DEFENSE NUCLEAR FACILITIES SAFETY BOARD

FY 2007 PERFORMANCE AND ACCOUNTABILITY REPORT

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Chairman's Message

On behalf of the Members and staff of the Defense Nuclear Facilities Safety Board (Board), I am pleased to submit our *Performance and Accountability Report* (PAR) for FY 2007.

The primary purpose of the Board is to ensure adequate public health and safety and to prevent failed programs and devastating accidents from becoming a reality in the Department of Energy's (DOE) defense nuclear facilities. For example, the Board was instrumental in identifying and addressing serious design and construction errors associated with DOE's Waste Treatment Plant, which is being constructed at the Hanford Site in Washington State to treat the high level waste that is currently stored in 177 aging tanks. Similarly, the Board provides a key component of the oversight that prevents an accidental detonation of a nuclear weapon during the evaluation, maintenance, or dismantlement process. Such an accident could result in catastrophic impacts on lives and property, as well as cripple our Nation's nuclear deterrent capability. The Board is the last line of defense in preventing serious safety vulnerabilities and tragic accidents from occurring in very complex and dangerous DOE defense nuclear facilities.

During FY 2007, the Board continued to make significant progress in ensuring the safety of the public and the workers at or near DOE defense nuclear facilities. Considering that the Board is a small agency (less than 100 FTEs) with new budget authority of $21.9 million in FY 2007, I am proud to recognize the sustained and dedicated effort of our staff. The detailed performance reports that appear later in this document attests to the accomplishments of this small, but highly talented team. Given the scope and significance of our health and safety oversight responsibilities, the performance accomplishments far exceed the level of resources invested.

The Board is committed to ensuring that the public resources in our trust are well-managed and wisely used. Office of Management and Budget Circular A-136 requires an assessment of the completeness and reliability of the program performance and financial data contained in this report. I conclude that the data are complete and reliable. In addition, the Circular requires an assessment of internal controls with a separate assessment required for internal controls related to the Federal Managers' Financial Integrity Act (FMFIA). Based on personal observation and reasonable assurances provided by internal managers, I believe that no material internal control weaknesses, with the exception of the one related to FMFIA (reference page 16 under the Management Discussion and Analysis chapter), exist.

The future holds many managerial challenges for the Board, both in terms of technically complex health and safety issues involving the disassembly, refurbishing, reassembly, and re-certifying of nuclear weapons and components, the acceleration of stabilization and clean-up work at many defense nuclear sites, and high-visibility decommissioning activities; as well the review of new DOE defense nuclear facilities in the critical design and construction phases. Moreover, the human capital issues will become critical to the viability of future Board operations.

The Board remains committed to improving DOE's management of the safety, security, and reliability at our Country's most sensitive defense nuclear facilities where our nuclear arsenal is maintained, and where hazardous nuclear materials and components are stored in more secure and stable configurations. Our standard of excellence in carrying out this important mission will mirror the best of American excellence, values, and ideals. Our Nation deserves nothing less.

A.J. Eggenberger, Chairman

November 15, 2007

Chapter 1
Management's Discussion and Analysis

INTRODUCTION

This Performance and Accountability Report (PAR) summarizes the Defense Nuclear Facilities Safety Board's (Board) oversight activities and associated resource expenditures for the period from October 1, 2006 through September 30, 2007 (FY 2007). This report was prepared pursuant to the requirements of the Accountability of Tax Dollars Act of 2002 and Office of Management and Budget (OMB) Circular A-136, which provides instructions on the preparation of PAR reports. Fiscal year 2007 is the fourth year that the Board has prepared and published a PAR report.

The Government Performance and Results Act of 1993 (GPRA) requires each agency to prepare and submit a strategic plan establishing long-term programmatic, policy, and management goals. The Defense Nuclear Facilities Safety Board *Strategic Plan for FY 2003-2009* is available on the Internet at www.dnfsb.gov. In addition, agencies are also required to develop a performance budget with annual performance objectives that indicate the progress toward achievement of the strategic plan's goals and objectives. The Board performance objectives for FY 2008 and FY 2009, as well as representative accomplishments for FY 2004 through 2007, will be included in its *FY 2009 Budget Request to the Congress* in accordance with the requirements of OMB Circular A-11. The final GPRA requirement to submit an annual performance report is satisfied by this PAR.

Chapter 1, *Management Discussion and Analysis*, provides an overview of Board operations, and is divided into five sections: *About the Board* describes the agency's mission, organization structure, and the four major performance goals of the Defense Nuclear Facilities Safety Board; *Future Challenges* includes a review of upcoming issues; *Program Performance Overview* discusses the Board's success in accomplishing its performance goals; *Financial Performance Overview* provides highlights of Board's financial position and audit results; and *Systems, Controls, and Legal Compliance* describe the agency's compliance with key legal requirements such as the Federal Information Security Management Act (FISMA) and internal controls.

ABOUT THE DEFENSE NUCLEAR FACILITIES SAFETY BOARD

The Board, an independent executive branch agency, is charged with providing technical safety oversight of the Department of Energy's (DOE) defense nuclear facilities and activities in order to protect the health and safety of the public and workers. Congress established the Board in September 1988 in response to growing concerns about the level of health and safety protection that DOE was providing the public and workers at defense nuclear facilities. In so doing, Congress sought to provide the public with added assurance that the defense nuclear facilities required to maintain the nation's nuclear weapons stockpile are being safely designed, constructed, operated, and decommissioned. The Board commenced operations in October 1989 with the Senate confirmation of the first five Board Members.

Organization

The Board is headed by five full-time Board Members who, by statute, must be respected experts in the field of nuclear safety with demonstrated competence and knowledge relative to independent investigations and oversight. Two members of the Board are designated by the President to serve as Chairman and Vice Chairman. Each Board Member is appointed by the President, with the advice and consent of the Senate, and serves a term of five years. The Chairman serves as the Chief Executive Officer of the Board.

The Board headquarters facility is located in downtown Washington, D.C., in proximity to the DOE headquarters facility. Our headquarters location was selected to facilitate the interface between Board and DOE management officials and staff, and has proven to be beneficial for the timely exchange of information as the Board conducts its independent oversight mission.

The Board maintains on-site safety oversight of defense nuclear facilities by assigning experienced technical staff members to full-time duty at priority DOE defense nuclear sites. As of September 30, 2007, nine full–time site representatives were stationed at the following DOE sites:

- Pantex Plant
- Hanford Site
- Savannah River Site (SRS)
- Y-12 National Security Complex
- Los Alamos National Laboratory (LANL)

The Site Representative Program provides a cost-effective means for the Board to closely monitor DOE activities, and to identify health and safety concerns promptly by having on-site staff conducting firsthand assessments of nuclear safety management at the priority sites to which they have been assigned. Site representatives regularly interact with the public, union members, congressional staff members, and public officials from federal, state, and local agencies.

The Board's budget authority for FY 2007 was $21.9 million supporting 100 full-time equivalent staff. The Board's health and safety oversight activities are funded exclusively from a direct appropriation included in the annual Energy and Water Development Appropriation Act. No other cost recovery mechanisms such as fees, annual charges, or reimbursement from the DOE are authorized for the Board.

Safety Oversight Responsibilities

The Board's specific duties and responsibilities to protect the health and safety of the public and the workers at DOE's defense nuclear facilities are delineated in its enabling statute, 42 U.S.C. § 2286, *et seq.*, which states:

- The Board shall review and evaluate the content and implementation of the standards relating to the design, construction, operation, and decommissioning of defense nuclear facilities of the Department of Energy (including all applicable Department of Energy orders, regulations, and requirements) at each Department of Energy defense nuclear facility. The Board shall recommend to the Secretary of

Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected. The Board shall include in its recommendations necessary changes in the content and implementation of such standards, as well as matters on which additional data or additional research is needed.

- The Board shall investigate any event or practice at a Department of Energy defense nuclear facility which the Board determines has adversely affected, or may adversely affect, public health and safety.

- The Board shall have access to and may systematically analyze design and operational data, including safety analysis reports, from any Department of Energy defense nuclear facility.

- The Board shall review the design of a new Department of Energy defense nuclear facility before construction of such facility begins and shall recommend to the Secretary, within a reasonable time, such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety. During the construction of any such facility, the Board shall periodically review and monitor the construction and shall submit to the Secretary, within a reasonable time, such recommendations relating to the construction of that facility as the Board considers necessary to ensure adequate protection of public health and safety. An action of the Board, or a failure to act, under this paragraph may not delay or prevent the Secretary of Energy from carrying out the construction of such a facility.

- The Board shall make such recommendations to the Secretary of Energy with respect to Department of Energy defense nuclear facilities, including operations of such facilities, standards, and research needs, as the Board determines are necessary to ensure adequate protection of public health and safety. In making its recommendations, the Board shall consider the technical and economic feasibility of implementing the recommended measures.

In support of this mission, the Board has identified the following four interdependent, strategic areas of concentration and has organized its technical staff according to these strategic areas:

AREA 1. **NUCLEAR WEAPON OPERATIONS**: DOE operations that directly support the nuclear stockpile and defense nuclear research.

AREA 2. **NUCLEAR MATERIAL PROCESSING AND STABILIZATION:** The processing, stabilization, and disposition of DOE defense nuclear materials and facilities.

AREA 3. **NUCLEAR FACILITIES DESIGN AND INFRASTRUCTURE:** The design and construction of new DOE defense nuclear facilities, and major modifications to existing facilities.

AREA 4. **NUCLEAR SAFETY PROGRAMS AND ANALYSIS:** The development, implementation, and maintenance of DOE regulations, requirements, and guidance affecting public or worker health and safety; and the establishment and implementation of safety programs at DOE defense nuclear facilities.

The FY 2007 performance goals and accomplishments associated with each of these areas of concentration will be discussed further in Chapter 2 of this report.

FUTURE CHALLENGES

The Board is facing a number of significant challenges that impact the accomplishment of its independent health and safety oversight mission. In addition to conducting nuclear safety oversight of hundreds of existing defense nuclear operations, the Board is obligated by law to conduct in-depth reviews of new defense nuclear facilities during design, construction, and operations. DOE has more than 25 design and construction or major modification projects currently underway or planned for the near future at an estimated value of more than $20 billion.

