 2004, the Board transmitted a letter alerting DOE to the contractor's apparent lack of knowledge of the hazards presented by the transuranic drums. DOE halted operations related to drum retrieval until all hazards could be clearly identified, analyzed, and controlled.

Waste Isolation Pilot Plant. The Waste Isolation Pilot Plant in New Mexico, commonly known as WIPP, is a geologic repository utilized for the disposal of defense transuranic wastes. WIPP received its first waste shipment on March 25, 1999. During 2004, the site received and deposited in the underground repository approximately 1,000 shipments totaling in excess of 8,500 cubic meters of contact-handled transuranic waste. The Board closely monitored operations because the facility operated at nearly full production during a time of significant turnover in DOE and contractor personnel. Following an accident that nearly caused a fatality in the underground portion of the plant, the Board strongly encouraged DOE managers to reassess the safety of operations.

National Transuranic Waste Program. The Board observed increasing weaknesses in the functioning of the National Transuranic Waste Program, which controls all of DOE's transuranic waste disposal projects. The Board encouraged DOE to improve cooperation and communications between WIPP and various waste storage and waste generator sites. Efforts to properly characterize and prepare waste for shipment to WIPP have been failing at both the Los Alamos and Idaho National Engineering and Environmental Laboratory. In a related incident, inadequate communication and cooperation contributed to radiological exposures to workers

operating a mobile waste characterization unit at the Lawrence Livermore National Laboratory. The Board expects to review transuranic waste operations in 2005 and beyond.

Mobile Transuranic Waste Characterization Units. The Board reviewed the DOE-authored Basis for Interim Operation for the operation of mobile transuranic waste characterization units. The Board discovered inadequacies in quantities of material at risk, analysis of deflagrations, and in controls specified in the technical safety requirements. In response to a letter from the Board, DOE agreed to add several new controls, including a formal container inspection program and lid restraints for unvented drums. DOE plans an operational readiness review for new deployments to ensure sites receiving the units are ready to operate them safely.

Advanced Mixed-Waste Treatment Project. The Board provided technical oversight of a review of the confinement ventilation system for the Advanced Mixed Waste Treatment Project at the Idaho National Engineering and Environmental Laboratory. In response to the findings of this review, DOE committed to make improvements to the surveillance and maintenance requirements for this vital safety system. The project has also been plagued by software problems which must be resolved before waste may be shipped offsite. Retrieval of transuranic waste containers from beneath an earthen berm was underway in the first half of 2004, governed by strict worker protection rules to avoid inhalation of plutonium. This project is currently on hold until problems with recordkeeping are resolved.

Melton Valley Waste Treatment Project. The Melton Valley Waste Treatment Project at Oak Ridge is designed to process liquid and solid transuranic waste and low-level radioactive waste for offsite disposal. The Board observed DOE's operational readiness review in January 2004 in preparation for solidifying high-activity, low-level liquid wastes. The Board noted weaknesses in conduct of operations during a replacement of a ventilation system filter. Problems included a failure to reference the procedure during the course of the activity, lack of supervision, and a radiological control technician performing tasks outside his area of responsibility. DOE management ensured that corrective measures were taken prior to startup. Liquid processing operations began later in January and were successfully completed in October 2004.

3.4 FACILITY DEACTIVATION AND DECOMMISSIONING

3.4.1 Overview

Accelerated deactivation and decommissioning (D&D) activities are occurring at more and more DOE sites as a result of DOE's accelerated cleanup initiative. Successful D&D work has reduced or eliminated hazards at a number of defense nuclear facilities, but the Board has observed difficulties in maintaining a high standard for work planning and safe work execution in several facilities that are making the transition from production operations to D&D. Production operations typically involve established operating procedures carried out by experienced workers. The shift to D&D involves constantly changing tasks and facility conditions. Work may be carried out by operators lacking significant experience in such operations. Making this transition is a large effort that is generally not complete before D&D

operations begin. This problem has been aggravated by a tendency of DOE and its contractors, particularly at the level of the first line supervisor, to view D&D work as routine and to relax safety vigilance once bulk quantities of radioactive materials have been removed. The perception that work control procedures need to be "streamlined" for greater efficiency has contributed to the observed problems.

3.4.2 Fernald Closure Project

Work at DOE's Fernald site, currently known as the Fernald Closure Project, involves an accelerated effort to decontaminate and demolish structures, remove and dispose of nuclear waste, and complete environmental remediation of the site by the end of FY 2006. In 2002 and 2003, the Board observed that the number of reportable occurrences and near misses at Fernald was on the rise and, in August 2003, sent a letter to DOE documenting these and other worker safety issues. More recent evaluations conducted by the Board in 2004 indicate that worker safety across the Fernald site has improved and that DOE has strengthened its oversight of contractor work.

During 2004, the Board reviewed hazard categorization, safety analysis methodology, and readiness review plans for removal of uranium waste products in Silos 1, 2, and 3. The Board concluded that the resulting safety controls and startup review plans were acceptable. The Board then observed the readiness reviews performed by the contractor and by DOE for these activities. The Board found that the readiness review teams were qualified and conducted thorough reviews, and that safe operations could begin after pre-start findings were addressed. (The Board did observe, however, that the contractor had prematurely commenced the readiness review.) The Board is pressing DOE and the contractor to make sure facilities are ready to operate before commencing future readiness reviews.

3.4.3 Miamisburg Closure Project

Activities at the Mound site, currently known as the Miamisburg Closure Project, include cleanout and demolition of buildings formerly used for nuclear materials and explosives research; development, testing, and production activities; removal of contaminated equipment and soil from the site; and environmental restoration. Nine buildings are being transferred to the Miamisburg Mound Community Improvement Corporation, which will operate the site as a high technology industrial park after DOE's cleanup activities are completed. The scheduled completion date is March 31, 2006.

In 2003, DOE took action to correct weaknesses identified by the Board, such as insufficiently detailed work procedures, and established a team of project managers, safety personnel, and radiological protection personnel to review all work procedures before they are approved for use. Reviews by the Board in 2004 indicate that the contractor is providing adequate safety oversight of work activities. There have been relatively few reportable occurrences or injuries to workers.

In late 2004, the Board began a review of the internal dosimetry program for bioassay analyses; this review will be completed in early 2005.

3.4.4 Rocky Flats Environmental Technology Site

D&D activities are continuing at the Rocky Flats Environmental Technology Site and are on schedule for completion by the end of FY 2006. During 2003, however, a number of significant safety incidents occurred, including a fire in a highly contaminated glovebox. On December 2, 2003, the Board issued a report to DOE pointing out a serious weakness in DOE's oversight of its contractor. The Board also identified the need for an independent review of the contractor's integrated safety management program. In January 2004, a review team coordinated by an outside consultant conducted this review on DOE's behalf and found that implementation of integrated safety management was not effective in integrated work control, fire response, and assessments of safety management programs.

On May 4, 2004, the Secretary of Energy transmitted to the Board the final corrective action plan; this plan was found by the Board to be adequate. Corrective actions included restricting the use of generic work packages to simple tasks, instituting more comprehensive review of work packages, improving procedures for chemical decontamination and control of combustible materials, retraining workers on the proper response to fires, and improving daily briefings to better communicate hazards and controls to the workers. To confirm that DOE carried out its plan, the Board visited the site several times in 2004. Lessons learned from the problems experienced at Rocky Flats have been shared with other DOE sites performing D&D work.

3.4.5 Savannah River Site

DOE issued a major contract modification in June 2003 to accomplish D&D of 252 buildings at Savannah River by the end of FY 2006. The contract modification incorporated an accelerated schedule with performance incentives for meeting goals. Much of the work so far has occurred without incident; however, the Board noted several events resulting from significant lapses in work planning and control. In one event, radioactive material was released when a supervisor authorized a subcontractor performing asbestos removal work to cut out and remove tritium-contaminated piping with no precautions for contamination control. In another event, workers were exposed to an unshielded cesium-137 source when a work crew cut open the shielded container.

The Board provided technical oversight to ensure that suitable corrective actions were being taken. In a review of work planning and control of D&D work in August 2004, the Board found deficiencies in defining the scope of work and the identification of hazards. In October 2004, DOE acknowledged these deficiencies and requested that its contractor take additional corrective actions. In December 2004, the Board issued a letter detailing the areas for improvement in work planning.

3.4.6 Hanford Plutonium Finishing Plant

DOE plans to demolish this facility by 2009, leaving only a slab on grade. The Board reviewed D&D activities in late 2004 and found that two important elements of work package preparation—hazard analyses and identification of controls—were confusing and difficult to

follow. Moreover, firefighting guidance provided to operators did not adequately cover the hazards of D&D work. Finally, the Board noted a downward trend in management attention to criticality hazards, despite the large quantity of fissile material remaining. Two serious errors in estimating plutonium mass occurred during 2004. The Board also evaluated a test program to characterize the reactivity of materials used in decontaminating gloveboxes. These experiments found that cellulose rags exposed to decontamination chemicals continued to undergo exothermic reactions even after chemical neutralization. This condition would present a hazard during storage and disposal of these materials. The Board is pursuing improvements in operations and safety attitudes at this facility.

3.4.7 Hanford K-East Basin

D&D began in September 2004 with the grouting of the K-East Basin discharge chute, and is scheduled to be complete by September 2006. Additional D&D work will be limited until the sludge is removed from the basin. After the sludge is removed, the contractor plans to prepare the K-East Basin to be cut into sections for disposal at the low-level waste facility at the Hanford Site. Highly radioactive components on the basin floor will be removed, and the remaining components and debris will be encased in a 6-foot thick layer of grout. Surface contamination on the basin walls will be reduced using hydrolasing. Six-foot wide strips on the basin floor, along the proposed cut lines, will also be hydrolased. Prior review by the Board had indicated that the contractor's concept for lifting the cut sections of the basin could lead to sections fracturing and falling. DOE now plans to provide support underneath the cut sections during lifting, which should eliminate the failure mode identified by the Board. The Board reviewed this project in October 2004 and found no new safety problems.

3.4.8 Lawrence Livermore National Laboratory

There are 49 gloveboxes and enclosures with a wide range of elemental and isotopic contamination to be decontaminated and decommissioned at the Heavy Element Facility. In general, this work requires removal of equipment from the gloveboxes, followed by decontamination of the internal surfaces to low-level waste limits to allow disposal at the Nevada Test Site. The Board has reviewed the readiness assessments for this work and passed along experiences from the Rocky Flats Environmental Technology Site.

3.4.9 Idaho National Engineering and Environmental Laboratory

The laboratory began an aggressive D&D program in 2004 to demolish unused facilities. The Board has been monitoring this work for indications of safety problems. While operational events have occurred, the Board has not identified significant adverse trends.

4. NUCLEAR FACILITIES DESIGN AND INFRASTRUCTURE

4.1 NUCLEAR FACILITY DESIGN REVIEWS

The Board is required by statute to review the design and construction of defense nuclear facilities, which must be designed and constructed in a manner that will support safe and efficient operations for 20 to 50 years. This demands an exacting design process, guided by ISM principles, that will ensure appropriate safety controls are identified early in the design. The Board's expectation is that the design and construction phases of defense nuclear facilities will demonstrate clear and deliberate use of ISM principles and core functions, and development of ISM-based manuals of practice to be followed throughout design and construction.

4.1.1 Hanford

Waste Treatment Plant

The Waste Treatment Plant is a multi-facility complex designed to treat Hanford's high-level radioactive liquid wastes. It consists of three primary nuclear facilities known as Pretreatment, Low-Activity Waste, and High-Level Waste. The Pretreatment facility receives high-level waste from Hanford's tank farms and separates it into high and low activity streams. The low activity portion will be transferred to the Low-Activity Waste facility where it is mixed with glass-forming materials and converted to a stable borosilicate glass, or "vitrified." The glass canisters from the Low-Activity Waste facility are subsequently placed in an onsite, near-surface facility. The high-activity waste stream is transferred from the Pretreatment facility to the High-Level Waste facility where it is also vitrified. After vitrification, high-level waste glass logs are temporarily stored at the Hanford site in the Canister Storage Building until shipment to DOE's high-level waste repository.

DOE has reported to the Board that the Waste Treatment Plant as a whole is 43 percent complete; engineering is 76 percent complete; procurement 72 percent complete; and construction 36 percent complete. Construction progress varies among the facilities. Currently, the Low-Activity Waste facility is furthest along—most of the structural concrete has been placed and considerable progress has been made in erection of the structural steel. Progress on the Pretreatment facility includes completion of the concrete walls and floors of the major below-grade and nuclear process areas. Many of the large process vessels are already in the facility. For the High-Level Waste facility, construction below grade is complete, and work on the above-grade concrete structure has commenced. Fabrication of modular piping systems is currently underway and much of the mechanical equipment is in the final stages of design or procurement. However, very few of the mechanical and electrical systems have been installed.