Second, DOE's nuclear weapon stockpile stewardship and management operations require particular Board oversight attention due to the hazards associated with the nuclear explosive activities and experiments involving collocated high explosives and nuclear material. The Board is especially sensitive to the safety risks due to the potential for explosive dispersal of radioactive materials or inadvertent nuclear detonation.

Third, one of the most significant challenges facing DOE is in the arena of nuclear materials processing and stabilization, such as managing the high-level waste (HLW) stored in underground tanks at various defense nuclear sites, including the Savannah River Site (SRS). The Board has spent a great deal of effort providing oversight of HLW systems at sites such as SRS and plans to continue to do so.

A fourth challenge is maintaining a determined, focused, and well-executed human capital program within the Board. Because the Board's health and safety recommendations and other advisories to the Secretary of Energy are based on in-depth technical information and detailed safety analyses, the recruitment and retention of scientific and technical staff members with outstanding qualifications continue to be critical to the successful accomplishment of the Board's mission. The loss of technical competence due to retirements and other reasons must be countered with an aggressive recruiting campaign for new engineering talent at all levels including entry level engineers.

Oversight of New DOE Design and Construction Projects

The Board is required by law to review the design and construction of projects to ensure the safety of the public and workers is addressed early in the design process. The Board will continue to expend considerable resources to review the ongoing design effort as well as the construction activities at new DOE defense nuclear facilities.

DOE has more than 25 design and construction or major modification projects currently underway at an estimated value of more than $20 billion. The Board plans to concentrate its oversight attention on the projects with high risk, significance, and complexity.

One prominent example of a high-risk, new facility undergoing both design and construction is the Waste Treatment Plant (WTP) in Richland, Washington. The WTP project consists of three major nuclear facilities to pretreat and vitrify high-level waste stored in underground tanks at Hanford. This project, now estimated to cost in excess of $12 Billion. The WTP is a complex, high-risk program that has constantly changing design and construction parameters, will require more than 15 years to complete, and will operate for decades.

The design and construction reviews conducted by the Board on WTP and other new DOE facilities are resource intensive and time consuming, but are key to preventing safety flaws in design and construction that could render a newly constructed facility unusable.

One of the dominant potential accidents at all defense nuclear facilities, both new and existing, is a major fire. The Board must provide constant oversight and vigilance in the area of fire protection detection and suppression systems to ensure these key safety controls are designed, installed, and maintained correctly.

Safety of Nuclear Weapon Activities

To maintain the Nation's nuclear deterrent without the design of new weapons and the underground testing of existing weapons, DOE is accelerating its programs to extend the life of weapons in the enduring stockpile, requiring more and increasingly complex operations to disassemble, refurbish, reassemble, and re-certify nuclear weapons and components. DOE's nuclear weapons stockpile stewardship and management operations require particular oversight attention due to the hazards associated with the nuclear explosive activities and experiments involving co-located high explosives and nuclear material. In addition to the criticality safety concerns, the Board is especially sensitive to the safety risks due to the potential for explosive dispersal of radioactive materials or inadvertent nuclear detonation.

A unique and particularly devastating potential accident in the nuclear weapons complex would involve an inadvertent nuclear detonation at the Pantex Plant during nuclear explosive operations, or at the Nevada Test Site (NTS) while working on a damaged nuclear weapon or an improvised nuclear device.

It is anticipated that the increased operational tempo of nuclear explosive operations at the Pantex Plant would also continue to increase due to pressure to dismantle our retired nuclear weapons as we draw down our nuclear weapons stockpile. In response to Congressional oversight and criticism, DOE has begun implementing plans to further increase throughput in the weapons complex.

In addition to the increased operational tempo at the Pantex Plant, production operations at the Y-12 National Security Complex will have to continue to provide essential support to the enduring stockpile. The old defense nuclear facilities at Y-12 are particularly in need of replacement, and significant effort on the part of the Board is required to oversee the safety of the challenging task of operating aging facilities at a high tempo while designing, constructing, and making the transition to modern replacement facilities.

Nuclear Materials Processing and Stabilization

One of the most significant challenges facing DOE in the arena of nuclear materials processing and stabilization is managing the high-level waste (HLW) stored in underground tanks at the Savannah River Site (SRS). The Board has spent a great deal of effort providing oversight of the SRS HLW system and plans to continue to do so. DOE stores more than 34 million gallons of HLW in 49 HLW tanks at SRS, and the aging systems within the tank farms and the shrinking volume of free space in the tanks pose significant health and safety risks for DOE and its contractor. DOE plans to separate HLW liquids, salts, and sludge, treat each waste stream, and stabilize the waste for packaging and final disposal. This is a complex and hazardous process and requires DOE to work closely with many local and national regulators and stakeholders.

The Board has issued several letters and Recommendations regarding the HLW system at SRS, including Recommendation 2001-1, *High-Level Waste Management at the Savannah River Site*, which is still open and active. On this topic, the Board has interacted closely with DOE, the SRS contractor, the State of South Carolina, and the appropriate committees of the U.S. Senate and House of Representatives.

The Board's oversight is expected to encompass a wide variety of technical safety issues related to the chemical treatment of wastes and to the design, construction, and operation of waste treatment facilities. Examples of these technical safety issues include:

- targeted retrieval of low-curie salt waste from HLW tanks without adding excess dissolution water to the HLW system,
- modifications to and subsequent operation of the Saltstone Disposal Facility for disposal of low-curie salt wastes,
- treatment of unique organic compounds and HLW in Tank 48,
- design, construction and operation of the Salt Waste Processing Facility, which would serve to treat the bulk of the HLW in the SRS Tank Farms,
- coordinated operation of HLW evaporators to avoid introduction of incompatible waste forms to an evaporator,
- coordinated sludge washing and retrieval to maintain a feed stream to the Defense Waste Processing Facility (DWPF),
- assuring adequate tank space to accommodate recycle water from the DWPF, and
- final cleanout and closure of the HLW tanks.

Human Capital - The Board's Greatest Asset

Sixty-four percent of the Board's FY 2007 obligations were dedicated to salaries and benefits for its staff and Board Members. The Board must function as an oversight organization comprised of leading technical experts who quickly recognize problems in the hundreds of hazardous operations conducted daily throughout the DOE defense nuclear complex. The Board relies on a determined, focused, and well-executed human capital program that uses all available tools to attract and retain the technical talent necessary to accomplish the Board's congressionally mandated mission. After years of experience, the Board has determined that its technical staff requires scientists and engineers with extensive backgrounds in technical disciplines such as nuclear-chemical processing; conduct of operations; general nuclear safety analysis; conventional and nuclear explosive technology and safety; nuclear weapons safety; storage of nuclear materials; nuclear criticality safety; and waste management. The technical personnel all have technical master's degrees, and approximately 20 percent have doctoral degrees. Because the Board's health and safety recommendations and other advisories to the Secretary of Energy are based on in-depth technical information and detailed safety analyses, recruitment and retention of scientific and technical staff members with outstanding qualifications continues to be critical to successful accomplishment of the Board's mission.

During FY 2007, the Board successfully hired up to almost 100% of its current authorized staffing level of 100 positions after starting the year with nine technical staff vacancies. Ten engineers were hired, of whom eight were on board before the end of the fiscal year. All five Board Member positions are filled. The Board lost six staff members to retirement or attrition.

Building on its hiring successes of 2007, the Board will continue its aggressive approach to reach out to mid-career and senior-level scientists and engineers. The combination of an aging workforce and high demand for experienced scientists and engineers by other organizations will impact Board operations if not dealt with in an aggressive manner. Twenty percent of the Board's technical staff is eligible for regular retirement today. Competition for scientists and engineers with the Board's required expertise continues to be very stiff due to the expected growth of nuclear power generating capacity in the near future, the consequent need for increased technical expertise by the Nuclear Regulatory Commission, the Department of Defense's emphasis on combating weapons of mass destruction, and DOE's nuclear weapons complex activities. Consequently, the Board expects recruiting of highly qualified technical personnel will continue in a highly competitive job market.

The Board will continue its highly competitive three-year Professional Development Program (PDP), which brings entry-level technical talent into professional positions within the Board straight from college. Through a technical mentor, individuals are provided a series of individually tailored developmental assignments, formal academic schooling, and a one-year, hands-on field assignment. In FY 2007, the Board set a goal to recruit two personnel into the PDP each year, allowing up to six PDP personnel in the program at any one time. The Board accomplished this annual goal by hiring two PDP personnel in FY 2007, in addition to having a summer hire that has been offered a PDP position for FY 2008.

PROGRAM PERFORMANCE OVERVIEW

In establishing the Board, Congress chose to establish an independent external oversight organization composed of technical experts in the field of nuclear health and safety. Therefore, the Board was given specific oversight and advisory powers, as opposed to being an independent regulator of the DOE defense nuclear complex. In view of the Board's enabling legislation and specific mission, the Board must focus its expertise and limited resources on one goal:

The Board will assist DOE in improving safety at existing and proposed defense nuclear facilities by identifying health and safety issues affecting the public and the workers, recommending actions to address these issues, and ensuring that corrective actions are completed.

To achieve this general goal, the Board has identified the following four interdependent, strategic areas of concentration and has developed performance goals and outcome objectives for each:

AREA 1. NUCLEAR WEAPON OPERATIONS

Performance Goal: DOE operations that directly support the nuclear stockpile and defense nuclear research are conducted in a manner that ensures adequate protection of the health and safety of the workers and the public.

Stockpile management is the term used to describe the industrial aspects of maintaining the U.S. nuclear weapon's stockpile and complex. Board oversight activities for this strategic area focus on assuring that current and planned operations at the Pantex Plant in Texas, the Y-12 National Security Complexes in Tennessee, and tritium operations at the Savannah River Site in South Carolina are accomplished safely according to approved standards.

Also included in this strategic area is the DOE Stockpile Stewardship Program, which refers to activities carried out by DOE to ensure confidence in the safety, security, and reliability of nuclear weapons in the stockpile, in the absence of underground nuclear weapons testing. The Board's oversight of the stockpile stewardship program is centered on assuring the safety of the research, development, manufacturing, and testing activities conducted at the Los Alamos National Laboratory in New Mexico, the Lawrence Livermore National Laboratory in California, the Nevada Test Site, and Sandia National Laboratories in New Mexico and California.