The Waste Treatment Plant project is being designed and constructed in a close-coupled or "fast track" fashion. This method is characterized by conducting design and construction activities simultaneously. For example, initial construction of the High-Level Waste facility (basemat and walls to grade) was initiated prior to approval of the structural design immediately above grade. The design-construct process has been used successfully in the past, but is best suited to simple structures and processes that have minimal technical risk.

The Waste Treatment Plant is not a simple structure, and many of the processes employed in this design are unique or have never before been used before in the DOE complex. Not unexpectedly, then, the project has encountered significant quality problems. Among these have been: (1) failure to develop proper controls for placement of concrete during extreme climatic conditions; (2) failure to maintain quality control over concrete mix materials; (3) failure to install the correct rebar per design; (4) use of incorrect weld rod material; and (5) failure to provide tank fabricators with the proper specifications for testing weld adequacy. This last problem led to the discovery of poor weld quality in a safety related vessel that had already been installed. DOE has corrected each of these problems and has taken steps to ensure that they will not recur. Notwithstanding these corrective actions, projects of this scope require continuous, intense vigilance by management.

The Waste Treatment Plant project has entered its most critical period. Construction has progressed beyond the point where simple changes to the design or structure are feasible if safety problems should arise. Major changes in the design of any major nuclear system would significantly impact the project's cost and schedule. This uneasy situation can cause reluctance to admit safety concerns, in part because the design and construction contract incentivizes minimization of costs and maintenance of schedule. For example, the Board's experienced great difficulty in overcoming DOE's reluctance to investigate problems with the seismic design. When DOE finally undertook careful study of the Board's concerns, it agreed that the initial seismic design specifications were incorrect. Altering the seismic design of the project at this late date will require DOE to evaluate the entire Waste Treatment Plant design, possibly leading to changes in existing equipment and in the design of piping designs. Fortunately, this issue is being addressed by DOE while design solutions still exist.

Structural Design. The Board's structural review focused on the Low Activity Waste Vitrification facility, the Pre-Treatment facility, and the High Level Waste Vitrification facility. Due to the complexity of the High Level Waste building, the Board requested that DOE prepare summary structural reports to ensure that the analysis results validate the adequacy of the design. These summary analyses explain the predicted behavior of the building and the resulting load-resisting mechanisms by examining structural deformation plots and interpreting building response, using fundamental principles of structural mechanics.

On April 15, 2004, DOE released the first draft of the summary structural reports for the High Level Waste facility. The report addressed some but not all of the Board's concerns; it did not adequately cover overall design margin, seismic load path distribution in the east-west direction, effects of concrete cracking, and finite element mesh refinement. The next revision of the report to be completed by the end of January 2005 is expected to cover these topics.

DOE issued the final version of its summary structural report for the Low Activity Waste facility on August 2, 2004. The Board, in its letter of August 24, acknowledged that this report satisfied the requirements of the original request. The Board also complimented the Office of River Protection's Peer Review Team, a group of structural experts empaneled to review the design of the Waste Tank Project's buildings. The Board noted that the team's rigorous reviews resulted in significant design improvements to the Low Activity Waste building.

Fire Protection. The Board discovered that the project planned to eliminate most of the fire protective coating for structural steel. In letters sent to DOE in March and July of 2004, the Board pointed out that this action was inconsistent with DOE requirements and industry practice and constituted a significant safety issue. DOE subsequently directed the contractor to provide structural steel fire resistance coatings in accordance with required codes and standards. Fire proofing is now underway, significantly improving fire resistance.

Safety Basis and Hydrogen Gas Hazards. In March 2004, the Board completed a review of the research and development to address mitigation of hydrogen hazards related to mixing non-Newtonian waste. These reviews focused on the theoretical basis for testing, experimental design, and analysis of results. Overall, the results of this research program demonstrated that a safety basis exists for mixing individual non-Newtonian tanks. The Board noted that the use of preliminary test data, which had not undergone a thorough quality review, would not be completed until months after major design decisions were to be made. DOE acknowledged the problem and directed its contractor, Bechtel National Incorporated, to take actions as suggested by the Board. Bechtel completed a summary level report forming the basis for some of the critical decisions necessary to support continued design. During the remainder of 2004, Bechtel continued to develop the mixing design for non-Newtonian wastes and will likely complete final testing and data analysis in 2005. This will form the basis for final design decisions.

Electrical System Design. The Board discovered that several safety-significant loads were connected to safety-class buses, contrary to established industry standards. Bechtel has since removed these loads to a separate safety-significant bus. The Board also noted that the fire-protection system designed to protect switchgear in the electrical substation had been intentionally disabled because of concern that the sprinkler water might enter the equipment (which is vented at the top). The system has been redesigned and returned to operation, but switchgear has not yet been covered to prevent water intrusion and consequent equipment damage following sprinkler activation. Efforts are underway to correct this remaining deficiency.

Earthquake Ground Motion

The Board has reviewed a number of specific technical issues that require resolution as part of assessing and updating the earthquake ground motion at the Hanford site. These issues involve developing an improved understanding of how the near-surface soils and bedrock affect the assessment of ground motion given the potential occurrence of an earthquake. Currently, DOE assumes that the assessment of earthquake ground motion can be based on California earthquake ground motion models. The basis for this assumption has been questioned in part because the properties of near-surface soils and bedrock at Hanford are not the same as California's. This source of error is compounded by the paucity of direct data for the physical properties of Hanford soils and bedrock, critical to completing ground motion estimates. Finally, the bedrock at Hanford is not a continuous unit, having alternating layers of harder basalt and softer sedimentary interbeds. The overall purpose of the Board's inquiry is to address these uncertainties and assess the impact on estimating earthquake ground motions.

DOE has developed an overall program plan for reassessment of the Hanford earthquake ground motion. As part of executing this plan, DOE has undertaken the collection of additional subsurface geologic data. Efforts to acquire this data have been largely successful. Modeling of earthquake ground motion is also underway. Early results suggest that the assessment of earthquake ground motion is sensitive to assumed properties for both soils and bedrock (basalt and interbeds). Results from the modeling of earthquake ground motion will be reviewed to ensure that any changes to the overall Hanford design are conservative. If it is necessary to increase ground motion design parameters for the Hanford site, the impact on all projects in the design stage will need to be assessed.

4.1.2 Savannah River

Plutonium Storage

DOE is planning to consolidate its excess plutonium at Savannah River pending final disposition. Some of the material will be used as feed to manufacture mixed-oxide reactor fuel. DOE is in the preliminary stages of design for modifications to the K-Area facility that would allow immobilizing excess plutonium in glass and shipping the glass logs to the planned Yucca Mountain repository. Neither of these disposition paths will be completed in the next 10 years.

As requested by Congress, the Board evaluated the facilities planned to be used for this storage. In the mid-1990s, DOE had planned to store the excess plutonium in a new facility specifically designed for storage. This facility had been designed and excavation begun when DOE canceled its construction in 2001. This decision was based primarily on budget constraints and expectations that the plutonium would be disposed of in a short period of time. DOE's plans shifted to utilizing two 50-year-old facilities that do not meet modern safety standards, viz., the old K-Reactor facility in which several areas have been modified for storage, and Building 235-F. The K-Reactor plutonium storage facility is now called the K-Area Material Storage facility, commonly known as KAMS.

The Board's study concluded that storage of plutonium in KAMS could be safely accomplished for the next 4 or 5 years, but that for extended storage beyond this time, improvements in fire protection should be undertaken. The Board's study further concluded that DOE should not plan on extended storage of plutonium in Building 235-F without substantial modernization of the safety systems and confirmation of the building's structural adequacy.

The Board issued its report to Congress and DOE on December 1, 2003, and a follow-up status report on May 28, 2004. In the latter report, the Board continued to encourage DOE to take a more comprehensive view of the current situation with regard to disposition of its excess plutonium. The Board noted that for extended storage, consolidation of excess plutonium into a single, robust facility was logical from a safety, security, and economic perspective.

In the summer of 2004, DOE completed a study (proposed by the Board) of the various plutonium storage options. DOE reached the conclusion that using KAMS and Building 235-F was still the best option. However, the Board believes that the report is based on unfounded assumptions that shortened the needed storage duration. (A short duration for storage biases the

conclusions toward acceptance of incremental improvements to existing facilities.) Since completing that study, DOE has determined that meeting new security requirements in two old facilities will not be cost effective. Therefore, DOE has again changed its plans and is pursuing modifications to KAMS that would allow storage of all excess plutonium.

While the Board agrees with abandoning the use of Building 235-F, further study of the revised plan for storage of more plutonium in KAMS will be required. The Board still believes that the potentially large cost to retrofit this old facility to meet current safety and security requirements could be better spent on a new facility specifically designed for safe and secure storage.

Salt Waste Processing Facility

The Board reviewed the facility design and identified weaknesses in the performance categorization and potential seismic interactions of various portions of the facility. In a letter to DOE dated August 27, 2004, the Board questioned the adequacy of this facility's confinement function during a potential earthquake. DOE plans to upgrade certain structural components to address the seismic interaction concerns and to perform further analysis of the facility performance categorization.

Pit Disassembly and Conversion Facility

The Board has been reviewing the structural design for the Pit Disassembly and Conversion Facility. The Board has ensured that the structural design criteria were adequate, the geotechnical evaluations were appropriate, and the soil-structure interaction analysis was thorough and complete. In response to a May 13, 2003 letter from the Board, the contractor conducted a fire risk analysis to assess a seismically induced full-facility fire. The Board is reviewing the final design to ensure that it is adequate and incorporates appropriate defense-in-depth.

Tritium Extraction Facility

The Tritium Extraction Facility will be used to extract tritium from target rods irradiated in commercial light water reactors. The extracted tritium is to be used to replenish tritium reserves for the nation's nuclear weapons stockpile. During the past 7 years, the Board conducted extensive reviews and provided comments to DOE on the design and construction of the facility. The Board has concluded that the design provides adequate controls to address the hazards posed, and that the buildings were constructed (and the safety-related components were fabricated) in accordance with design requirements.

During 2004, the Board reviewed component testing activities and preparations for startup of the facility planned for September 2006. In general, the test program appears to be progressing acceptably with the exception of the process control system software, which includes the safety-significant Worker Protection System. The accelerated construction schedule has caused significant delays in the development of the process control system software. The Board will continue to provide oversight of testing activities and startup preparations in 2005 and 2006.

4.1.3 Y-12 National Security Complex.

Highly Enriched Uranium Materials Facility

The Board has continued its design reviews of the High Enriched Uranium Materials Facility at the Y-12 National Security Complex. The Board conducted detailed reviews of important safety systems and identified deficiencies in the design of the electrical, ventilation, fire protection, instrumentation and control systems, and in the structural design. In response, DOE has incorporated greater reliability into the electrical design, has added steel reinforcement details to the concrete structure to better resist an earthquake, and is working to resolve the other design problems.

Enriched Uranium Manufacturing Facility

The Enriched Uranium Manufacturing Facility is a new project at Y-12 in the conceptual design phase. When complete, it will replace a number of aging facilities that process enriched uranium. The Board plans to provide technical oversight of this project throughout design and construction.

4.1.4 Los Alamos National Laboratory

In a letter dated July 19, 2003, the Board objected to the laboratory's failure to follow DOE requirements for the design and installation of new safety-class equipment in Technical Area 18. In a follow-up review conducted in 2004, the Board learned that while equipment had been installed in two critical assemblies and designed for the other three, the issues identified in the July 2003 letter had not been addressed. Based on the Board's repeated identification of the inadequacy of the designs, confirmed in an independent quality assurance assessment by the NNSA Service Center, the laboratory finally stopped work on the safety class control systems and initiated planning for a thorough independent design review. NNSA directed that the control system remain non-operational and that no further funds be expended until the design review is complete.

4.1.5 Pantex

DOE is upgrading Building 12-64 so that it once again can house nuclear explosive operations. The Board noted structural deficiencies in the existing roof design and emphasized the need for the upgrade to provide a permanent solution. A fiber-reinforced polymer composite system was utilized to strengthen the roof slabs for earthquake loads. The design was modified to incorporate the Board's comments on the preliminary analysis and design. The Board found the final design to be technically sound.

The project established an administrative limit on the quantity of high explosives to preclude failure of the roof slabs. The Board questioned, however, whether the initial analysis work justified the new explosive limits. DOE thereafter modified the methodology to include a quantification of the hazard so that a rational and justifiable limit could be selected. The final explosive limits were reviewed by the Board and found to provide an adequate level of safety.

5. NUCLEAR SAFETY PROGRAMS AND ANALYSIS

5.1 FEDERAL OVERSIGHT

5.1.1 Overview

To meet its statutory health and safety mandate, the Board must continuously assess DOE's ability to conduct adequate oversight of contractors working on defense nuclear facilities. In this context, oversight includes Federal line-management assessment of contractors, contractor self-assessment, and independent assessment. For much of the work conducted in the defense nuclear complex, DOE relies upon contractors to perform inherently risky activities in government-owned facilities. These activities are nevertheless governed by nuclear safety requirements promulgated by the government. Thus, DOE fills three simultaneous roles: owner, customer, and regulator. Preventing conflict among these roles requires a complex oversight system strained by competing demands that must be reconciled to ensure that the overall mission is achieved safely.

5.1.2 Recommendation 2004-1

Information developed by the Columbia Accident Investigation Board with respect to the loss of the space shuttle and by the U. S. Nuclear Regulatory Commission in connection with the "near miss" at the Davis-Besse nuclear power plant suggests that weakening federal oversight of contractor operations can have dire consequences. In furtherance of its statutory duty to protect the public health and safety from hazards at defense nuclear facilities and its charge to restore confidence in DOE's management capabilities, the Board conducted two public meetings in February 2004. During these meetings, the Board heard testimony from Department of Energy's Principal Deputy Administrator for Military Applications and from the Assistant Secretary for Environment, Safety and Health.

Based on the record of the public hearings and its prior study of DOE's oversight program, the Board determined that action needed to be taken to reverse the course DOE had set itself upon. In particular, the Board saw the need to counter: (1) an increased emphasis on productivity at the possible expense of safety; (2) the loss of technical competence and understanding at high levels of DOE's and NNSA's organizational structure; (3) an apparent lack of interest in safety research; and (4) reduced central oversight of safety. On May 21, 2004, the Board issued Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*, along with an in-depth technical report, *Safety Management of Complex, High-Hazard Organizations* (DNFSB/TECH-35). (The recommendation is reprinted in its entirety in Appendix A.) Two months later, the Secretary of Energy accepted the recommendation and assigned a DOE team to develop an implementation plan.

On December 23, 2004, DOE submitted an implementation plan for the Board's review. This plan divides the actions that DOE will take in response to the recommendation into three broad areas:

- Strengthening Federal Safety Assurance,
- Learning from Internal and External Operating Experience, and
- Revitalizing Integrated Safety Management.

DOE committed to the following specific actions:

- Establish two Central Technical Authorities, one within NNSA, and the other reporting to the Under Secretary for Energy, Science and Environment.
- Implement and strengthen the DOE Oversight Model.
- Establish a permanent nuclear safety research function.
- Complete an analysis of the staffing requirements, and ensure the qualification of federal safety assurance personnel.
- Establish and verify implementation of new processes and criteria for delegation of safety-related authority.
- Establish and implement an Operating Experience Program, as a key element of improving the Feedback and Improvement core function of ISM.
- Complete field element action plans to improve work planning and work control.

Although the Board generally agreed with the overall direction of the implementation plan, a complete analysis of its adequacy has just begun.

5.2 INTEGRATED SAFETY MANAGEMENT

5.2.1 Overview

ISM is a concept that evolved from Recommendation 95-2. The basic tenets of ISM provide the framework for safely performing all of the diverse hazardous activities in the defense nuclear complex. ISM provides for a single safety management program rather than multiple, unintegrated programs (e.g., quality assurance and environmental management). Nuclear safety is an important but not exclusive target of ISM. Nonradioactive hazardous materials and operations require attention in proportion to the risks they pose to the public, workers, and the environment. ISM builds upon standards of safe practice for nuclear, chemical, and other hazardous operations to ensure protection of the public, workers, and the environment.

Since the Board's issuance of Recommendation 95-2, the implementation of ISM has progressed through three phases: (1) developing necessary guidance documents; (2) establishing the infrastructure for implementing ISM at individual sites and facilities; and (3) confirming that ISM systems are effective and are being applied to design and construction, start-up, operation, and decommissioning of DOE's hazardous facilities. At the end of 1999, the implementation of ISM was well into the second phase. With the successful completion of ISM System Verification Reviews at all sites during 2000, the Board's focus on implementation of ISM shifted to the third phase. Throughout 2004, the Board stressed the need to look beyond initial implementation to ensure continued improvement and revitalization. In addition to ensuring that ISM was implemented at all DOE sites, the Board focused on three key initiatives that are critical to the long-term effectiveness of ISM: the annual update process, completion of Recommendation 2000-2 tasks, and activity-level implementation.

5.2.2 Ongoing Assessments

In 2004, the Board continued to oversee implementation and effectiveness of ISM at defense nuclear facilities. The Board evaluated efforts of the Energy Facility Contractors Group to improve ISM and assessed updated ISM descriptions for several sites. The Board has also instituted a series of assessments of ISM implementation at each NNSA field site and at NNSA headquarters. These assessments are aimed at revitalizing implementation of ISM principles and core functions within NNSA.

5.2.3 Vital Safety Systems

Defense nuclear facilities typically incorporate safety systems designed to control the hazards present. Conditions specifying operational limits for these systems are placed into Authorization Agreements between DOE and its contractors. For the many facilities constructed decades ago, maintenance to ensure continued reliability of vital safety systems is a critical task.

In response to Recommendation 2000-2, DOE has taken steps to ensure the operability of vital safety systems. During 2004, DOE actions in this regard included in-depth reviews of specific systems and programs (such as configuration management) known to have problems. These reviews uncovered weaknesses in the operability of several systems, leading to further evaluation. As a result of the evaluations, DOE's Office of Environmental Management has formulated corrective actions and has demonstrated an intent to meet individual milestones in Recommendation 2000-2. On the other hand, the Board has found that several NNSA sites have failed in this regard. Los Alamos National Laboratory has been unable to provide adequate evidence of commitments to the recommendation due to the extended laboratory-wide stand-down. Recent reviews at Lawrence Livermore National Laboratory have identified significant failures in configuration management, as highlighted to NNSA in a letter from the Board dated November 3, 2004.

In early 2003, the Board found that few DOE site offices had fully staffed and implemented the federal oversight program for safety systems to which DOE committed in the implementation plan. By late 2003, DOE had applied more senior management attention and resources to staffing and qualifying technical personnel for these systems engineering organizations. In 2004, subject to the Board's oversight, DOE revised and strengthened Manual 426.1-1, *Federal Technical Capability Manual*, defining federal safety system oversight responsibilities and technical competencies. Issuance of this manual provides a sound basis for the more uniform implementation of safety system oversight throughout DOE. DOE also began a systematic review of the implementation of the safety system oversight program at each of its site offices.

5.2.4 Activity Level Work Planning

The Board has continuously emphasized the importance of ensuring that hazards are identified and controlled, that work is performed in a careful manner in accordance with the safety controls, and that DOE uses appropriate feedback mechanisms to ensure continuous improvement at the individual activity level. In 2004, the Board conducted site-specific ISM

reviews that revealed significant deficiencies at the Nevada Test Site and at Savannah River. These deficiencies were made known to NNSA and the Office of Environmental Management in separate letters dated May 21 and December 13, 2004. The Board will continue to monitor ISM implementation in 2005.

5.3 HEALTH AND SAFETY DIRECTIVES

5.3.1 Improvement of Directives

During 2004, the Board received nearly 60 new or revised drafts of health and safety directives and policy letters from DOE. Highlights of the Board's reviews follow:

- **Nuclear Explosive Safety Directives**. The process by which NNSA ensures that nuclear explosive operations are safe has been the subject of a significant amount of correspondence, including several formal recommendations. From the time of the creation of NNSA, this process had gradually changed, such that it became less formal and repeatable. In a letter dated July 9, 2003, the Board pointed out to NNSA that it was not acting on the corrective actions recommended by its own Senior Technical Advisory Panel on Nuclear Explosive Safety Studies. By January 2004, the Board's concern with the lack of coordinated effort led to a letter requiring NNSA to provide a plan and schedule to update the controlling directives for nuclear explosive safety. By the end of 2004, NNSA had revised and published the controlling DOE standard for nuclear explosive safety studies, as well as two supporting documents. These documents represent a significant step toward formalizing and standardizing the nuclear explosive safety processes. Revisions to the related DOE Orders, as well as development of lower tier guidance, will continue through 2005.

- **Electrical Safety Handbook**. In June 2001, the Board urged DOE to take a leadership role with respect to electrical safety. DOE agreed in August 2002 to update its *Electrical Safety Handbook*. However, in July 2003 the Board learned to its dismay that DOE had deleted much of the technical content in the proposed revision. In an August 7, 2003 letter, the Board informed DOE that this was unacceptable, especially in light of the high rate of electrical safety incidents observed across the defense nuclear complex. In letters dated September 5 and December 15, 2003, DOE agreed to revise the handbook to include technical details on electrical safety and guidance for an effective electrical safety program. Following a resolution of the Board's comments, DOE published an acceptable version of the handbook in December 2004.

- **Environment, Safety, and Health Reporting**. During 2003, the Board provided technical advice on DOE's effort to consolidate and revise various reporting orders into a single directive. The Board commented on draft DOE Order 231.1A, *Environment, Safety and Health Reporting* and its many supporting documents. During 2004, the Board monitored closely the effectiveness of the implementation of this order, which is key to maintaining a strong feedback and improvement program

across the defense nuclear complex. While there have been minor problems noted with the implementation, in general it has proceeded well.

- **Hoisting and Rigging Safety**. The Board continued to oversee DOE's programs, policies, and practices in hoisting and rigging work at defense nuclear facilities. By integrating insights from a number of field reviews, the Board provided substantive input to DOE as it revised Standard 1090-2004, *Hoisting and Rigging*. As a result, significant revisions were made to this standard that will further enhance the safety of hoisting and rigging activities at all DOE sites.

- **Functional Area Qualification Standards**. During the past three years, the Board has driven DOE to upgrade and incorporate 30 functional area qualification standards for federal employees into the DOE directives system. During the past year, the Board reviewed and evaluated 14 functional area qualification standards such as nuclear explosive safety, facility maintenance, and technical training. This effort significantly improved the technical content and rigor of the entire set of DOE functional area qualification standards.

5.3.2 Development of New Directives

The Board conducted a comprehensive evaluation of DOE's use of quantitative risk assessment and related methodologies at defense nuclear facilities. The evaluation revealed that DOE has used quantitative risk assessment in the development of documented safety analyses and other facility-level decision-making activities. In some cases, the results of risk assessments appear to have influenced the selection of safety controls. The Board also found that DOE does not appear to have a central authority (or technical resource) that oversees the use of quantitative risk assessment. The results of the Board's review were documented in a letter to DOE dated April 5, 2004. In response to the Board's observations, DOE has committed to developing a comprehensive policy governing the use of risk assessment methodologies at defense nuclear facilities. DOE has developed a draft policy statement and is continuing to investigate the need for additional guidance in this area.

5.3.3 Worker Safety Rulemaking

On December 8, 2003, DOE published in the *Federal Register* a proposed rule on worker protection, 10 CFR Part 851, *Worker Safety and Health*. This action was required under the Bob Stump National Defense Authorization Act, Public Law 107-314, which directed DOE to promulgate regulations on worker safety and health, rather than rely exclusively on a contractual approach. The Board conducted a detailed review of the proposed rule and found that as written, it would have greatly lessened the safety requirements embedded in DOE Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*. The Board so informed the Secretary by letter dated January 29, 2004. The Secretary suspended the rulemaking in late February 2004, and in the ensuing months, the Board devoted considerable resources to assisting DOE in preparing an acceptable rule. DOE published a revised rule for public comment on January 26, 2005.

5.3.4 Scope of the Directives System

A safety directive can only contribute to health and safety if it is imposed via contractual terms and implemented competently. In 2004, the Board continued to oppose DOE's ill-considered initiatives to reduce the applicability of safety orders to defense nuclear facilities. By the end of 2004, DOE had withdrawn changes to Order 251.1A, *Directives System*, and formed a working group to reexamine the applicability question. Continued intense oversight of this matter will be continued throughout 2005.

5.4 SAFETY PROGRAMS

5.4.1 Development and Implementation of Safety Controls

The development of a comprehensive safety basis and the identification and selection of an appropriate control set are essential cornerstones of safe operation at defense nuclear facilities. For this reason, in 2004 the Board continued its aggressive program to review safety bases throughout the DOE complex. These reviews revealed a number of specific instances where improper and non-conservative assumptions and methodologies were used in the development of safety bases.

The Board conducted reviews of the documented safety analyses at Pantex, Los Alamos, Hanford, Nevada Test Site, and Sandia, and evaluated the use of WIPP's Mobile Waste Characterization and Loading Units at other sites. Typical corrective actions include the following:

- At the Hanford Tank Farms, DOE rewrote the Technical Safety Requirements to reinstate key controls (such as Process Control Plans) that the Board discovered were improperly eliminated; lack of these controls creates a risk of retaining and releasing significant quantities of flammable gas.

- DOE revised the Basis for Interim Operation for the WIPP Mobile Waste Characterization and Loading Units to address the significant technical deficiencies identified by the Board, including incorrect modeling of accident scenarios, lack of proper documentation of accident analyses, and potentially inadequate identification and classification of controls for protection of the public and workers.