Outcome: DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the Board and the facilities are operated to approved safety standards, rules, orders, and directives. Follow-up technical evaluations of DOE's nuclear stockpile activities will verify necessary improvements in safety.

AREA 2. NUCLEAR MATERIAL PROCESSING AND STABILIZATION

Performance Goal: The processing, stabilization, and disposition of DOE defense nuclear materials and facilities are performed in a manner that ensures adequate protection of the health and safety of the workers and the public.

With the shutdown of major weapon production activities at defense nuclear facilities in the early 1990s, substantial quantities of plutonium, uranium, transuranic isotopes, and irradiated fuel have remained in storage for extended periods under potentially unsafe and deteriorating conditions. The Board's focus in this strategic area is to aid DOE in identifying these excess materials and in reviewing DOE's plans/programs to stabilize the materials and place them in a safe configuration for storage pending future programmatic use or disposition.

Board oversight in this area includes the retrieval, stabilization, and safe interim storage of spent nuclear fuel and sludges in the K-Basin at the Hanford Site in Washington, the Savannah River Site, and the Idaho National Laboratory. The Board exercises oversight of the nuclear waste programs conducted at the Savannah River and Hanford sites, as well as the Waste Isolation Pilot Plant (WIPP) in New Mexico and the Idaho National Laboratory. The Board will also provide health and safety oversight of DOE programs to safely deactivate and decommission facilities at the Hanford and Savannah River Sites, the Idaho National Laboratory, the Y-12 National Security Complex in Tennessee, the Mound Sites in Ohio, and the Los Alamos and Lawrence Livermore National Laboratories in New Mexico and California.

Outcome: DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the Board. Follow-up technical evaluations of DOE's nuclear materials management and facility disposition activities will verify necessary improvements in safety, as DOE meets its commitments to the Board to stabilize and dispose of hazardous nuclear materials.

AREA 3. NUCLEAR FACILITIES DESIGN AND INFRASTRUCTURE

Performance Goal: New DOE defense nuclear facilities, and major modifications to existing facilities, are designed and constructed in a manner that ensures adequate protection of the health and safety of the workers and the public.

To ensure that safety is addressed early in the process, the Board reviews the design and construction of new DOE defense nuclear facilities. These facilities must be designed and constructed in a manner that will support safe and efficient operations for 20 to 50 years. This requires a robust design process that will ensure appropriate safety controls are identified and properly implemented early in the process. The Board's expectation is that the design and construction phases of defense nuclear facilities will be accomplished under approved nuclear codes and standards, and demonstrate clear and deliberate implementation of Integrated Safety Management (ISM) principles and core functions.

The Board's reviews of the design and construction of major facilities and projects in this strategic area are resource intensive and time consuming, but they result in significant safety improvements. In recent years, there has been an increase in the number of new DOE projects, with more than 25 projects in the design and construction phase. Examples of these new projects include the Integrated Waste Treatment Unit, currently in the design stage at the Idaho National Laboratory; the Hanford Waste Treatment Plant, which is in the construction phase; the Highly Enriched Uranium Materials Facility, which is in the construction phase at the Y-12

National Security Complex; the Chemistry and Metallurgy Research Replacement Facility, which is in both the design and construction phases at the Los Alamos National Laboratory; and the Pit Disassembly and Conversion Facility, which is in the design stage at the Savannah River Site.

Outcome: DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the Board. Follow-up technical evaluations will verify necessary safety improvements in the design and construction of DOE's new nuclear facilities and major modifications to existing facilities. New nuclear facility designs will meet acceptable safety standards.

AREA 4. NUCLEAR SAFETY PROGRAMS AND ANALYSIS

Performance Goal: DOE regulations, requirements, and guidance are developed, implemented, and maintained; and safety programs at defense nuclear facilities are established and implemented as necessary to protect adequately the health and safety of the workers and the public.

The Board's oversight effort in this area focuses on issues where a complex-wide perspective on health and safety issues is required to identify and correct generic health and safety problems. Under the aegis of Integrated Safety Management (ISM),[1] significant resources are applied to areas such as the technical competence of DOE's Federal workforce, the efficiency of DOE's line management and safety oversight, and the development and implementation of ISM systems with particular focus on safety analyses and controls. Key supporting functional areas are also reviewed, such as quality assurance, nuclear criticality safety, and training and qualifications.

The Board's reviews in this strategic area often build on data collected at the field level in the first three areas, integrating and analyzing the results to feed back key information that can be used to direct safety program improvement across multiple management lines. For example, at the Board's urging, DOE issued a quality assurance improvement plan to strengthen the implementation of existing quality requirements for safety-related components and systems. Similarly, the Board continues its efforts to ensure that DOE maintains a vigorous nuclear criticality safety infrastructure to support nuclear operations. The Board has been instrumental in driving recent DOE efforts to verify that vital safety systems have been identified throughout the defense nuclear complex and that their condition is understood and controlled.

[1] Integrated Safety Management (ISM) is the means by which the Department of Energy is institutionalizing the process of incorporating into the planning and execution of every major defense nuclear activity those controls necessary to ensure that environment, safety, and health objectives are achieved.

Outcome: DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the Board. In addition, follow-up technical evaluation of DOE's safety programs at defense nuclear facilities will verify necessary improvements in safety, and effective implementation of Integrated Safety Management principles.

Interdependency of the Four Performance Goals:

The interdependence of these four strategic areas of concentration must be understood to appreciate the efficiency of the Board's operating plan and corresponding organizational alignment. The "lessons learned" from the Board's health and safety oversight activities cut across each of these four areas. Health and safety hazards identified in Nuclear Material Processing and Stabilization (Area 2) must be transferred to the Nuclear Weapon Operations (Area 1) to avoid or mitigate new remediation issues before they happen. Likewise, the lessons learned from Nuclear Facilities Design and Infrastructure (Area 3) must be shared with managers responsible for preparing and enforcing health and safety-related guidance, requirements, and regulations in Nuclear Safety Programs and Analysis (Area 4).

For example, in order to oversee safety at the Y-12 National Security Complex, the Board must assess the safety of hazardous activities that support the nuclear weapons stockpile (Area 1). To accomplish its general goal, the Board must also assess processing and stabilization of nuclear materials to support facility deactivation, such as Building 9206 (Area 2), construction of new defense nuclear facilities such as the Highly Enriched Uranium Materials Facility (Area 3), and implementation of important safety programs such as nuclear criticality safety (Area 4).

Another example of the interdependence of the four strategic areas of concentration is the safety oversight of the Savannah River Site. At this site, the Board must evaluate not only the safety of nuclear material processing and stabilization activities such as disposing of high level waste (Area 2), but also the safety of nuclear weapon support activities involving tritium operations (Area 1), the construction of new defense nuclear facilities such as the Pit Disassembly and Conversion Facility (Area 3), and nuclear safety programs such as high level waste tank integrity inspections (Area 4).

As discussed in Strategic Area 3 above, DOE is designing and constructing many new defense nuclear facilities that will be used to support the nuclear weapon operations and/or nuclear material processing and stabilization. To ensure that DOE protects the health and safety of the public and the workers, the Board must pay close attention to the design, construction, start-up and operation of these facilities, as well as major modifications to existing facilities, including the selection of governing safety standards and requirements.

Equally important, the Board evaluates the directives, standards, and programs governing DOE's safe performance of its hazardous defense nuclear activities. The Board's first three strategic areas of concentration heavily rely upon the implementation of specific DOE rules and directives. The Board's integrated, comprehensive oversight of the safety of DOE's defense nuclear facilities requires that the Board carefully evaluate these safety programs.

The synergy gained from constant information-sharing among the Board's matrixed staff, which supports all four strategic areas of concentration, is key to achieving the Board's general goal.

The Board's technical staff has been organized specifically to achieve the agency's performance goals and to execute its Strategic Plan and Annual Performance Plans. Using a matrix form of organization, the Board gains management flexibility and avoids the need to establish layers of middle management that divert limited staff resources from performing health and safety reviews. Four interdependent technical groups, staffed with technical specialists having both the education and work experience commensurate with the designated oversight assignments, have been created, each with direct responsibility for achieving one of the four strategic performance goals described in this plan. Depending on the urgency of the issue, the Board may reassign resources among these groups as necessary.

FINANCIAL PERFORMANCE OVERVIEW

As of September 30, 2007, the Board had adequate internal controls to conduct its health and safety oversight mission and to ensure that obligations did not exceed its total budget authority. As with many small agencies, the Board has adopted the "economies of scale" philosophy for obtaining needed administrative support services. For financial support, the Board has negotiated interagency agreements with the Bureau of Public Debt and the National Finance Center for personnel/payroll services, and the General Services Administration's (GSA) Heartland Finance Center for accounting services on a fee-for-service basis. The Board's financial statements were prepared in accordance with the accounting standards codified in the Statements of Federal Financial Accounting Standards (SFFAS) and OMB Circular A-136, *Financial Reporting Requirements*.