- At Sandia National Laboratories, independent review teams confirmed systematic weaknesses identified by the Board in the safety analyses for its nuclear facilities. In response, NNSA and the laboratory have postponed start-up activities and reallocated resources to correct the deficiencies in the safety analyses of the dynamic nuclear facilities.

5.4.2 Administrative Controls

Contractors at defense nuclear facilities were required by 10 CFR Part 830 to submit documented safety analyses and controls to DOE by April 2003. To meet this requirement,

many contractors had to develop new analyses and, perhaps more importantly, new safety controls. In many cases, the choice of these new safety controls was limited because the equipment installed had been built years or even decades ago. This led some contractors to reclassify existing equipment as safety-related and to rely on safety-related administrative controls rather than engineered features. In Recommendation 2002-3, the Board advised DOE to improve its guidance for the use of administrative controls at defense nuclear facilities. Responding to the recommendation, DOE developed and implemented a plan to improve the reliability and effectiveness of administrative controls that serve safety functions. As a key step in the implementation plan, DOE has developed and issued a new standard, *Specific Administrative Controls* (DOE-STD-1186). DOE has also developed a set of training materials used to introduce the new requirements to field personnel.

5.4.3 Active Confinement Ventilation

During the past few years, the Board has reviewed numerous safety analysis reports and documented safety analyses for defense nuclear facilities. In certain cases, the Board has noticed that the functional classification of ventilation systems in existing defense nuclear facilities is being downgraded from safety-class or safety-significant, and the building structure is being relied upon to confine the release of radioactive material should an accident occur. This approach is unacceptable because: (1) it relies on calculations that do not account for large uncertainties; (2) it is based on analytically-determined building leak path factors found by combining several computer programs not specifically designed for this purpose; and (3) it is generally impossible for these programs to model the true conditions of a real accident because of the uncertain behavior of the workers and emergency crews responding to the event. On December 7, 2004, the Board issued Recommendation 2004-2, *Active Confinement Systems*. (The Recommendation is reprinted in its entirety in Appendix A.) This recommendation advises DOE to disallow primary reliance on passive confinement systems and require the use of active confinement ventilation systems in all Hazard Category 2 and 3 facilities and projects.

5.4.4 Quality Assurance

During 2004, the Board continued to demand that DOE improve the implementation of quality assurance (QA) Programs. While DOE has completed most of the commitments in its *Quality Assurance Improvement Plan*, there remain frequent QA-related breakdowns at both the activity level and the institutional level. As part of this plan, NNSA has developed a set of quality assurance verification questions on design, procurement, fabrication, construction, and operation. The questions were used to complete QA assessments at each NNSA site as part of verifying that QA programs have been effectively implemented. These assessments are being reviewed by NNSA; initial results indicate that procurement of safety equipment should be improved. During the past year, DOE contractors formed a quality assurance working group under the auspices of the Energy Facility Contractors Group. This group has already provided a notification of potential weld quality issues and a guide for developing a Quality Improvement Program. The Board views the contractors' effort as useful, in that broad expertise can be assembled to quickly develop and disseminate information and guidance.

5.4.5 Software Quality Assurance

The safe design and operation of many of DOE's defense nuclear facilities rests upon the analysis and operational support provided by computer codes. During the past few years, the Board has identified safety deficiencies caused by inadequate software design, implementation, testing, configuration management, and training of personnel. For this reason, in late 2002 the Board issued Recommendation 2002-1 to force significant changes in DOE's policies and practices for software quality assurance. During the past year DOE, under close scrutiny by the Board, completed assessments of safety software at almost all defense nuclear facilities. Problems identified at specific sites were studied by headquarters personnel for applicability across the complex. DOE has developed corrective actions and will implement them in 2005.

5.4.6 Hoisting and Rigging

Throughout 2004, the Board continued to review the development and implementation of critical hoisting and rigging activities. In a letter dated July 10, 2003, the Board provided an assessment to DOE of the hoisting and rigging program at Pantex as well as general observations pertaining to all sites. This assessment identified a number of weaknesses in equipment design, reliability, maintenance, and training. During 2004, DOE made substantial safety improvements in this program at Pantex.

At Nevada Test Site, the Board's review led to a letter dated January 21, 2004, in which the Board questioned the safety classification of hoisting and rigging equipment. As a result, DOE has redesignated as safety-class the critical safety equipment used in G-tunnel for the handling of damaged nuclear weapons and improvised nuclear devices. On a generic level, the Board provided technical oversight of DOE's Hoisting and Rigging Technical Advisory Committee, which is working on a revised hoisting and rigging standard.

5.4.7 Criticality Safety

When closing Recommendation 97-2 in August 2003, the Board stressed the need for aggressive self-assessment programs and expanded use of operational facility reviews and independent oversight. The Board also requested an annual report from DOE on the status of this program. Unfortunately, DOE's performance to date has been unsatisfactory. DOE has failed to review effectively each site's nuclear criticality safety programs using knowledgeable professionals; has not provided adequate staff for criticality safety work; and has not conducted trending and analysis of performance indicators with sufficient rigor. In a letter dated May 21, 2004, the Board again cautioned DOE to proceed with care in the plan to relocate the Critical Experiment Facility from the Los Alamos National Laboratory to Nevada Test Site. This relocation could damage criticality safety programs at Los Alamos and undermine coordination of criticality work among the Test Site, Los Alamos, and Lawrence Livermore. To highlight the Board's emphasis on criticality safety, a member of the Board provided the keynote presentation on this topic at both the 2004 summer and winter meetings of the American Nuclear Society.

5.4.8 Suspect and Counterfeit Parts

The Board continued to provide oversight and technical assistance to DOE in order to identify and prevent the introduction of suspect and counterfeit parts into safety-related or mission sensitive applications affecting defense nuclear facilities. During the past year, DOE discovered that valves had been procured from a major valve vendor who provided invalid certifications. In this instance, DOE's improved process for handling notifications appeared to operate in a much more satisfactory manner. The Board also provided technical oversight to DOE as it revised Order 414.1A, *Quality Assurance*, and accompanying guidance to ensure inclusion of requirements and guidance to detect suspect and counterfeit parts.

5.5 TECHNICAL COMPETENCE

5.5.1 Training and Qualification of DOE and Contractor Personnel

The Board has long recognized the value and necessity of intense training programs for operators and key health and safety personnel at defense nuclear facilities. Based on the results of a number of reviews and inquiries, the Board determined in 2003 that many NNSA facilities were not performing audits of facility training programs as required by DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*. In an April 2003 letter to NNSA, the Board pointed out that these training deficiencies may affect the contractor's ability to maintain and improve conduct of operations.

By August 2004, the Board found that senior NNSA management had not taken any action to upgrade the programs at these three sites. In a letter to NNSA dated August 6, the Board requested a report defining the problem within 45 days and a corrective action plan within 30 additional days. In response, NNSA has assessed the status of most of its training programs and has developed action plans to ensure that all of the required assessments are performed in accordance with the DOE Order 5480.20A.

5.5.2 NNSA Facility Representatives

In March 2004, the Board conducted on-site reviews of the staffing levels and training of DOE's facility representatives at the Pantex, Sandia, and Los Alamos Site Offices. The Board found that both staffing and training were inadequate in all three offices, and so informed NNSA in a letter dated May 14, 2004. Responding on July 13, 2004, the NNSA Administrator agreed that action was needed at all NNSA sites to strengthen the facility representative program. Since that time, NNSA has improved its activity-specific hazard training and has developed a more rigorous means of establishing a minimum staffing level at each office.

6. PUBLIC OUTREACH

6.1 PUBLIC MEETINGS

During 2004, the Board conducted two public meetings in Washington, D.C., regarding DOE oversight policy.

6.2 RESPONDING TO PUBLIC REQUESTS

The Board answered numerous public requests for documents and information and responded to 30 requests filed under the Freedom of Information Act (FOIA). The average response time for FOIA requests was 7.1 working days, as compared with the statutory requirement of 20 working days. The Board's website contains a complete list of FOIA requests processed since 2001.

6.3 ELECTRONIC ACCESS

The Board posts all essential, publicly-releasable documents on its website (www.dnfsb.gov) in a timely manner. All documents can be downloaded in Adobe PDF format. The Board also mails paper copies of certain documents (annual reports, technical reports, public hearing notices, and others) to a list of more than four hundred addressees. There were four such mailings in 2004. An initiative was begun in 2004 to offer those on the Board's mailing list the option of receiving documents via e-mail in lieu of paper copies. This would serve to speed distribution of these documents, provide significant savings in printing and postal costs, and further the Board's E-Government initiative.

The Board continues to evaluate the effectiveness of its information security program to ensure that it is in compliance with the requirements of the Federal Information Security Management Act and other related standards and guidance. During 2004, the Board's information technology security staff upgraded computer security by measures such as strengthening the Board's internet firewall to prevent intrusion. The Board commissioned the National Institute of Standards and Technology to perform an independent evaluation of its information security program during 2004 to ensure that past improvements have been successfully implemented and to detect any additional weaknesses.

6.4 INQUIRIES INTO HEALTH AND SAFETY ISSUES

The Board often receives information regarding potential health and safety hazards from private citizens or from employees at defense nuclear facilities. The Board treats these matters with the utmost seriousness by assigning members of its legal and technical staffs to investigate or inquire further. These inquiries, which may involve interviews, review of documents, and site visits, are continued until the Board is able to reach a technical judgment on the issues raised. If the Board finds that a health or safety hazard exists, it takes prompt action to inform DOE and closely monitors DOE's corrective actions. When the Board receives information on matters outside its jurisdiction, such as alleged criminal activities or unlawful personnel practices, it refers the information to the appropriate federal agency for action.

During 2004, the Board directed inquiries into health and safety issues at Hanford, Fernald, Savannah River, Los Alamos, Sandia, Lawrence Livermore, and Pantex. The Fernald review resulted in improved safety analyses and work controls for the Silos Project. Similarly, the reviews at the other sites led to improved safety and hazards analyses.

6.5 SITE REPRESENTATIVE ACTIVITIES

The Board enhances its on-site health and safety oversight of defense nuclear facilities by assigning experienced technical staff members to full-time duty at priority DOE sites: Pantex, Hanford, Savannah River, Y-12 (Oak Ridge), Los Alamos, and as of August 9, 2004, Lawrence Livermore. Site representatives conduct first-hand assessments of nuclear safety management to identify health and safety concerns promptly. They meet regularly with the public, union members, Congressional staff members, and public officials from federal, state, and local agencies. The Board receives regular briefings from its site representatives in person and maintains continuous contact with them using all available communications media.

APPENDIX A

RECOMMENDATION 2004-1

RECOMMENDATION 2004-2

selected on a standardized basis for their preeminence in the field of amputee patient care. The Board will include members familiar with aspects of patient care, psychosocial issues, and family issues. Members will also be chosen who have broad experience in areas which impact on quality improvement in amputee patient care such as education and training. The Board shall meet at least twice each year to monitor the amputee patient care programs and services and insure effective organizational planning. The Board will also ensure that through the collaboration of a multi-disciplinary team, the U.S. Army Amputee Patient Care Program is providing world-renowned amputee care, assisting their patients as they return to the highest levels of physical, psychological, and emotional well being.

FOR FURTHER INFORMATION CONTACT: Contact Ms. Jennifer Spaeth, DoD Committee Management Officer, 703–588–8151.

Dated: May 28, 2004.

L.M. Bynum,

Alternate OSD Federal Register Liaison Officer, Department of Defense.

[FR Doc. 04–12725 Filed 6–4–04; 8:45 am]

BILLING CODE 5001–08–M

DEPARTMENT OF DEFENSE

Office of the Secretary; Defense Science Board

AGENCY: Department of Defense.

ACTION: Notice of Advisory Committee Meeting.

SUMMARY: The Defense Science Board Task Force on Employment of the National Ignition Facility (NIF) will meet in closed session on June 21–22, 2004, at Lawrence Livermore National Laboratory. This Task Force will review the experimental program under development for the National Ignition Facility, NIF is a key component of the National Nuclear Security Administration's (NNSA's) Stockpile Stewardship Program to maintain the nuclear weapons stockpile without nuclear testing. The NIF is a 192-beam laser designed to achieve fusion ignition and produce high-energy-density condition approaching those of nuclear weapons. NNSA and the high-energy-density physics community have developed a plan for activation and early use of NIF which includes a goal to demonstrate ignition by 2010 and also supports high priority, non-ignition experiments required for stockpile stewardship. In this assessment, the task force will assess the proposed ignition and "non-ignition" high-energy-density experimental programs at NIF. Review the overall balance and priority of activities within the proposed plan and the degree to which the proposed program of NIF experiments supports the near and long term goals of stockpile stewardship and the overall NIF mission. Assess the potential for NIF to support the design and development of new weapons. Focus on the extent to which major stakeholders in NIF are effectively integrated into the plan.