Sources of Funds

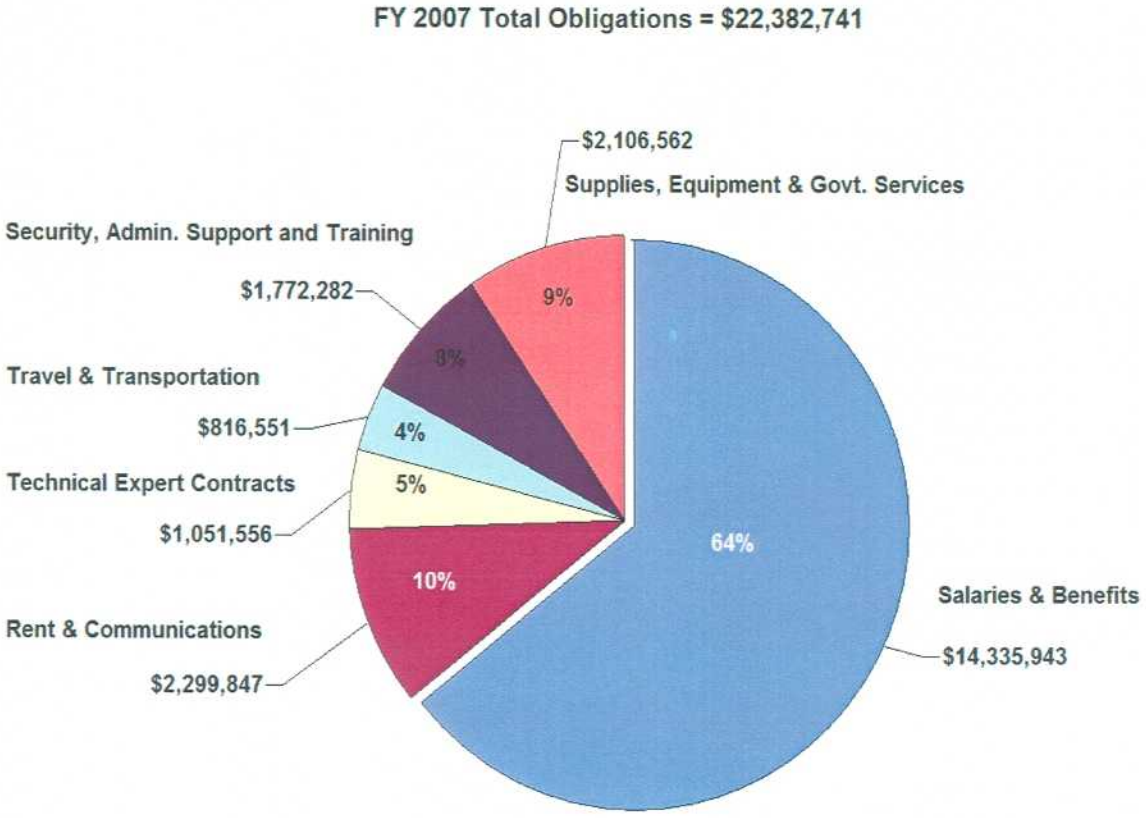
The Board receives an annual appropriation, for Salaries and Expenses, with the funds made available until expended. The sources of funds available for obligation in FY 2007 and FY 2006 are listed as follows:

	FY 2007	FY 2006
New Budget Authority	$21,914,054	$21,811,680
Prior Year Unobligated Balance	3,443,743	1,389,721
Recovery of Prior Year Obligations & Offsetting Collections	975,835	687,412
Total Budgetary Resources	**$26,333,632**	**$23,888,813**

The Board has no reimbursable work for others authority, and is not authorized to collect fees or charges for its oversight services conducted at DOE defense nuclear facilities.

Uses of Funds by Function

The Board incurred obligations of $22,382,741 in FY 2007. As shown on the chart on the following page, the FY 2007 budget was used primarily to pay the salaries and benefits of our employees, with most of the remaining resources dedicated to the logistical support of the five Board Members and employees as they conducted oversight operations.



AUDIT RESULTS

The Board received an unqualified audit opinion on its FY 2007 financial statements. The auditors disclosed no instances of noncompliance with laws and regulations and identified one material weakness concerning internal control over information systems. The material weakness was also identified (as a reportable condition) in FY 2006. Although Board made progress in addressing this issue in FY 2007 as recognized by the auditors, more remains to be done, and the agency will continue to implement corrective action in FY 2008.

The Board is pleased to report that its one instance of noncompliance with laws and regulations (the Federal Managers' Financial Integrity Act) identified in the prior-year compliance report was not a repeat finding based on corrective actions taken by the Board during FY 2007.

A copy of the full audit report as provided to the Board, as well as a discussion of problems identified as a result of this audit and actions by Board management to address the auditor's findings and recommendations, can be found in Chapter 3 of this PAR.

FINANCIAL STATEMENT HIGHLIGHTS

The Board's financial statements summarize the financial activity and financial position of the agency. The financial statements, footnotes, and required supplemental information appear in Chapter 3, *Auditors' Reports and Financial Statements*. Analysis of the principal statements follows:

Analysis of the Balance Sheet

	FY 2007	FY 2006
Total Assets	$9,858,038	$8,731,380
Total Liabilities	$2,214,952	$2,098,122
Net Position	$7,643,086	$6,633,258

The Board's assets were $9,858,038 as of September 30, 2007, an increase of $1,126,658 from the end of FY 2006. Its total liabilities and net position (which together equal total assets) were $2,214,952 and $7,643,086, respectively, as of the end of FY 2007, increases of $116,830 and $1,009,828, respectively, from the end of FY 2006. The Fund Balance with Treasury (FBWT) represents the Board's largest asset. The increase in FBWT was due primarily to: a higher beginning balance from unobligated funds carried forward.

Analysis of the Statement of Net Cost

	FY 2007	FY 2006
Net Cost of Operations	$21,531,334	$20,618,579

The Board's net cost of operations for the year ended September 30, 2007 was $21,531,334, an increase of $912,755 or 4.4% over the FY 2006 costs. Costs increased primarily because of a higher FTE (i.e., fewer vacancies), Federal pay raises and other non-discretionary compensation and benefits increases.

Analysis of the Statement of Changes in Net Position

The Statement of Changes in Net Position reports the changes in net position during the reporting period. Net position is affected by changes in its two components - Cumulative Results of Operations and Unexpended Appropriations. The increase in Net Position of $1,009,828 from FY 2006 to FY 2007 is due primarily from the net change in Unexpended Appropriations. The increase of Unexpended Appropriations is because of the increase in Funds Balance with Treasury as explained above.

Analysis of the Statement of Budgetary Resources

The Statement of Budgetary Resources shows the sources of budgetary resources available and the status at the end of the period. It presents the relationship between budget authority and budget outlays, and reconciles obligations to total outlays. For FY 2007, the Board had Total Budgetary Resources available of $26,333,632, the majority of which was derived from new budget authority. This represents an increase of $2,444,819 or 10.2% over FY 2006 budgetary resources of $23,888,813. The increase was due primarily to a higher unobligated balance at the start of the year.

For FY 2007, the Statement of Budgetary Resources showed the Board incurred obligations of $22,382,741, an increase of $1,937,670 or 9.5% over FY 2006 obligations. The increase was primarily due to higher personnel costs resulting from both a higher FTE and Federal pay raises. Total Outlays for FY 2007 were $21,244,231, a $1,560,058 or 7.9% increase over FY 2006 outlays.

LIMITATION OF THE FINANCIAL STATEMENTS

The principle financial statements have been prepared to report the financial position and results of operations of the Board, pursuant to the requirements of the Accountability of Tax Dollars Act of 2002. While the statements have been prepared from the books and records of the Board in accordance with generally accepted accounting principles (GAAP) for Federal entities and the formats prescribed by OMB, the statements are in addition to the financial reports used to monitor and control budgetary resources which are prepared from the same books and records.

The statements should be read with the realization that they are used for a component of the U.S. Government, a sovereign entity.

The Board's financial statements were audited by Cotton & Company LLP.

SYSTEMS, CONTROLS, AND LEGAL COMPLIANCE

This section provides information on Board's compliance with the Federal Managers' Financial Integrity Act (FMFIA) and the Improper Payments Information Act, as well as other management information, initiatives, and issues. FMFIA requires that agencies establish controls that provide reasonable assurance that: (1) obligations and costs comply with applicable law; (2) assets are safeguarded from waste, loss, unauthorized use, or misappropriation; and (3) revenues and expenditures are properly recorded and accounted for. It also requires the Chairman to provide an assurance statement on the adequacy of management controls.

Assurance Statement (FMFIA)

The Defense Nuclear Facilities Safety Board's (Board) management is responsible for establishing and maintaining effective internal controls that meet the obligations of FMFIA within their areas of responsibility. Based on line managers' knowledge of daily operations and other management reviews, the Board is able to provide a qualified statement of assurance that the internal controls meet the objectives of FMFIA, with the exception of one material weakness. The details of the exception are described in our auditors internal control report included in Chapter 3.

A.J. Eggenberger, Chairman — Date

Improper Payments Information Act

The Board is considered to be at low risk for improper payments since the functional payment areas are limited to traveler reimbursement, commercial vendors for supplies and services, and the payroll EFT payments. The Board does not administer any entitlement, grant, or loan programs. During FY 2007, GSA and the Bureau of the Public Debt made net total payments of $21,244,231 on behalf of the Board. Neither the GSA accounting staff, nor the Board's finance staff, has identified any improper payments during this period.

Federal Travel Card Program

The Board is a full participant in the Federal Travel Card Program, and has issued travel credit cards to employees whose official duties may require them to travel. The Board's funds control staff routinely monitors each employee's usage of the travel card to ensure that charge activities are restricted to official government travel-related expenses, and that the employee is paying his/her credit card bills on-time.

During FY 2007, employees were reimbursed for authorized travel-related expenses no more than five working days after their completed travel vouchers were submitted for processing. During this same period, no Board employee's travel card account was more than 60 days delinquent and no inappropriate usage of the travel card was identified during our monthly review of credit card activity.

Federal Purchase Card Program

The Board has made extensive use of the U.S. Government's purchase card program to expedite the purchase of authorized supplies and services both in its headquarters and field operations. During FY 2007, transactions using individual purchase cards totaled $398,242.

The Board established a system of internal controls to ensure that only authorized purchases are made by each card holder. The Board's purchase card procedures were distributed to all new purchase cardholders during FY 2007. These procedures stressed the requirement for completion of the electronic training program necessary to exercise the delegations of procurement authority.

The Board's internal control procedures for the purchase card program feature a review much more stringent than the requirements of the program itself, without sacrificing the overall efficiency and timeliness of this purchasing method. All card purchases are reviewed and approved by the cardholder's supervisor, the purchase card coordinator, and finally, a Board contracting officer who gives final approval of invoices. The number of purchase cardholders is kept at the minimum necessary to effectively conduct Board operations. At the close of FY 2007, the total number of purchase cards issued was 9 at headquarters, and 6 at our field locations.

Federal Information Security Management Act (FISMA)

The Federal Information Security Management Act (FISMA) requires an annual, independent evaluation of each agency's information technology (IT) security program. In FY 2007, the Board has continued to submit all required FISMA reports to OMB.

The prior-year findings of our independent auditor highlighted the need for improvements in the policies and procedures of the Board's IT security program, specifically in the area of Certification & Accreditation (C&A). To address these issues, the Board is in the process of updating all of its policies and procedures related to C&A activities. This will allow the Board to have a better understanding of the risks faced in its IT systems and have greater assurances that adequate security controls have been implemented and are functioning as designed. **Accomplishments in FY 2007** include changes to the orientation process that ensure all new employees understand their security responsibilities, and further standardizing of the Board's annual IT security awareness training. Improvements in ensuring Board information is adequately protected were made by incorporating more specific IT security requirements into the agreements with the Board's external service providers.

Government Accountability Office (GAO) Investigations and Reports

Audit follow-up is an integral part of good management. In accordance with OMB Circular A-50, each agency must establish systems to assure the prompt and proper resolution and implementation of audit recommendations. During FY 2007, the GAO did not conduct any reviews or investigations of Board oversight programs, and there are no open audit recommendations from previous GAO reviews.

Chapter 2
Program Performance

Overall Outcome: Using its expert knowledge, the Board has complied with its statutory mission to ensure that public and worker health and safety are adequately protected at DOE defense nuclear facilities and met its performance goals for FY 2007. In a few cases noted in the report, additional safety improvements sought by the Board have not yet been fully achieved by DOE. The Board is actively pursuing these safety improvements in FY 2008.

INTRODUCTION

The Board's contribution to the safety of DOE's defense nuclear activities derives from four basic types of activities. First, the Board evaluates DOE's organization policies and processes to ensure that fundamental safety requirements necessary to undertake highly hazardous operations exist at DOE. These reviews evaluate topics such as technical competence of DOE and contractor personnel, adequacy of safety requirements and guidance, and the presence of a strong safety culture. The space shuttle Columbia tragedy and the subsequent report by the Columbia Accident Investigation Board clearly point out the safety significance of deficiencies in these areas and the need for safety organizations, such as the Board, to emphasize reviews of this type. The Board plans this type of oversight in advance and those plans are generally not affected by unanticipated changes in DOE's plans or activities.

The second major type of safety oversight activity performed by the Board is the evaluation of actual hazardous activities and facilities in the field. These reviews focus on identifying the hazards attendant with DOE's mission activities and evaluating the controls put in place to mitigate those hazards. The Board plans for these types of reviews based on the risk, complexity, maturity, and significance of the activities underway or planned by DOE. However, unanticipated changes in DOE's plans or new, emergent information often change the priority of the Board's oversight in this area. The Board continuously seeks to be proactive and to focus DOE's attention on the most significant safety issues present in the defense nuclear complex at any given time. Therefore, because the priority of safety issues can change rapidly, the Board cannot always predict in advance what activities it will review or what safety outcomes it will ultimately achieve.

Third, the Board provides expert-level reviews of the safety implications of DOE's actions, decisions, and analyses. It is extremely important that the Board provide DOE with independent evaluations of the technical quality and safety impacts of DOE's decisions and actions. For example, well-intended actions by DOE managers can have significant unintended negative consequences if they are based on faulty, inadequate, or misunderstood information.

The Board attempts to be proactive in conducting this type of reviews, but it is necessary that DOE first develop at least preliminary plans with sufficient detail to allow for a meaningful technical review. Therefore, it is not possible for the Board to plan its efforts in this important area explicitly in advance.

The Board does allocate resources to this form of oversight, and does report the significant outcomes that result from such oversight in its performance reports.

The last major type of oversight performed by the Board is the identification of new safety issues that were otherwise unknown in the DOE complex. Since, by definition, these safety issues would not have been addressed without the Board's efforts, this may be the area in which the Board has the largest impact on the safety of DOE's highly hazardous operations. However, by their very nature, it is impossible to plan for these emergent safety issues in advance. The effectiveness of this type of safety oversight activity relies exclusively on the expertise of the Board and its staff.

The Board uses its Strategic Plan and Annual Performance Plan to ensure that its resources remain focused on the most significant safety challenges and the DOE activities that warrant the most external review. All of the Board's safety activities are closely tied to goals and objectives embodied in these plans. This approach gives the Board confidence that its staff (fewer than 100 FTEs, including five full-time Board Members) and budget (approximately $21.9 million in FY 2007) are dedicated to the highest-risk activities under the Board's jurisdiction. The Board's strategic plan may be viewed in its entirety on the Board's internet website at *www.dnfsb.gov*.

The information in this *Performance and Accountability Report* is also provided directly to the Congress in the Board's statutorily required annual report, also available on the Board's website. There are slight differences between the two reports because the annual report covers calendar years rather than fiscal years. The Board's *Eighteenth Annual Report to Congress* will be issued during the first quarter of CY 2008. The Board's annual reports and performance reports are drafted by Federal employees of the Board with only administrative assistance from contractors.

SAFETY GOALS

The Board revised its strategic plan in 2003 to refocus its efforts and better align its resources to meet the challenges of ensuring safety in the defense nuclear complex as the DOE mission evolves during the latter half of this decade. Previous performance reports were established and executed to achieve the objectives of the earlier version of the Board's strategic plan. The changes to the plan are evolutionary in nature and primarily result in increased Board attention on ensuring safety in the area of nuclear facility design and infrastructure issues while maintaining vigilance in the areas of nuclear weapons and nuclear materials. The performance goals that result from the current strategic plan are summarized below.

SAFETY OVERSIGHT GOAL

The Board will assist DOE in improving safety at existing and proposed defense nuclear facilities by identifying health and safety issues affecting the public and the workers, recommending actions to address these issues, and ensuring that corrective actions are completed.

To achieve this general goal, the Board has identified the following four interdependent, strategic areas of concentration and has developed performance goals and outcome objectives for each:

AREA 1. NUCLEAR WEAPON OPERATIONS:

Performance Goal: DOE operations that directly support the nuclear stockpile and defense nuclear research are conducted in a manner that ensures adequate protection of the health and safety of the workers and the public.

AREA 2. NUCLEAR MATERIAL PROCESSING AND STABILIZATION:

Performance Goal: The processing, stabilization, and disposition of DOE defense nuclear materials and facilities are performed in a manner that ensures adequate protection of the health and safety of the workers and the public.

AREA 3. NUCLEAR FACILITIES DESIGN AND INFRASTRUCTURE:

Performance Goal: New DOE defense nuclear facilities, and major modifications to existing facilities, are designed and constructed in a manner that ensures adequate protection of the health and safety of the workers and the public.

AREA 4. NUCLEAR SAFETY PROGRAMS AND ANALYSIS:

Performance Goal: DOE regulations, requirements, and guidance are developed, implemented, and maintained; and safety programs at defense nuclear facilities are established and implemented; as necessary to protect the health and safety of the workers and the public.

ANNUAL PERFORMANCE OBJECTIVES

The Board's *Annual Performance Plan for FY 2007* identified annual performance objectives that consist of reviews that were to be conducted in support of the Board's strategic plan, plus the identification of candidate areas for these reviews. An outcome measure for each objective is described as part of the discussion of each annual performance goal. Qualitative assessments of the outcome associated with each annual performance goal are provided in this chapter of the Board's PAR.

The Board measures progress toward achieving the positive outcomes embedded in each annual performance goal in three stages, by evaluating:

- The DOE's acknowledgment that a safety enhancement is needed after the Board communicates the results of its technical reviews;
- The DOE's subsequent development of appropriate corrective actions to resolve the Board-identified safety issue; and
- The DOE's implementation of the necessary corrective actions, leading to the successful resolution of the safety issue and resulting in improved protection of the public, the workers, and the environment.

The basis of measurement for the qualitative assessment includes formal, publicly-available, correspondence from DOE and its defense nuclear contractors, Board correspondence, staff reports, DOE and contractor public testimony, and other sources. Past reporting (see the Board's annual reports) of Board-identified issues and associated DOE responses demonstrates that the Board has had a clear and positive impact on the safety of DOE defense nuclear activities.

Evaluation of the *Fiscal Year 2008 Performance Plan*

No changes to the *FY 2008 Performance Plan* have been identified based on a review of actual results achieved in FY 2007.

Assessment of the Reliability and Completeness of Performance Data

The sources used by the Board to measure its outcome are robust, varied, and independent. Documentation of accomplishments includes the Board's Annual Reports to the Congress, correspondence to and from the Department of Energy, Board technical reports, and public meeting records. These documents are available for public review on the Board's Internet web site, *www.dnfsb.gov*. As such, the Board believes that the performance data used in this report are reliable and complete.

The Board did not conduct an independent program evaluation in FY 2007.

Comparison of Fiscal Year 2007 Actual Performance with Planned Performance

The following pages provide detailed information comparing the Board's actual performance driving safety improvements at DOE to its plans for FY 2007.

PERFORMANCE GOAL 1: NUCLEAR WEAPON OPERATIONS

DOE operations that directly support the nuclear stockpile and defense nuclear research are conducted in a manner that ensures adequate protection of health and safety of the workers and the public.

OUTCOME: DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the Board. Follow-up technical evaluation of DOE's nuclear stockpile activities will verify necessary improvements in safety.

FY 2007 Performance Objectives:

The Board and its staff will verify the safety of DOE's defense nuclear facilities and activities relating to the maintenance, storage, and dismantlement of the nuclear weapon stockpile, quality assurance of the stockpile, as well as its associated research and development, and the capability to test nuclear weapons and disposition damaged or improvised nuclear devices (such as a terrorist device).

The Board and its staff will conduct assessments of DOE's efforts to develop and implement safety management systems for stockpile management activities. The Board's evaluations will be split between DOE efforts to develop safety systems (e.g., system and process designs, safety bases, control schemes, and administrative programs) and DOE efforts to implement safety management systems. These reviews will focus on activities at the Pantex Plant, Y-12 National Security Complex (Y-12), Savannah River Site (SRS) tritium facilities, Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), Sandia National Laboratories (SNL), and the Nevada Test Site (NTS).