The mission of the Defense Science Board is to advise the Secretary of Defense and the Under Secretary of Defense for Acquisitions, Technology & Logistics on scientific and technical matters as they affect the perceived needs of the Department of Defense. At these meetings, the Defense Science Board Task Force will assess the proposed ignition and "non-ignition" high-energy-density experimental programs at NIF. Review the overall balance and priority of activities within the proposed plan and the degree to which the proposed program of NIF experiments supports the near and long term goals of stockpile stewardship and the overall NIF mission. Assess the potential for NIF to support the design and development of new weapons. Focus on the extent to which major stakeholders in NIF are effectively integrated into the plan.

In accordance with Section 10(d) of the Federal Advisory Committee Act, Pub. L. No. 92–463, as amended (5 U.S.C. app. II), it has been determined that these Defense Science Board Task Force meetings concern matters listed in 5 U.S.C. 552b(c)(1) and (4) and that, accordingly, these meetings will be closed to the public.

Dated: May 28, 2004.

L.M. Bynum,

Alternate OSD Federal Register Liaison Officer, Department of Defense.

[FR Doc. 04–12726 Filed 6–4–04; 8:45 am]

BILLING CODE 5001–06–M

DEPARTMENT OF DEFENSE

Department of the Army

Army Science Board; Notice of Open Meeting

In accordance with section 10(a)(2) of the Federal Advisory Committee Act (Pub. L. 92–463), announcement is made of the following Committee Meeting:

Name of Committee: Army Science Board (ASB).

Date(s) of Meeting: 10 & 11 June 2004.

Time(s) of Meeting: 0800–1700, 10 June 2004; and 0800–1700, 11 June 2004.

Place: Hilton Hotel, Crystal City, VA.

1. *Agenda:* The Army Science Board FY04 Summer Studies, Force Balance and FCS Urban Operations are holding a plenary meeting on the 10th & 11th of June 2004. The meeting will be held at the Hilton Hotel in Crystal City, VA. The meeting will begin at 0800 hrs on the 10th and will end at approximately 1700 hrs on the 11th. For further information regarding Force Balance, please contact LTC Al Alkee @ (703)–601–0676 or e-mail *@Alvin.Klee@ocar.army.pentagon.mil.* For FCS Urban Operations, please contact MAJ Al Visconti @ (865) 574–8798 or e-mail *@viscontiaj@ornl.gov.*

Wayne Joyner,

Program Support Specialist, Army Science Board.

[FR Doc. 04–12802 Filed 6–4–04; 8:45 am]

BILLING CODE 3710–08–M

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

[Recommendation 2004–1]

Oversight of Complex, High-Hazard Nuclear Operations

AGENCY: Defense Nuclear Facilities Safety Board.

ACTION: Notice, recommendation.

SUMMARY: The Defense Nuclear Facilities Safety Board has unanimously approved Recommendation 2004–1, for DOE to consider. Recommendation 2004–1 deals with Oversight of Complex, High-Hazard Nuclear Operations.

DATES: Comments, data, views, or arguments concerning the recommendation are due on or before July 7, 2004.

ADDRESSES: Send comments, data, views, or arguments concerning this recommendation to: Defense Nuclear Facilities Safety Board, 625 Indiana Avenue, NW., Suite 700, Washington, DC 20004–2001.

FOR FURTHER INFORMATION CONTACT: Kenneth M. Pusateri or Andrew L. Thibadeau at the address above or telephone (202) 694–7000.

Dated: June 1, 2004.

John T. Conway,

Chairman.

[Recommendation 2004–1]

Oversight of Complex, High-Hazard Nuclear Operations

Dated: May 21, 2004.

Background

In furtherance of its statutory duty to oversee the Department of Energy's

(DOE) protection of workers and the public from hazards at defense nuclear facilities operated for DOE and the National Nuclear Safety Administration (NNSA), the Defense Nuclear Facilities Safety Board (Board) conducted eight public hearings to examine DOE's current and proposed methods of ensuring safety at its defense nuclear facilities.

In these hearings, the Board also sought to benefit from the lessons learned as a result of investigations conducted following the *Columbia* Space Shuttle disaster and the discovery of the deep corrosion in the reactor vessel head at the Davis-Besse Nuclear Power Plant. The Board received testimony from representatives of the Nuclear Regulatory Commission; the Naval Reactors Program; the Columbia Accident Investigation Board; the Deputy Secretary of Energy; the Administrator of NNSA; DOE's Under Secretary of Energy, Science and Environment; DOE's Assistant Secretary for Environment, Safety, and Health; and selected site managers of DOE's facilities, senior contractor managers, and members of the public.

The overall objective of the hearings was to gather information that could be helpful in assessing DOE's proposals for changing the methods it uses for contract management and nuclear safety oversight, as they have been controlled through the DOE Directives System. NNSA has proposed shifting responsibility for safety oversight from DOE Headquarters to the DOE field offices and site contractors. The key question the Board sought to address was: Will modifications proposed by DOE/NNSA to organizational structure and practices, as well as increased emphasis on productivity, improve or reduce safety, and increase or decrease the possibility of a high-consequence, low-probability nuclear accident?

DOE's programs for national security and environmental protection are complex, with potentially high consequences if not safely performed. Mishandling of nuclear materials and radioactive wastes could result in unintended nuclear criticality, dispersal of radioactive materials, and even nuclear detonation. DOE has a long and successful history of nuclear operations, during which it has established a structure of requirements directed to achieving nuclear safety. That structure is based on such methods as defense in depth, redundancy of protective measures, robust technical competence in operations and oversight, extensive research and testing, a Directives System embodying nuclear safety requirements, Integrated Safety Management, and processes to ensure safe performance.

The United States owns the defense nuclear facilities at which its programs are carried out by a government agency—DOE. Each such facility is operated by a contractor that was selected by DOE on the basis of being best suited to conduct the work for DOE at that site. Under the original Atomic Energy Act of 1946 and continuing to date in the Atomic Energy Act of 1954, as amended, the government officials in charge (*i.e.*, the Secretary of Energy and other line officers) have a statutory responsibility to protect health and minimize danger to life or property. In any delegation of responsibility or authority to lower echelons of DOE or to contractors, the highest levels of DOE continue to retain safety responsibility. While this responsibility can be delegated, it is never ceded by the person or organization making the delegation. Contractors are responsible to DOE for safety of their operations, while DOE is itself responsible to the President, Congress, and the public.

This reality was highlighted during the course of the Board's hearings. Many important lessons were cited in the testimony provided. These included the importance of a centralized and technically competent oversight authority, central control of technical safety requirements and waivers for departure from those requirements, an ability to operate in a decentralized mode when appropriate, a willingness to accept criticisms, the need for retention of technical expertise and capabilities at high levels of any organization in which technical failure could have high consequences, and an awareness that complacency can arise from a history of successes. DOE representatives testified that DOE's attention to safety has continued to improve with better on-site oversight and self-assessment programs, use of Integrated Safety Management, careful attention to safety statistics, and stabilization and disposal of high risk nuclear materials. However, cause for concern with regard to the potential increase in the possibility of nuclear accidents was also evident in: (1) The increased emphasis on productivity at the possible expense of safety, (2) the loss of technical competency and understanding at high levels of DOE's and NNSA's organizational structure, (3) the apparent absence of a strong safety research focus, and (4) the reduced central oversight of safety.

Clearly, safety performance can benefit from attention to detail and lessons learned from small incidents and minor accidents. However, failures leading to high-consequence, low-probability accidents would likely have their roots in interactions between engineering failures and improper human actions. Because the consequences of large nuclear accidents would be unacceptable, the nuclear weapons complex cannot permit them to occur. While the potential for such accidents cannot be completely eliminated, their likelihood can be held to an insignificant level by rigorous attention to Integrated Safety Management with technical and operational excellence based on nuclear safety standards subject to rigorous oversight. In addition, nuclear safety must be founded on solid research, analysis, and testing to ensure an adequate understanding of energetic initiating mechanisms under off-normal conditions.

DOE has taken some preliminary steps toward its proposed changes in safety practices. These actions may have contributed to some unfortunate consequences, such as the following:

- A glovebox fire occurred at the Rocky Flats closure site, where, in the interest of efficiency, a generic procedure was used instead of one designed to identify and control specific hazards. Apparently, success of the cleanup project resulted in management complacency. DOE site management had given the impression that safety was less important than progress, and contract management had not emphasized oversight of work control processes.
- Downsizing of safety expertise has begun in NNSA's NA–53 organization, while field organizations such as the Albuquerque Service Center have not developed an equivalent technical capability in a timely manner. As a result, NNSA field offices are left without an adequate depth of understanding of such important matters as seismic analysis and design, training of nuclear workers, and protection against unintended criticality.
- DOE's Office of Environmental Safety and Health, with assistance from some sites and contractors, has reviewed DOE Directives to simplify safety requirements, with the objective of supporting accelerated operations that are also more efficient. This shift has led to proposals for downgrading some worker safety Directives to the level of guidance and modifying some radiation protection requirements. It has also led to a proposed modification of the Order on Worker Safety and Health to reduce requirements for protecting workers from the consequences of fires,

explosions, and discharges from high-pressure systems.

Proposed modifications to DOE and NNSA's organizational structure, manpower, contract management, oversight policies and practices, and safety directives could have unintended consequences. These include reduction of defense in depth, potentially inconsistent safety-related decisions caused by decentralization of safety authority, emphasis on performance as opposed to safety, and reduction of technical capability at key points in the organizational structure. DOE and NNSA line managers could be left with inadequate awareness of safety issues.

As a result of testimony it has received, the Board is not convinced of the benefit of the changes to DOE's and NNSA's organizational structure and practices as they have been described. The Board cautions that if any such changes are made, they must be done formally and deliberatively, with due attention given to unintended safety consequences that could reduce the present high level of nuclear safety. DOE should take full advantage of lessons learned from safety problems discovered by National Aeronautics and Space Administration and Nuclear Regulatory Commission, and it should learn from the success of the good organizational and safety practices championed by the Naval Reactors Program. The Board needs to be sure that any fundamental reorganization does not degrade nuclear safety, and that the likelihood of a serious accident, facility failure, construction problem, or nuclear incident will not be increased as a result of well-intentioned changes.

As a result of testimony received at the public hearings and the potential effects on safety at defense nuclear facilities outlined above, the Board recommends:

1. That delegation of authority for nuclear safety matters to field offices and contractors be contingent upon the development and application of criteria and implementing mechanisms to ensure that:

a. Oversight responsibility includes the capability for examining, assessing, and auditing by all levels of the DOE organization,

b. The technical capability and appropriate experience for effective safety oversight is in place, and

c. Corrective action plans consistent with recommendations resulting from internal DOE and NNSA reviews of the Columbia accident and the Davis-Besse incident are issued.

2. That to ensure that any features of the proposed changes will not increase the likelihood of a low-probability, high-consequence nuclear accident, DOE and NNSA take steps to:

a. Empower a central and technically competent authority responsible for operational and nuclear safety goals, expectations, requirements, standards, directives, and waivers;

b. Ensure the continued integration and support of research, analysis, and testing in nuclear safety technologies; and

c. Require that the principles of Integrated Safety Management serve as the foundation of the implementing mechanisms at the sites.

3. That direct and unbroken line of roles and responsibilities for the safety of nuclear operations—from the Secretary of Energy and the NNSA Administrator to field offices and sites—be insured according to appropriate Functions, Responsibilities, and Authorities documents and Quality Assurance Implementation Plans.

4. That prior to final delegation of authority and responsibility for defense nuclear safety matters to the field offices and contractors, DOE and NNSA Program Secretarial Officers provide a report to the Secretary of Energy describing the results of actions taken in conformance with the above recommendations.

John T. Conway,

Chairman.

[FR Doc. 04–12741 Filed 6–4–04; 8:45 am]

BILLING CODE 3670–01–P

DEPARTMENT OF EDUCATION

Submission for OMB Review; Comment Request

AGENCY: Department of Education.

SUMMARY: The Leader, Regulatory Information Management Group, Office of the Chief Information Officer invites comments on the submission for OMB review as required by the Paperwork Reduction Act of 1995.

DATES: Interested persons are invited to submit comments on or before July 7, 2004.

ADDRESSES: Written comments should be addressed to the Office of Information and Regulatory Affairs, Attention: Alice Thaler, Desk Officer, Department of Education, Office of Management and Budget, 725 17th Street, NW., Room 10222, New Executive Office Building, Washington, DC 20503 or faxed to (202) 395–6974.

SUPPLEMENTARY INFORMATION: Section 3506 of the Paperwork Reduction Act of 1995 (44 U.S.C. chapter 35) requires that the Office of Management and Budget (OMB) provide interested Federal agencies and the public an early opportunity to comment on information collection requests. OMB may amend or waive the requirement for public consultation to the extent that public participation in the approval process would defeat the purpose of the information collection, violate State or Federal law, or substantially interfere with any agency's ability to perform its statutory obligations. The Leader, Regulatory Information Management Group, Office of the Chief Information Officer, publishes that notice containing proposed information collection requests prior to submission of these requests to OMB. Each proposed information collection, grouped by office, contains the following: (1) Type of review requested, *e.g.*, new, revision, extension, existing or reinstatement; (2) Title; (3) Summary of the collection; (4) Description of the need for, and proposed use of, the information; (5) Respondents and frequency of collection; and (6) Reporting and/or Recordkeeping burden. OMB invites public comment.