Representative areas for the Board staff review include:

- Development, implementation, and refinement of site-wide and facility-specific safety analyses and controls for nuclear facilities and activities (e.g., safety analysis reports and annual updates per 10 CFR 830).
- Weapon-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., W76, B53, B83, W80, W88).
- Nuclear explosive operations at Pantex (e.g., conduct of operations, process documentation, and tooling).
- Laboratory support of nuclear explosive operations at Pantex (e.g., sensitivity testing of high explosives, electrostatic discharge studies, weapon response evaluation and documentation).
- Cross-cutting functional areas at Pantex, Y-12, LANL, LLNL, or SRS tritium facilities (e.g., legacy material disposition, nuclear criticality safety, fire protection, nuclear explosive safety, seismic design, conduct of operations, work planning, configuration management).
- Special studies of unique or significant hazards at DOE nuclear facilities (e.g., classified projects, process technology alternatives, and disposition of special items and by-product materials).
- Relocation of Quality Evaluation activities at Y-12.

- Plans for the management of special nuclear material at Y-12 during the transition period before the new enriched uranium facilities are designed and constructed.
- Modernization plans for Y-12, including the Beryllium Capability Project, accelerated dismantlement, and infrastructure upgrades.
- Implementation of the Documented Safety Analysis for the Building 9212 Complex at Y-12.
- Corrective actions related to Uranium Holdup Survey Program at Y-12, and development of the next generation program.
- Startup testing with tritium gas in the Tritium Extraction Facility at SRS.
- Plutonium pit manufacturing and certification at LANL.
- Corrective actions to strengthen institutional safety programs and infrastructure at LANL and LLNL.
- Preparations to dispose of damaged nuclear weapons or improvised nuclear devices at NTS.
- Readiness to resume underground nuclear weapons testing at NTS, if testing were to resume.
- Readiness of the Device Assembly Facility for nuclear facility operations.
- Preparations for criticality reactor (Criticality Experiments Facility) operations at the Device Assembly Facility at NTS.
- Age-related changes in nuclear weapons components for weapon systems in the enduring stockpile.
- Implementation of Recommendation 2005-1, *Nuclear Material Packaging*.

While performing its reviews, the staff will assess the effectiveness of ISM implementation and the safety controls identified for ongoing operations as well as any new weapon system dismantlement projects as Pantex, Y-12, or NTS that start in FY 2007.

FY 2007 Measured Performance:

Nuclear Explosive Safety. In response to a commitment made to the Board in 2005, DOE conducted a comprehensive "Top-Down Review" of its nuclear explosive safety directives. On November 2, 2006, DOE issued a corrective action plan to implement selected recommendations from the Top-Down Review. Since that time, many of these commitments have been completed; execution will continue in FY 2008.

Quality of Safety-Related Information for Pantex. The Implementation Plan for Recommendation 98-2, *Safety Management at the Pantex Plant*, addresses the need for DOE to issue further guidance on its expectations for the evaluation and documentation of weapon response to potential accident environments and stimuli. The Board issued letters on December 15, 2006, and May 10, 2007, requesting DOE's expectations for the review, approval, and implementation of the expert elicitation, expert judgment, and peer review processes that are key to improving the quality and consistency of safety-related information provided to Pantex by the design agencies. In response to the Board's letters, DOE held a workshop on July 16, 2007, to clarify its expectation that the design agencies develop these processes by the end of FY 2007. DOE is in the process of developing criteria for review and approval of these processes.

Conduct of Operations at Pantex. The Board issued a letter in May 2005 identifying deficiencies in the conduct of nuclear explosive operations at Pantex. In a March 2006 letter, the Board re-emphasized the importance of a consistently high degree of formality in the conduct of nuclear explosive operations. After a follow-up review in FY 2007, the Board noted slow but continued improvement. However, the Board observed that staffing levels for the personnel responsible for the oversight of nuclear explosive operations had dropped dramatically. The Board also observed a lack of consistency in the formality of operations. Since the review, the operating contractor has increased its oversight personnel and is continuing to seek personnel to increase its oversight staffing to an acceptable level.

Lightning Protection at Pantex. The Board issued a letter on March 30, 2007, identifying that work remains to adequately address the hazards posed by the indirect effects of a lightning strike on Pantex facilities. DOE has responded by forming the Nuclear Weapons Complex Lightning Committee to analyze these hazards.

Pantex Procedures. In a letter dated April 23, 2007, the Board provided recent examples of inadequacies in technical procedures and noted that improvements are needed in the processes for development, review, validation, and configuration management for procedures at Pantex. The Board requested that DOE identify the specific measures it plans to take to improve the quality of technical procedures at Pantex. In response, DOE is taking specific measures to improve the flowdown of safety-related requirements into procedures, the procedure validation process, and the level of detail in technical procedures.

Pantex Safety Basis. In a letter dated July 30, 2007, the Board identified several issues with the Pantex safety basis. Issues included the treatment of beyond design basis accidents, the level of detail in some technical safety requirements, and a systematic lack of timeliness in declaring potential inadequacies in the safety basis. The Board also noted in its letter that DOE has lost configuration control of its safety basis. DOE recognizes the loss of configuration control of its safety basis and has developed a project plan to remedy the problem. DOE is also addressing the other issues identified by the Board.

W76-1 Start-up Activities at Pantex. In a letter dated July 16, 2007, the Board expressed concern regarding DOE's willingness to deviate from DOE requirements and typical good practices in response to growing production demands. Specifically, the readiness activities for W76-1 operations could not be performed with the expected level of rigor in the time frame specified by DOE. The Board identified in its letter that both the Nuclear Explosive Safety Study and the contractor readiness assessment for W76-1 assembly operations were conducted without an approved safety basis in place. DOE has responded to the concerns raised in the Board's letter by ensuring that the contractor Readiness Assessment and the Nuclear Explosive Safety Study for upcoming W80 operations are conducted with an approved safety basis in place. Also in response to the Board's letter, the NNSA Central Technical Authority issued guidance to all NNSA sites clarifying that facility safety documentation that addresses an activity being started or restarted must be approved and implemented prior to beginning the contractor readiness assessment or readiness review for that activity.

Electrostatic Discharge at Pantex. The Board evaluated efforts by DOE and the weapons design agencies to characterize potential electrostatic discharge effects during nuclear explosive operations and the response of sensitive components to them. To date, a generally conservative response to this threat

has been maintained; however, the Board continues to evaluate whether additional measures may enhance both the understanding of the hazards and the best methods for controlling them.

Pantex Cell Gap Analysis. The Board evaluated calculations of leakage through gaps in cells used for nuclear explosive operations during postulated accident scenarios at the Pantex Plant. The Board determined that such leakage does not appear to be an issue for accident scenarios involving single-unit operations, but could present a concern for multi-unit operations involving certain systems in certain facilities. DOE will perform additional analyses to provide assurance that the evaluation guidelines will not be challenged for multi-unit operations.

Degradation of 9212 Complex at Y-12. The Board had previously evaluated DOE's ability to safely operate the 60-year-old 9212 Complex at Y-12. As a result, DOE submitted an analysis identifying facility improvements necessary to ensure safe operation until completion of the planned replacement facility, the Uranium Processing Facility. As major structural and process modifications to the 9212 Complex would be impractical, the Board advocated a regimen of increased vigilance and regular assessment of the physical condition of the 9212 Complex. In response, DOE is working to develop a detailed plan to annually assess the 9212 Complex.

Conduct of Operations at Y-12. The Board has noted improvement in conduct and formality of nuclear operations at Y-12 during recent years. However, following several operational errors and events, the Board urged DOE to consider action to achieve consistent, disciplined operations. DOE developed and began to implement a plan to address these issues.

Fire Protection at Y-12. In response to Board correspondence in 2002, DOE developed a ten-year comprehensive improvement plan for fire protection at Y-12. Significant improvements were made, but progress stalled during 2006 due to a reduction in funding. The Board queried DOE on its plans for completing the project. DOE has revised its plan and intends to complete the project in its nuclear facilities.

Conduct of Engineering at Y-12. In 2005, DOE discovered that a new vessel was not designed to preclude a nuclear criticality accident in a water intrusion scenario. DOE implemented a design change and planned an investigation. Later, the Board found that the investigation was not completed. DOE performed the investigation and developed corrective actions. The Board found that the corrective actions did not address the lack of an appropriate design review of the new installation. As a result, DOE is revising Y-12 engineering procedures to require appropriate design reviews of such new nuclear process installations or modifications.

Handling of Legacy Items at Y-12. The Board reviewed actions taken by Y-12 in response to a small fire during an operation to open and inspect a container with uranium metal items that had not been opened in more than 30 years. The Board found that Y-12 did not provide adequate restrictions and control on opening such legacy containers in air environments. In response, DOE developed additional operational controls to ensure adequate hazard analysis and review prior to opening legacy containers in an air environment.

Readiness to Dispose of a Damaged Nuclear Weapon. As a result of the Board's interactions and follow-up discussions in FY 2007, DOE stated that a revised safety analysis is being developed that will identify safety controls and upgrades appropriate for the scope of operations for the facility at NTS (G tunnel) that would be used in disposition of a damaged nuclear weapon or threat device. The Board expects the new analysis to be available for review in 2008.

Device Assembly Facility at NTS. The Board previously identified the need for a comprehensive assessment of safety systems and safety management programs at the Device Assembly Facility (DAF) in light of the new missions being undertaken there. In FY 2007, the Board evaluated the implementation of the safety basis and the conduct of readiness reviews for new operations in the facility. The Board determined that DOE had successfully implemented the assessments suggested by the Board and developed corrective actions for safety management programs and vital safety systems in DAF.

Concrete Cracking in DAF. The Board has identified that the extensive cracking in DAF may indicate poor construction practices that adversely affect the concrete's strength. In response, DOE developed plans in FY 2007 to assess the in-situ strength of the concrete.

LANL Chemistry and Metallurgy Research Facility Life Extension. The Chemistry and Metallurgy Research (CMR) facility suffers from age and known seismic vulnerabilities, which led DOE (a decade ago) to define 2010 as the facility's end of life. In fall 2006, the Board observed that DOE had diametrically opposed plans for CMR, which could pose safety concerns—plans were being made for reductions in engineering resources due to its approaching end of life, while at the same time, other plans relied on the facility to support increased programmatic missions, particularly pit manufacturing, until a replacement facility became available in approximately 2016. As a result of providing these observations to the DOE senior management, a formal life extension project has been initiated to determine the necessary steps to safely continue certain operations beyond 2010.

Pit Manufacturing at LANL. The Board evaluated the integration of safety-in-design with regard to various individual activities involving the installation of manufacturing equipment at the LANL Plutonium Facility. Ultimately, DOE intends to produce increased numbers of pits at LANL, and establish the capability to manufacture legacy pit types or, if authorized, a Reliable Replacement Warhead. The Board identified that DOE's project management efforts were narrowly focused on pit manufacturing equipment, and did not encompass the associated infrastructure and other support facilities required to safely execute an expanded pit manufacturing mission. In response, DOE is reinvigorating an Integrated Nuclear Planning effort to ensure safety is properly integrated into planning for the pit manufacturing project.

Nuclear Criticality Safety at LANL. The Board has followed closely the Criticality Safety Program Improvement Plan developed by LANL in response to the findings of an October 2005 DOE review that revealed non-compliances with applicable ANSI/ANS standards and DOE Orders. In a letter dated September 22, 2006, the Board observed that the Program Improvement Plan was not receiving appropriate attention and priority from DOE management. The Board questioned DOE on the need for compensatory measures until the program was brought into compliance and on how the management approach would be bolstered to ensure timely completion. In response, DOE initiated an independent team to review progress on the Program Improvement Plan, developed a performance incentive to

encourage LANL accomplishment in this area, and assigned a full-time criticality safety engineer at the Los Alamos Site Office. A follow-up review by the Board led to the identification of further deficiencies in specific criticality analyses, prompting a stand-down of fissile material operations at the LANL Plutonium Facility. DOE then began an extensive review of assumptions and limitations within the associated criticality safety analyses. Additionally, the Board identified the need to reinvigorate actions to replace the outdated information system used to track storage and transfer of fissile materials.

Transuranic Waste Operations at LANL. The Board urged DOE in a letter dated January 18, 2007, to expeditiously develop a viable disposition pathway for the large inventory of legacy transuranic waste at LANL, particularly for the containers with the highest radiological inventory. In response, DOE has reinvigorated waste disposition work at LANL, including accomplishing facility infrastructure upgrades, developing needed new safety bases, and training and qualifying operators to the associated new procedures.

Safety Improvements at LANL. The Board visited LANL in November 2006, and in a letter dated February 1, 2007, observed five key areas requiring underlying actions that would substantially improve the laboratory's safety posture. These key areas are strengthening federal safety oversight, improving safety bases and ensuring the efficacy of safety systems, eliminating known hazards, and increasing federal management of new projects. DOE subsequently made progress in some of these areas. For example, DOE detailed senior managers to the Los Alamos Site Office to fill critical oversight positions during the search for permanent staff, and completed actions to disposition some of the site's remaining inventory of legacy plutonium-238 residues.

Confinement Ventilation at the LANL Plutonium Facility. The safety basis for the LANL Plutonium Facility credits a passive confinement strategy instead of active confinement ventilation as a safety-class control to protect the public from postulated accidents. Under the Implementation Plan for the Board's Recommendation 2004-2, *Active Confinement Systems*, an evaluation of the facility's confinement strategy was completed this year in parallel with a separate effort to develop a new documented safety analysis for the facility. The Board assessed both efforts and observed that the draft documented safety analysis continued to rely on a safety-class passive confinement approach and did not incorporate the results of the facility analysis. As a result, DOE has developed a path forward that should improve the safety analysis and implementation of controls for the facility.

Nuclear Criticality Safety Program at LLNL. In an October 2006 letter to DOE, the Board noted the weak implementation of criticality safety requirements and the need for additional rigor in conduct of operations and in the verification of compliance of criticality limits at LLNL. The Board also noted a lack of quality assurance procedures for safety-related software systems that are relied upon to verify criticality and other safety limits. In response, LLNL management directed the implementation of improvements to the Nuclear Criticality Safety Program.

Radiography Facility at LLNL. The Board has been closely following operations involving special nuclear materials in the LLNL Radiography Facility and has noted weaknesses in the areas of material packaging, development of work permits, posting of radiological controls, and training. In response, LLNL management increased attention to these operations, which has resulted in observed improvements in work permit development, radiological postings, and discipline of operations.

Resumption of Programmatic Operations at LLNL. Following a standdown to address fundamental safety issues, limited operations in the LLNL Plutonium Facility were authorized to resume in FY 2006 using a formal process for achieving and verifying readiness. In April 2006, the Board observed LLNL's readiness assessment to remove the remaining compensatory measures and return to normal operations, and determined that operations could safely resume. The standup of the Plutonium Facility was completed in early FY 2007.

LLNL Legacy Item Disposition Project. The Board has been closely following efforts to address the unique hazards of a legacy item (referred to as Object 77) at LLNL and the unusual challenges to the facility and personnel associated with its safe disposition. The Board identified deficient safety controls, leading LLNL to develop specific administrative controls to safely disposition the item. In FY 2007, preparations to disposition the item included integrated dry runs as part of LLNL and DOE readiness assessments. In May 2007, the key phases of the project to disposition the item were safely completed, thus eliminating the unique hazards associated with it.

Critique Process at LLNL. In FY 2007, the Board evaluated the informal methods used at LLNL to gather information on safety-related events and identify follow up actions. The Board strongly urged the development of a more rigorous and formal process for critiquing such events. A critique procedure was developed in early FY 2007. In March 2007, a new Nuclear Material Technology Program Event Critiques procedure was employed, with observed weaknesses. Board evaluation of subsequent critiques has indicated that the formal process is improving and will significantly enhance safety at LLNL by providing a clearer understanding of events and the necessary follow up actions.

Configuration Management at LLNL. In a November 2004 letter, the Board identified the apparent lack of configuration management of vital safety systems at LLNL facilities. Subsequently, LLNL established procedures and processes to maintain an interim configuration management system and developed a resource-loaded schedule integrated with the documented safety analysis implementation schedule. A recent subsequent review by the Board identified a lack of quality in the interim system drawings. DOE has drafted a corrective action plan to address this plus numerous additional issues, including configuration management programs and supporting processes.

Safety Basis at Sandia National Laboratories, New Mexico. In late FY 2005, the Board identified fundamental weaknesses in the implementation of nuclear safety requirements and controls at a defense nuclear facility located at SNL. In 2007, SNL completed implementation of a Safety Basis Improvement Project to resolve the underlying safety-related deficiencies and implemented a Safety Basis Operations Schedule. The Board has noted continued progress during its reviews.

Integrated Safety Management at Sandia National Laboratories, New Mexico. In FY 2005, the Board identified multiple failures of the hazard analysis and work control process at SNL. In response, DOE developed a corrective action plan to ensure the associated weaknesses are corrected and that integrated safety management is fully implemented. Near-term corrective actions for defense nuclear facilities are now complete. Sandia corporate-level systems must be implemented to achieve site-wide ISM standards.

Tritium Extraction Facility. The Board identified concerns with the reliability of safety-related equipment for sustained operations at the Tritium Extraction Facility at the Savannah River Site. During readiness reviews for this new facility, the Board observed multiple failures relating to the operability of the tritium air monitors, target rod preparation module, ventilation system, electronic procedures, and fire alarm system. Due to the Board's concerns as well as the readiness review findings, the site operating contractor commissioned an independent assessment to address the equipment reliability issues.

Tritium Extraction Facility Conduct of Operations. The Board evaluated conduct of operations issues at the Savannah River Site's tritium facilities, and highlighted several issues relating to a wide range of tritium operations. The number and severity of the issues indicated a potential adverse trend in facility operations. In response, DOE included tritium operations in a recent independent assessment that will address causes and corrective actions for the observed issues.

Nuclear Material Packaging. In FY 2006, the Board identified errors in analysis and reasoning used in two principal deliverables of DOE's implementation plan for Recommendation 2005-1, *Nuclear Material Packaging*. The Board worked with DOE to improve the repackaging prioritization methodology and the requirements contained in draft DOE Manual 441.1-1, *Nuclear Material Packaging Manual*. As a result, on March 9, 2007, DOE released the draft Manual for comment into the Review and Comment System and forwarded it, along with the repackaging prioritization methodology, to the sites for development of plans to achieve compliance.

PERFORMANCE GOAL 2: NUCLEAR MATERIAL PROCESSING AND STABILIZATION

The processing, stabilization, and disposition of DOE defense nuclear materials are performed in a manner that ensures adequate protection of health and safety of the workers and the public.

OUTCOME: DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the Board. Follow-up technical evaluation of DOE's nuclear materials management and facility disposition activities will verify necessary improvements in safety, as DOE meets its commitments to the Board to stabilize and dispose of hazardous nuclear materials.

FY 2007 Performance Objectives:

The Board and its staff will conduct assessments of DOE's efforts to characterize, stabilize, process, and safely store plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, to ensure that these efforts are performed safely and that the risks posed by these materials are addressed in a timely manner. These reviews will be conducted using the principles of Integrated Safety Management and will include assessments of the adequacy of current storage conditions, evaluations of proposed treatment and disposal technologies, evaluations of the design of new facilities and process lines, assessments of facility readiness to safely begin new operations (including implementation of 10 CFR 830, *Nuclear Safety Management*), the safety of ongoing operations, and the suitability of long-term storage and disposal facilities. Representative areas for review include:

- Stabilization, packaging, and storage of neptunium oxide at the Savannah River Site (SRS) (Recommendations 94-1/2000-1).
- Safe long-term storage of neptunium oxides at the Idaho National Laboratory (INL) resulting from stabilization operations at the SRS (Recommendations 94-1/2000-1).
- Integrated, complex-wide planning for consolidation and disposition of special nuclear materials.
- Safety of design of modifications to Building 3019 at the Oak Ridge National Laboratory in preparation for processing of the uranium-233 inventory.
- Stabilization and disposal of plutonium-bearing residues at Los Alamos National Laboratory (LANL) (Recommendations 94-1/2000-1).
- Consolidation of complex wide activities involving plutonium-238 used for national security purposes.
- Safety of spent nuclear fuel sludge retrieval, treatment, and storage at the Hanford Site (Recommendations 94-1/2000-1).