Dated: June 1, 2004.

Angela C. Arrington,

Leader, Regulatory Information Management Group, Office of the Chief Information Officer.

Federal Student Aid

Type of Review: New.

Title: Final Performance Report for Preparing Tomorrow's Program To Use Technology (PT3) Grant Program.

Frequency: One time.

Affected Public: Not-for-profit institutions; Businesses or other for-profit; State, local, or tribal gov't, SEAs or LEAs.

Reporting and Recordkeeping Hour Burden:

Responses: 197.

Burden Hours: 3,940.

Abstract: This is the final performance report for approximately 197 PT3 FY 2000, 2001, and 2003 grantees. It is required by statute, Title II, Part B, by EDGAR 75.590, and by the Government Performance and Results Act (GPRA).

Requests for copies of the submission for OMB review; comment request may be accessed from *http://www.edicsweb.ed.gov*, by selecting the "Browse Pending Collections" link and by clicking on link number 2486. When you access the information collection, click on "Download Attachments" to view. Written requests for information should be addressed to U.S. Department of Education, 400 Maryland Avenue, SW., Potomac Center, 9th Floor, Washington, DC 20202–4700. Requests may also be electronically mailed to the

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[I.D. 110404C]

Endangered Species; File No. 1510

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Receipt of application.

SUMMARY: Notice is hereby given that the Liberty Science Center (Richard Weddle, Principal Investigator), 251 Phillip Street, Jersey City, New Jersey 07305, has applied in due form for a permit to take shortnose sturgeon (*Acipenser brevirostrum*) for purposes of enhancement through educational display.

DATES: Written, telefaxed, or e-mail comments must be received on or before January 14, 2005.

ADDRESSES: The application and related documents are available for review upon written request or by appointment in the following office(s):

Permits, Conservation and Education Division, Office of Protected Resources, NMFS, 1315 East-West Highway, Room 13705, Silver Spring, MD 20910; phone (301)713–2289; fax (301)713–0376; and

Northeast Region, NMFS, One Blackburn Drive, Gloucester, MA 01930–2298; phone (978)281–9200; fax (978)281–9371.

Written comments or requests for a public hearing on this application should be mailed to the Chief, Permits, Conservation and Education Division, F/PR1, Office of Protected Resources, NMFS, 1315 East-West Highway, Room 13705, Silver Spring, MD 20910. Those individuals requesting a hearing should set forth the specific reasons why a hearing on this particular request would be appropriate.

Comments may also be submitted by facsimile at (301)713–0376, provided the facsimile is confirmed by hard copy submitted by mail and postmarked no later than the closing date of the comment period.

Comments may also be submitted by e-mail. The mailbox address for providing email comments is *NMFS.Pr1Comments@noaa.gov*. Include in the subject line of the e-mail comment the following document identifier: File No. 1510.

FOR FURTHER INFORMATION CONTACT: Jennifer Jefferies or Amy Sloan, (301)713–2289.

SUPPLEMENTARY INFORMATION: The subject permit is requested under the authority of the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 *et seq.*) and the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR 222–226).

The Liberty Science Center proposes to receive and use five captive-bred, non-releaseable shortnose sturgeon for the purpose of educational display. The proposed project of displaying endangered cultured shortnose sturgeon responds directly to a recommendation from the NMFS recovery outline for this species. In addition, the facility would create a public education program and exhibit to increase awareness of the shortnose sturgeon and its status. The proposed project would educate the public on shortnose sturgeon life history and the reasons for its declining numbers.

Dated: December 9, 2004.

Jennifer Skidmore,

Acting Chief, Permits, Conservation and Education Division, Office of Protected Resources, National Marine Fisheries Service.

[FR Doc. 04–27430 Filed 12–14–04; 8:45 am]

BILLING CODE 3510–22–S

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[I.D. 120604A]

Marine Mammals; File No. 87–1593

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Issuance of permit amendment.

SUMMARY: Notice is hereby given that Daniel Costa, Ph.D., University of California, Santa Cruz, Long Marine Lab, 100 Shaffer Road, Santa Cruz, CA 95060, has been issued an amendment to Permit No. 87–1593 conduct scientific research on southern elephant seals (*Mirounga leonina*).

ADDRESSES: The permit and related documents are available for review upon written request or by appointment in the following office(s):

Permits, Conservation and Education Division, Office of Protected Resources, NMFS, 1315 East-West Highway, Room 13705, Silver Spring, MD 20910; phone (301)713–2289; fax (301)713–0376; and

Southwest Region, NMFS, 501 West Ocean Blvd., Suite 4200, Long Beach, CA 90802–4213; phone (562)980–4001; fax (562)980–4018.

FOR FURTHER INFORMATION CONTACT: Amy Sloan or Ruth Johnson, (301)713–2289.

SUPPLEMENTARY INFORMATION: On July 15, 2004, notice was published in the **Federal Register** (69 FR 42424) that a request for a permit amendment to take the species identified above had been submitted by the above-named individual. The requested amendment has been issued under the authority of the Marine Mammal Protection Act of 1972, as amended (16 U.S.C. 1361 *et seq.*), and the Regulations Governing the Taking and Importing of Marine Mammals (50 CFR part 216).

The permit holder is authorized to capture, sedate, tag (flipper and instrument), sample, and release up to 30 adult southern elephant seals; tag and weigh up to 50 immature elephant seals; conduct population censussing; and incidentally disturb up to 100 elephant seals during research. The purpose of this project is to examine the foraging behavior and habitat utilization of the southern elephant seal in the Western Antarctic Peninsula.

In compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), a final determination has been made that the activity proposed is categorically excluded from the requirement to prepare an environmental assessment or environmental impact statement.

Dated: December 8, 2004.

Stephen L. Leathery,

Chief, Permits, Conservation and Education Division, Office of Protected Resources, National Marine Fisheries Service.

[FR Doc. 04–27431 Filed 12–14–04; 8:45 am]

BILLING CODE 3510–22–S

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

[Recommendation 2004–2]

Active Confinement Systems

AGENCY: Defense Nuclear Facilities Safety Board.

ACTION: Notice, recommendation.

SUMMARY: The Defense Nuclear Facilities Safety Board has unanimously approved Recommendation 2004–2, for DOE to consider. Recommendation 2004–2 deals with the confinement of hazardous materials at defense nuclear facilities in the Department of Energy complex.

DATES: Comments, data, views, or arguments concerning the recommendation are due on or before January 14, 2005.

ADDRESSES: Send comments, data, views, or arguments concerning this recommendation to: Defense Nuclear

Facilities Safety Board, 625 Indiana Avenue, NW., Suite 700, Washington, DC 20004–2001.

FOR FURTHER INFORMATION CONTACT: Kenneth M. Pusateri or Andrew L. Thibadeau at the address above or telephone (202) 694–7000.

Dated: December 10, 2004.

A.J. Eggenberger,

Vice Chairman.

Recommendation 2004–2 to the Secretary of Energy, Pursuant to 42 U.S.C. 2286a(a)(5), Atomic Energy Act of 1954, As Amended

Dated: December 7, 2004.

There is a long-standing safety practice in the design, construction, and operation of nuclear facilities to build-in and maintain structures, systems, and components that contain or confine radioactive materials. The Department of Energy (DOE) establishes requirements to ensure such containment or confinement. In the hierarchy of safety controls, passive design features are preferred over active systems; however, controls must be capable of performing their intended function. Passive confinement systems are not necessarily capable of containing hazardous materials with confidence because they allow a quantity of unfiltered air contaminated with radioactive material to be released from an operating nuclear facility following certain accident scenarios. Safety related active confinement ventilation systems will continue to function during an accident, thereby ensuring that radioactive material is captured by filters before it can be released into the environment.

The enclosed technical report, DNFSB/TECH–34, *Confinement of Radioactive Materials at Defense Nuclear Facilities,* compares the benefits of including a safety-related active confinement ventilation system to those of relying only on a passive confinement system. This technical report illustrates that using only a passive confinement system for an existing or new defense nuclear processing facility would not account for many safety considerations such as post-accident monitoring and response, and may result in the release of an undeterminable amount of radioactive materials, the consequences of which could approach that of the unmitigated scenarios.

The Defense Nuclear Facilities Safety Board (Board) has advised DOE in various ways during the past decade regarding the need to pay increased attention to the design and operational reliability of the confinement ventilation systems at defense nuclear facilities. These Board efforts include transmittal of a technical report on May 31, 1995, *Overview of Ventilation Systems at Selected DOE Plutonium Processing and Handling Facilities,* a letter to the Deputy Secretary of Energy dated July 8, 1999, and Recommendation 2000–2, *Configuration Management, Vital Safety Systems,* on March 8, 2000. This advice has helped DOE improve the reliability of its confinement ventilation systems. However, DOE requirements have become less prescriptive during the last decade as DOE Order 6430.1A, *General Design Criteria Manual,* was replaced with DOE Order 420.1, *Facility Safety,* and its subsequent revisions. Furthermore, it has become apparent that the Board's advice on confinement systems is not being rigorously pursued as evidenced by the following:

- On December 27, 2002, the Board sent a letter to the National Nuclear Security Administration (NNSA) regarding the confinement concept used for the Highly Enriched Uranium Materials Facility at the Y–12 National Security Complex. The proposed confinement concept was based on isolating the radioactive material in the building using a passive confinement system under certain abnormal events. The Board communicated safety concerns associated with this concept in the letter; subsequently, the confinement concept for HEUMF was modified to adopt a safety-related active ventilation system.
- On April 12, 2004, the Board sent a letter to the Administrator of NNSA regarding similar safety issues related to the confinement systems for the plutonium facility at the Lawrence Livermore National Laboratory. The proposed approach utilized passive confinement of radioactive material from the facility during certain accident scenarios. Further, because the offsite dose consequences of such an unfiltered release were calculated to be below DOE's evaluation guideline (25 rem), the proposal included downgrading the existing safety-class active confinement ventilation system to a safety-significant system. The Board believed that the new approach was inconsistent with a defense-in-depth philosophy. Subsequently, the Livermore Site Office commissioned an independent calculation of the amount of the unfiltered release. These calculations yielded results that were an order of magnitude greater than the original building leakage estimates—clearly indicating that significant uncertainties existed in the analytical techniques. As a result, NNSA decided to maintain the existing safety-class active confinement ventilation system.
- On August 27, 2004, the Board sent a letter to the Under Secretary of Energy regarding the confinement approach proposed for the Salt Waste Processing Facility at the Savannah River Site. The confinement concept for this new facility is based on isolation of the process building using passive confinement during accident scenarios. The Board suggested that the salt waste facility should be designed with a safety-related active ventilation system.

A number of existing facilities (including the TA–55 Plutonium Facility, the Device Assembly Facility, and the Hanford Evaporator) rely on passive or non-safety related confinement systems. More importantly, designs for proposed facilities (including Chemistry and Metallurgy Research Replacement Facility and the Salt Waste Processing Facility) are based on the same passive confinement concept and use an assumed quantitative value for the building leak path factor as a design criterion.

These examples illustrate two primary concerns. First, a reliance on calculations that do not appropriately account for large uncertainties is not defensible. These analytically determined building leak path factors are based on a combination of several computer programs that were not specifically designed for this purpose. Furthermore, it is generally impossible for these programs to model the true conditions of a real accident because of the uncertain behavior of the workers and emergency crews responding to the event.

Second, these examples represent a fundamental change in DOE's approach to protection of the public near defense nuclear facilities. DOE appears to be using the evaluation guideline of 25 rem exposure at the site boundary as a design criterion and an allowable dose to the public. This is contrary to the Board's July 8, 1999 letter to the Deputy Secretary of Energy that states "the 25 rem evaluation guideline is not to be treated as a design acceptance criterion nor as a justification for nullifying the general design criteria relative to defense-in-depth safety measures." It is also contrary to DOE–STD–3009 that states that the 25 rem evaluation guideline "is not to be treated as a design acceptance criterion." However, the Board continues to see 25 rem at the site boundary used as an acceptance criterion for the performance of confinement systems. The Board is concerned that in these examples DOE and its contractors are underestimating the significance of the performance requirements for a confinement ventilation system and are relying on questionable calculations of offsite doses to evaluate performance. The Board reiterates that the 25 rem evaluation guideline is solely to be used for guidance for the classification of safety controls, and not as an acceptable dose to the public for the purpose of designing or operating defense nuclear facilities.

Notwithstanding the concerns discussed above, DOE continues to pursue a passive confinement approach in the design of some new nuclear facilities that have the potential for a radiological release. The Board recognizes that DOE's defense nuclear complex is comprised of a wide variety of nuclear facilities with an equally diverse range of materials, forms, activities, and proximities to the public. For this reason, it is difficult to prescribe a single, broadly-applicable design requirement. However, in light of the examples discussed above, the Board believes a more prescriptive design requirement is needed.

The Board further recognizes that certain Hazard Category 2 and 3 defense nuclear facilities may not benefit significantly from an active confinement ventilation system. An example would be a facility that stores radioactive material in protected, safety-class containers. Other examples may be certain tritium facilities, outside storage locations, burial grounds, or facilities with planned declining nuclear material inventories and scheduled for decommissioning in the near future. This recommendation is not meant to require an active confinement ventilation system in all such cases.

Therefore, the Board recommends that DOE:

1. Disallow reliance on passive confinement systems and require an active confinement ventilation system for all new and existing Hazard Category 2 defense nuclear facilities with the potential for a

radiological release. These systems are expected to be classified as safety-class or safety-significant as required by a conservative application of DOE-approved methodology, and should be designed and maintained to function during abnormal and accident conditions. Exceptions to such classifications should be approved at a level in DOE that ensures a consistent, conservative approach throughout the complex.

2. Disallow reliance on passive confinement systems and require an active confinement ventilation system for all new and existing Hazard Category 3 defense nuclear facilities with the potential for a radiological release. These systems would not ordinarily be classified as safety-class or safety-significant unless such designation is required by the DOE-approved methodology.

3. Revise all applicable DOE directives pertaining to operation of existing facilities, design and construction of new facilities, and major modifications to existing facilities, in accordance with Items 1 and 2 above. These revisions should include guidance for determining when a facility would not benefit from an active confinement ventilation system.

4. Assess existing facilities, ongoing major modifications, and new design/construction projects, to ensure that:

(a) The confinement strategy described above is implemented, and

(b) The 25 rem evaluation guideline is used solely for classification of safety controls.

Section 42 U.S.C. 2286d(e) provides authority to the Secretary of Energy to "implement any such Recommendation (or part of any such Recommendation) before, on, or after the date on which the Secretary of Energy transmits the implementation plan to the Board under this subsection." The Board suggests that the Secretary of Energy consider taking action on Item 4 above in parallel with the development of an Implementation Plan for this Recommendation.

In addition, the Board's Recommendation 2004–1, *Oversight of Complex, High-Hazard Nuclear Operations,* addresses the need for complex-wide consistency in the application of DOE requirements and expectations. The Board expects the mechanisms established in response to Recommendation 2004–1 would likewise ensure consistent, conservative implementation of the confinement requirement provided here.

John T. Conway,

Chairman.

[FR Doc. 04–27426 Filed 12–14–04; 8:45 am]

BILLING CODE 3670–01–P

DEPARTMENT OF ENERGY

[Docket No. EA–274–A]

Application To Export Electric Energy; Wisconsin Public Service Corporation

AGENCY: Office of Fossil Energy, DOE.

ACTION: Notice of application.

SUMMARY: Wisconsin Public Service Corporation (WPSC) has applied to renew its authority to transmit electric energy from the United States to Canada pursuant to section 202(e) of the Federal Power Act.

DATES: Comments, protests or requests to intervene must be submitted on or before January 14, 2005.

ADDRESSES: Comments, protests or requests to intervene should be addressed as follows: Office of Coal & Power Import/Export (FE–27), Office of Fossil Energy, U.S. Department of Energy, 1000 Independence Avenue, SW., Washington, DC 20585–0350 (FAX 202–287–5736).

FOR FURTHER INFORMATION CONTACT: Xavier Puslowski (Program Office) 202–586–4708 or Michael Skinker (Program Attorney) 202–586–2793.

SUPPLEMENTARY INFORMATION: Exports of electricity from the United States to a foreign country are regulated and require authorization under section 202(e) of the Federal Power Act (FPA) (16 U.S.C. 824a(e)).

On February 6, 2003, the Office of Fossil Energy (FE) of the Department of Energy (DOE) issued Order No. EA–274 authorizing WPSC to transmit electric energy from the United States to Canada as a power marketer. That two year authorization will expire on February 6, 2005.

On November 30, 2004, FE received an application from WPSC to renew its authorization to transmit electric energy from the United States to Canada for a five-year term. WPSC proposes to arrange for the delivery of those exports over the international transmission facilities owned by Basin Electric Power Cooperative, Bonneville Power Administration, Eastern Maine Electric Cooperative, International Transmission Company, Joint Owners of the Highgate Project, Long Sault, Inc., Maine Electric Power Company, Maine Public Service Company, Minnesota Power, Inc., Minnkota Power Cooperative, New York Power Authority, Niagara Mohawk Power Corporation, Northern States Power, Vermont Electric Company and Vermont Electric Transmission Company.

The construction of each of the international transmission facilities to be utilized by WPSC, as more fully described in the application, has previously been authorized by a Presidential permit issued pursuant to Executive Order 10485, as amended.

Procedural Matters: Any person desiring to become a party to these proceedings or to be heard by filing comments or protests to this application should file a petition to intervene, comment or protest at the address provided above in accordance with §§ 385.211 or 385.214 of the FERC's Rules of Practice and Procedures (18 CFR 385.211, 385.214). Fifteen copies of each petition and protest should be filed with the DOE on or before the dates listed above.

Comments on the WPSC application to export electric energy to Canada should be clearly marked with Docket EA–274–A. Additional copies are to be filed directly with Dennis M. Derricks, Director, Regulatory Policy & Analysis, Wisconsin Public Service Corporation, 700 North Adams Street, P.O. Box 19001, Green Bay, WI 54307–9001, *and* David Martin Connelly, Esquire, Bruder, Gentile & Marcoux, L.L.P, 1701 Pennsylvania Avenue, NW., Suite 900, Washington, DC 20006–15807.

Copies of this application will be made available, upon request, for public inspection and copying at the address provided above or by accessing the Fossil Energy Home Page at *http://www.fe.doe.gov.* Upon reaching the Fossil Energy Home page, select "Electricity Regulation," and then "Pending Proceedings" from the options menus.

Issued in Washington, DC, on December 8, 2004.

Anthony J. Como,

Deputy Director, Electric Power Regulation, Office of Fossil Energy.

[FR Doc. 04–27416 Filed 12–14–04; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

Notice of Application for Amendment of License and Soliciting Comments, Motions To Intervene, and Protests

December 9, 2004.

Take notice that the following application has been filed with the Commission and is available for public inspection:

a. *Application Type:* Amendment of License to Reflect Terms and Conditions of Settlement Agreement.

b. *Project No:* 2360–144.

c. *Date Filed:* November 12, 2004.

d. *Applicant:* ALLETE, Inc.

e. *Name of Project:* St. Louis Project.

f. *Location:* The project is located on the St. Louis, Beaver, and Cloquet Rivers in Carlton and St. Louis Counties, Minnesota.

g. *Filed Pursuant to:* Federal Power Act, 16 U.S.C. 791(a) 825(r) and sections 799 and 801.

h. *Applicant Contact:* Ingrid K. Johnson, Assistant General Council,

APPENDIX B
Recommendations Cited

Number	Date	Title
93-6	December 10, 1993	Maintaining Access to Nuclear Weapons Expertise in the Defense Nuclear Facilities Complex
94-1	May 26, 1994	Improved Schedule for Remediation in the Defense Nuclear Facilities Complex
95-2	October 11, 1995	Safety Management
97-2	May 19, 1997	Continuation of Criticality Safety at Defense Nuclear Facilities in the Department of Energy
98-2	September 30, 1998	Safety Management at the Pantex Plant
99-1	August 11, 1999	Safe Storage of Fissionable Material Called “Pits”
2000-1	January 14, 2000	Prioritization for Stabilizing Nuclear Materials
2000-2	March 8, 2000	Configuration Management, Vital Safety Systems
2002-1	September 23, 2002	Quality Assurance for Safety-Related Software
2002-2	October 3, 2002	Weapons Laboratory Support of the Defense Nuclear Complex
2002-3	December 11, 2002	Requirements for the Design, Implementation, and Maintenance of Administrative Controls
2004-1	May 21, 2004	Oversight of Complex, High-Hazard Nuclear Operations
2004-2	December 7, 2004	Active Confinement Systems

APPENDIX C
2004 Reporting Requirements

Date	Subject	Response	Due
December 16	NNSA's draft Request for Proposal for Los Alamos management and operating contract.	Report	20 days
December 15	Continuing tooling problem failures at the Pantex Plant.	Report	30 days
December 14	Safety issues regarding unvented transuranic waste drums at Savannah River Site.	Briefing	30 days
December 14	Long delayed commitments in implementation plan for Recommendation 98-2, safety improvements to nuclear explosive operations.	Briefing	Monthly
November 3	Lack of adequate configuration management program for the highest-hazard nuclear facilities at Lawrence Livermore.	Report	60 days
November 3	Correction of deficiencies prior to increasing the pace of operations and adding new missions at the Device Assembly Facility at the Nevada Test Site.	Report	90 days
October 27	Contractor failure to capture and archive safety-related information for several weapon systems.	Report	90 days
September 27	Safety deficiencies in implementation of nuclear safety requirements at Sandia National Laboratories.	Report Briefing	90 days
September 8	Deficiencies at the activity level of the Hanford tank farm integrated safety management system.	Report	60 days
August 27	Designation of the Salt Waste Processing Facility at the Savannah River Site to ensure confinement of material during earthquakes.	Report	45 days
August 6	Leak areas in nuclear explosive cells at Pantex Plant.	Report Briefing	45 days
August 6	Evaluations of the training and qualification programs at Los Alamos, Lawrence Livermore, and Nevada Test Site. Within 30 days of completion of these evaluations, NNSA representatives brief on corrective action plans.	Evaluation Results Briefing	45 days 30 days
July 29	Uncertainties in design of the Waste Treatment Plant at Hanford, including assessment of the ground motion criteria.	Program Plan	30 day

2004 Reporting Requirements (cont.)

Date	Subject	Response	Due
July 21	Fire protection of structural steel at Waste Treatment Plant at Hanford.	Briefing	30 days
June 18	Quality assurance in tooling program at Pantex Plant.	Report	30 days
May 21	Nuclear safety issues in Technical Area 18 at Los Alamos.	Briefing	45 days
May 14	Inadequate Facility Representative training and staffing.	Report	60 days
May 3	Deficiencies in Basis for Interim Operation at WIPP.	Report	45 days
April 12	Confinement ventilation systems at Lawrence Livermore.	Report	30 days
April 5	Issues and improvements in next year's annual report on nuclear criticality safety.	Report	1 year
April 5	Use of assessment in DOE's oversight and operations at defense nuclear facilities.	Briefing	60 days
April 1	Clarification of the term "site/facility management contractor."	Briefing	15 days
March 24	High-level waste at Savannah River Site.	Briefing	30 days
March 24	Hydrogen hazards of non-Newtonian high-level waste, black cell design concept for the Waste Treatment Plant at Hanford.	Report	60 days
March 23	Fire protection and structural engineering issues at the Waste Treatment Plant at Hanford.	Report	60 days
March 3	Request for revised implementation plan for sludge removal from the K-East and K-West Basins at Hanford.	Revised IP	58 days
February 12	Recommendation 2000-1 implementation plan on accelerated stabilization, repackaging, or disposition of nuclear materials at Los Alamos.	Revised IP	120 days
January 29	DOE response to the Board's comments on the proposed Worker Safety Rule.	Briefing	30 days
January 27	Facility design, good engineering practices at Los Alamos.	Report	90 days
January 22	Request to NNSA to improve nuclear explosive operations and processes.	Report	60 days
January 20	Root-cause analysis of failures at Pantex and commitment for resolution.	Report	30 days

APPENDIX D
CORRESPONDENCE

Hanford Site

March 3 letter to the Secretary of Energy requesting a revised implementation plan and addressing safety issues associated with deteriorating irradiated nuclear fuel in the Hanford K-East Basin with a 58-day reporting requirement.

March 23 letter to the Assistant Secretary for Environmental Management with 60-day reporting requirement regarding Bechtel Nuclear process for developing requirements for fire resistance for structural steel used in the process building at the Waste Treatment Plant.

March 24 letter to the Assistant Secretary for Environmental Management regarding Bechtel Nuclear research and development processes for addressing hydrogen hazards related to non-Newtonian high-level wastes with a 60-day reporting requirement.

June 18 letter to the Secretary of Energy regarding revisions to the implementation plan for the Board's Recommendations 94-1, *Improved Schedule for Remediation in the Defense Nuclear Facilities Complex* and 2000-1, *Prioritization for Stabilizing Nuclear Materials.*

July 21 letter to the Acting Assistant Secretary for Environmental Management regarding proposed reduction of structural steel fire resistance for the Waste Treatment Plant with a 30-day reporting requirement.

July 21 letter to the Acting Assistant Secretary for Environmental Management concerning ventilation system being designed for the Hanford Waste Treatment Plant.

July 29 letter to the Acting Assistant Secretary for Environmental Management regarding ground motion criteria for the Waste Treatment Plant with a 30-day reporting requirement.

August 24 letter to the Acting Assistant Secretary for Environmental Management regarding unresolved issues on the design adequacy of the High-Level Waste Facility structure.

August 26 letter to the Acting Assistant Secretary for Environmental Management forwarding a report on the *Review of Electrical and Instrumentation and Control of the Waste Treatment Plant.*

September 8 letter to the Acting Assistant Secretary for Environmental Management regarding operational events at Hanford Tank Farms and Waste Treatment Plant with a 60-day reporting requirement.

September 29 letter to the Acting Assistant Secretary for Environmental Management forwarding a staff issue report regarding the Waste Treatment Plant Process Engineering.

Los Alamos National Laboratory

January 27 letter to the Administrator, National Nuclear Security Administration, regarding conduct of engineering practices with a 90-day reporting requirement.

February 12 letter to the Secretary of Energy requesting a revised implementation plan for Recommendation 2000-1 with a 120-day reporting requirement.

May 3 letter to the Secretary of Energy regarding the establishment of a "safety basis academy."

May 21 letter to the Administrator, National Nuclear Security Administration, regarding continued safe operations in Technical Area-18 in advance of the relocation of the facility's mission with a 45-day reporting requirement.

May 27 letter to the Administrator, National Nuclear Security Administration, regarding the status of safety bases.

June 22 letter to the Secretary of Energy regarding Ms. Joanne Lorence of Los Alamos Site Office, the Facility Representative of the Year for 2003.

September 13 letter to the Administrator, National Nuclear Security Administration, regarding safety conditions during the shutdown of work activities.

December 16 letter to the Administrator, National Nuclear Security Administration, regarding Request for Proposal for management and operating contract, with a 20-day reporting requirement.

Lawrence Livermore National Laboratory

April 12 letter to the Administrator, National Nuclear Security Administration, with 30-day reporting requirement regarding unfiltered radioactive material released during certain accidents.

November 3 letter to the Secretary of Energy requesting a report within a 60-day period that outlines adequate configuration management.

Nevada Test Site

January 21 letter to the Administrator, National Nuclear Security Administration, regarding the hoisting and rigging operations.

Y-12 National Security Site at Oak Ridge

March 1 letter to the Deputy Administrator for Defense Programs, National Nuclear Security Administration, on electrical system design of the Highly Enriched Uranium Materials Facility.

Pantex Plant

January 20 letter to the Secretary of Energy requesting a comprehensive report with a 30-day reporting requirement documenting a root-cause analysis of failures and commitments for resolution regarding discovery of cracked high explosive during a weapon dismantlement.

June 18 letter to the Administrator, National Nuclear Security Administration, requesting a comprehensive review of quality assurance regarding the tooling program at Pantex Plant with a 30-day reporting requirement.

August 6 letter to the Administrator, National Nuclear Security Administration, regarding potential problems through leak areas in nuclear explosive cells at Pantex Plant with a 45-day reporting requirement.

November 3 to the Administrator, National Nuclear Security Administration, regarding the electrical and lightning protection systems.

December 14 letter to the Secretary of Energy requesting monthly briefings to focus on delays regarding important commitments.

December 15 letter to the Deputy Administrator for Defense Programs, National Nuclear Security Administration, providing a 30-day reporting requirement regarding the inadequacies in the tooling program.

Sandia National Laboratories

October 8 letter to the Administrator, National Nuclear Security Administration, regarding multiple failures of hazard analysis and work control processes.

September 27 letter to the Administrator, National Nuclear Security Administration, requesting a report and briefing in 90 days on the status of safety basis for a nuclear facility.

December 13 letter to the Administrator, National Nuclear Security Administration, regarding the adequacy of safety bases.

Savannah River Site

February 13 letter to the Assistant Secretary for Environmental Management on lightning protection systems for the K-Area Material Storage Facility, FB-Line, and Building 235-F.

March 24 letter to the Assistant Secretary for Environmental Management requesting a plan for the management, processing, and stabilization of high-level waste as well as a contingent plan for accomplishing the process within the 2005 budget with a 30-day response time.

May 14 letter to the Secretary of Energy regarding the nuclear safety consequences of proposed Section 3116 of the National Defense Authorization Act for Fiscal year 2005.

June 18 letter to the Deputy Secretary of Energy regarding the delays and consequences with the management and disposition of radioactive wastes.

August 23 letter to the Acting Assistant Secretary for Environmental Management regarding the electrical and ventilation systems for the high-level waste Concentration, Storage, and Transfer Facilities.

August 27 letter to the Under Secretary of Energy about changing the performance category designation of PC-2 to PC-3 and the plan and schedule for revising the affected directives with a 45-day reporting requirement.

December 13 letter to the Acting Assistant Secretary for Environmental Management regarding the activity-level work planning and control of deactivation and decommissioning activities.

December 14 letter to the Acting Assistant Secretary for Environmental Management regarding the safety hazards of unvented transuranic waste drums with 30-day reporting requirement.

Other Significant Correspondence With DOE

January 22 letter to the Assistant Deputy Administrator, Military Applications and Stockpile Operations, National Nuclear Security Administration requesting a 60-day response time of actions to be taken to address identified shortcomings and enhance the Nuclear Explosive Safety Study.

January 29 letter to the Under Secretary of Energy, Science and Environment establishing a 30-day reporting requirement for a briefing on the plans for addressing the Board's comments on proposed rule 10 CFR Part 851, *Worker Safety and Health*.

January 30 letter to the Assistant Secretary for Environmental Management concerning deactivation and decommissioning activities at defense nuclear facilities.

February 24 letter to the Secretary of Energy regarding suspension of the proposed rulemaking on 10 CFR Part 851 and cancellation of the previously announced public meeting scheduled for February 27, 2004.

February 24 letter to the Departmental Representative forwarding a copy of the Board's Fourteenth Annual Report to Congress.

March 24 letter to the Assistant Secretary for Environment, Safety and Health requesting waivers that DOE had granted to its defense facility contractors to DOE Order 440.1A as mentioned in the testimony at the February 9, 2004 hearing.

March 29 letter to the Departmental Representative forwarding an updated list of Department of Energy Orders of Interest to the Board.

April 1 letter to the Under Secretary of Energy, Science and Environment, regarding issues on the term “site/facility management contractor” with a 15-day response reporting requirement.

April 5 letter to the Secretary of Energy regarding the use of formal risk assessment in its oversight and operations at defense nuclear facilities with a 60-day reporting requirement.

April 5 letter to the Assistant Deputy Administrator for Research, Development, and Simulation, National Nuclear Security Administration, regarding reporting annually on specific issues on the Nuclear Criticality Safety Program.

May 3 letter to the Assistant Secretary for Environmental Management regarding the inadequacies in safety basis, Basis for Interim Operation for the Mobile Waste Characterization and Loading Units for the Central Characterization Project with a 45-day reporting requirement.

May 14 letter to the Secretary of Energy regarding the staffing of Facility Representatives at National Nuclear Security Administration sites with a 60-day reporting requirement.

May 21 letter to the Administrator, National Nuclear Security Administration, regarding effective implementation of ISM into the work planning and control at its various sites.

May 21 letter to the Secretary of Energy forwarding Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations.*

August 6 letter to the Administrator, National Nuclear Security Administration, regarding training and qualification programs at NNSA sites, providing 45 days for evaluation results followed by a briefing within 30 days of the results.

October 27 letter to the Administrator, National Nuclear Security Administration, regarding a program for archiving safety-related activities at the Pantex Plant, the Y-12 National Nuclear Complex, and the Nevada Test Site.

November 3 letter with a 90-day reporting requirement to the Administrator, National Nuclear Security Administration, requesting identification and correction of any deficiencies in the Device Assembly Facility, its equipment, or safety management program.

December 7 letter to the Secretary of Energy forwarding Recommendation 2004-2, *Active Confinement Systems.*

December 14 letter to the Secretary of Energy forwarding the technical report, DNFSB/TECH-35, *Safety Management of Complex, High Hazard Organizations*.

December 22 letter to the Deputy Secretary of Energy regarding DOE Policy 226.1, *Department of Energy Oversight Policy*.

APPENDIX E
ADMINISTRATIVE ACTIVITIES

Human Resources

As of December 31, 2004, the Board employed 90 full-time staff in addition to the five full-time Board Members. The Board continued its aggressive recruitment program to attract the brightest engineering students from colleges and universities across the country, as well as experienced engineering professionals. This year, technical recruiters visited four campus career fairs, and the Board continued its recruitment outreach program.

The Board's ability to fulfill its safety mission rests heavily on attracting and retaining top-caliber technical staff. The Board has succeeded in creating a work environment that emphasizes excellence as the standard for staff performance and has rewarded its staff accordingly. The pay banding and pay for performance programs developed and implemented by the Board have proven to be effective in hiring technical talent, holding employees accountable for their performance, and rewarding outstanding performance on the job. The Board's enabling legislation grants authority for excepted service hiring and classification. Using this authority, along with recruitment and relocation bonuses, student loan repayments, and retention allowances, the Board has been successful in competing for scientific and technical staff in a competitive employment market.

Competition from the private sector and fiscal constraints make recruiting and retaining a high-quality, diverse workforce a challenge. Competition for top engineering professionals is intense. Even with the special hiring and pay authorities granted to the Board, private industry can easily promise higher salaries and benefits. The Board has also found that the federal downsizing campaigns of the 1990s, coupled with the perception that the federal bureaucracy stifles creativity and fails to encourage and reward outstanding work, have damaged its recruiting campaigns. Recruitment and retention of recent college engineering graduates, especially women and minorities, is difficult in the current job market, and will become even more challenging with the renewed activity in the commercial nuclear industry.

Despite these problems, the Board has assembled a professional staff of exceptional technical capability. Staff members' expertise covers all major aspects of nuclear safety: nuclear, mechanical, electrical, chemical, fire protection, and structural engineering, as well as physics and metallurgy. Most mid- to senior-level technical staff members possess practical nuclear experience gained from duty in the United States Navy nuclear propulsion program, the nuclear weapons field, or the civilian nuclear reactor industry. Both the Board and its staff include individuals experienced in environmental impact assessments and regulatory processes. Four of the Board's attorneys have technical degrees, and one is also a licensed professional engineer.

Ten technical staff members are located at priority DOE sites. There are two site representatives at the Pantex Plant near Amarillo, Texas; two at Hanford near Richland, Washington; one at Savannah River Site near Aiken, South Carolina; two at the Y-12 National

Security Complex in Oak Ridge, Tennessee; two at Los Alamos National Laboratory in New Mexico; and one at Lawrence Livermore National Laboratory in Livermore, California.

The Board expects its engineers and scientists to maintain the highest level of technical knowledge, encouraging them to improve their skills continually through academic study. Ninety-three percent of the Board's senior technical staff holds advanced science and engineering degrees, with 23 percent at the Ph.D. level. Younger technical staff members have been recruited through the Board's professional development program. Entry-level employees recruited into this 3-year program receive graduate-school education and intensive on-the-job training guided by experienced technical mentors. Currently, there are eight entry-level employees in this program. Three completed their master's degrees in the summer of 2004 and are in their third-year field assignment. By the summer of 2005, three more of these individuals should be awarded a master's degree in an engineering discipline. The Board's professional development program remains extremely useful in attracting and retaining high-quality, entry-level engineers and preparing them for challenging assignments in their fields.

Information Technology and Security

The Board has continued to increase its use of advanced information technology. Desktop hardware, software, and network servers provided to the staff are continually upgraded to ensure that the latest tools are available. In 2004, the Board completed a "technology refresh program" and upgraded all of the Board's desktop computers to a standard configuration. Use of a standard configuration significantly improves computer security and streamlines operational support requirements. The Board's internet website (www.dnfsb.gov) is kept current to ensure that public documents are available for viewing and downloading. A Google®-style search engine for the website has been purchased and is currently being tested. When implemented, the search engine will improve the public's access to the Board's documents.

Dispute Resolution Programs

The Board, like other federal agencies, is required by the Administrative Dispute Resolution Act of 1996 to provide an alternative dispute resolution program for use in resolving appropriate disputes. The Board maintains such a program, making use of cooperative agreements with other agencies to resolve workplace and contracts disputes economically.

APPENDIX F
Acronyms and Abbreviations

Board	Defense Nuclear Facilities Safety Board
CFR	Code of Federal Regulations
CPP	Chemical Processing Plant
D&D	Deactivation and Decommissioning
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DST	Double Shell Tank
FOIA	Freedom of Information Act
FY	Fiscal Year
ISM	Integrated Safety Management
KAMS	K-Area Material Storage
NNSA	National Nuclear Security Administration
Ph.D.	Philosophiae Doctor
PDF	Portable Document Format
QA	Quality Assurance
U.S.C.	United States Code
WIPP	Waste Isolation Pilot Plant
Y-12	Y-12 National Security Complex