- Safety of efforts to consolidate, store, and disposition spent nuclear fuel at Hanford, INL, and SRS.
- Safety of cesium and strontium capsule storage at the Hanford Site.
- Design of treatment facilities for high-level waste (HLW) liquids and salts at the SRS, and system improvements to ensure safe management of the SRS HLW (Recommendation 2001-1).
- Maintaining HLW storage tank structural and leak integrity at SRS and the Hanford Site and application of the results of DOE's corrosion testing program to corrosion chemistry controls.
- Safe operation of HLW retrieval and transfer systems at the Hanford tank farms.
- Conduct of operations and work planning at the Hanford tank farms.
- Final cleanout and closure of the HLW tanks at INL.
- SRS deactivation and decommissioning activities.
- INL decommissioning activities.
- Hanford Site decommissioning activities (e.g., monitoring of decommissioning work at the Plutonium Finishing Plant, K-Basins and River Corridor Closure Project).
- Safe execution of the Tank W-1A retrieval project at the Oak Ridge National Laboratory (ORNL), including excavation and removal of remote-handled transuranic waste.
- Final closure activities at the Miamisburg (Mound) Closure Project.
- Continued safe operation of the Melton Valley TRU/alpha waste treatment facility at ORNL.
- Safety of ongoing contact-handled transuranic (TRU) waste operations and safe startup of anticipated remote-handled TRU waste operations at the Waste Isolation Pilot Plant (WIPP).
- Safety of the retrieval, characterization, and packaging of TRU waste drums at the Hanford Site, INL, LANL, and SRS.
- Improvement in cooperation and communication between the WIPP contractor and TRU waste storage/generator sites.

FY 2007 Measured Performance:

Waste Leak at Hanford Tank Farms. In August 2007, operators backflushing a high-level waste transfer pump in the Hanford tank farms caused a leak of high-level waste to the environment. The Board responded quickly by assigning one of the Board's Site Representatives to continuously follow all emergency response actions and recovery actions. The Board noted the potential for a common-cause

failure in other areas of the Hanford site, and DOE took appropriate corrective action to prevent a similar event, as well as validate that other sites in the complex were not susceptible to a similar incident. DOE has chartered a formal Type A investigation team to review the incident.

Neptunium-237 at Savannah River Site. As part of its commitment under the Board's Recommendations 94-1 and 2000-1, DOE completed stabilization, packaging, and storage of pre-existing neptunium-237 solutions at SRS.

Nuclear Material Stabilization and Storage at LANL. In response to the Board's Recommendation 2000-1, contractors at LANL reached and exceeded several milestones of their Implementation Plan (IP) for the stabilization and storage of nuclear materials. LANL's contractor stabilized more than 50 percent of the site's weapons grade and non-weapons grade plutonium. Additionally, the contractor stabilized more than of 50 percent of 248 kg of materials designated for the Recovery Evaluation Process.

Uranium-233 Downblending at ORNL. The Board communicated weakness in the development of the Preliminary Documented Safety Analysis for the Uranium-233 Downblending Project. DOE has been receptive to these comments and plans to integrate them into future revisions of the Preliminary Documented Safety Analysis.

Hanford Sludge Retrieval and Disposition Project. At Hanford, DOE completed the retrieval and transfer of K-East basin sludge to K-West Basin holding tanks and the retrieval of K-West Basin sludges into the same holding tanks. The Board reviewed the Sludge Treatment Project at Hanford and noted that portions of the Preliminary Documented Safety Analysis were based on the conceptual and preliminary design instead of the final design. The Board also identified that the final design information for safety systems was not sufficiently mature to meet the required criteria. DOE halted design efforts, re-established the project at the conceptual design stage, and implemented formal project management processes.

Use of Divers at the Hanford K-Basins. At the Hanford K-Basins, DOE's contractor planned to use divers to assist in basin cleanout. The Board thoroughly reviewed these plans and discussed with DOE several concerns regarding work planning, work procedures, and safety controls. In response, DOE conducted additional mockups of the diving effort and determined that the divers would not be ready in time to assist in near-term work at the K-East Basin. The plan was shelved, but may be used in the future during the cleanup of the K-West Basin.

Tank 48 Disposition at SRS. In response to the Board's Recommendation 2001-1, DOE began planning and design for removal of organic wastes from Tank 48 at SRS. This will allow Tank 48 to be returned to high-level waste service, adding 1.3 million gallons of space. DOE conducted three independent reviews of several organic destruction methods and determined that fluidized-bed steam reforming is a leading treatment candidate. DOE plans to select a preferred alternative in the Fall of 2007 and return Tank 48 to service by 2013.

Integrated High-Level Waste Salt Processing at SRS. Also in response to Board Recommendation 2001-1, DOE completed construction and began startup testing of the Actinide Removal Process and the Modular Caustic Side Solvent Extraction Unit. DOE planned to integrate the two projects and initiate

radiological operations in early fiscal year 2008. Startup of this project is an important milestone for the High-Level Waste System as it will remove salt waste from the tanks and serve as a pilot plant for the Salt Waste Processing Facility.

Hanford Tank Farms Fill Height Increase. DOE increased the fill height of Tank AP-108 in April 2007. Prior to the increase, the Board reviewed operator readiness, the safety basis, and tank integrity analysis, and expressed concerns about the structural and seismic methodologies used in the analyses. In response, DOE re-engaged outside experts to review the structural calculations, and discovered potential new safety concerns to be resolved prior to increasing the fill height of the next tank.

High Level Waste Tank Corrosion Control. The Board encouraged DOE to continue laboratory testing of corrosion mechanisms related to High Level Waste tanks. This effort will lead to assurances that DOE's High Level Waste tanks can continue to perform as designed for an anticipated 30 more years. DOE continues this testing at CC Technologies in Ohio. Based on the test results for Tank AN-107 at Hanford, DOE imposed a change in sludge chemistry limits for this tank. Tests for corrosion propensity of nitrate and nitrite chemistry in Tank AP-101 and carbonate-based chemistry in Tank AY-102 showed less aggressive corrosion than that in Tank AN-107. Hence, DOE plans to implement less-restrictive chemistry limits for Tanks AP-101 and AY-102.

Waste Storage in Tank 11 at SRS. In the Implementation Plan for Recommendation 2001-1, *High-Level Waste Management at the Savannah River Site*, DOE stated that no waste would be stored in old, non-compliant waste tanks. However, further delays in salt waste processing at SRS have exacerbated the tank space situation there. In response, DOE again proposed the use of an old tank, Tank 11, for waste storage. The Board reviewed this proposal and agreed that waste can be safely stored in Tank 11, given that DOE follows eleven specific safety precautions.

Decommissioning Activities at Hanford's Plutonium Finishing Plant. Due to delays in its ability to consolidate nuclear materials, decommissioning of the Plutonium Finishing Plant has been extended from 2009 to 2016. The Board reviewed the results of contractor life extension evaluations to determine if upgrades or replacements of vital safety systems are required during this extended decommissioning period. The Board agreed with planned upgrades to certain safety systems, but is continuing to evaluate the adequacy of aged cables and electrical equipment necessary to operate the vital safety systems.

Air Filters at Hanford's Plutonium Finishing Plant. In response to a positive Unreviewed Safety Question report on the adequacy of High Efficiency Particulate Air (HEPA) filter, the Board requested information regarding the test method used in conjunction with the HEPA filters. The Board found that the test method did not satisfy the requirements in the American Society of Mechanical Engineer's standards, but that the contractor's compensatory measures and planned facility modifications to meet the standard were adequate.

Retrieval of Buried Radioactive Waste at Hanford. DOE continues to remove radioactive and hazardous wastes from several old burial grounds at Hanford. Dispersal of radioactive materials is possible during remediation of these burial grounds. The Board questioned the adequacy of work planning and the level of controls called for in the safety analyses. In response, DOE is working to develop improved controls to protect the workers and the public.

Idaho Facility Startup Process. DOE's contractor at the Idaho Cleanup Project authorized the startup of remote-handled TRU waste drum venting after completing a contractor management self-assessment (MSA). The Board commented to DOE that an MSA reflects a level of rigor far less than that required for the startup of a Hazard Category 2 nuclear activity. In response, DOE performed an independent review of the Idaho startup processes and found that the site was not in compliance with their own procedures. DOE managers at Idaho committed to making changes to improve the startup readiness process.

TRU Waste Drum Retrieval and Characterization. The Board noted inconsistent, and in some cases unsafe, activities during the retrieval, characterization, and handling of TRU waste drums at several sites. In response, DOE's TRU Waste Corporate Board formed a working group to develop a consistent approach for handling TRU waste drums, and for controlling the hazards associated with the drums. This effort culminated in the issuance of DOE-STD-5506-2007, *Preparation of Safety Basis Documents for Transuranic (TRU) Waste Facilities*. The Board continued to follow the subsequent effort by TRU waste generator sites to come into conformance with the standard.

TRU Waste Shipment at SRS. DOE planned a "non-routine" shipment of TRU waste between facilities on-site at SRS. These planned shipments included large quantities of radioactive materials and presented a significant risk to workers. The Board reviewed the plans for this effort and found an inadequate safety analysis for the shipments and a lack of DOE oversight. After discussion between the Board and DOE, the DOE site manager directed the contractor to submit appropriate safety documents to DOE for approval prior to commencing shipment.

PERFORMANCE GOAL 3: NUCLEAR FACILITIES DESIGN AND INFRASTRUCTURE

New DOE defense nuclear facilities, and major modifications to existing facilities, are designed and constructed in a manner that ensures adequate protection of the health and safety of the workers and the public.

OUTCOME: DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the Board. Follow-up technical evaluation will verify necessary improvements in the design and construction of DOE's new nuclear facilities and major modifications to existing facilities. New nuclear facility designs will meet acceptable safety standards.

FY 2007 Performance Objectives:

The Board and its staff will continue its reviews of DOE's implementation of integrated safety management in design and construction activities. At least five reviews will be completed. In general, the reviews will evaluate the adequacy of geotechnical specifications and hazards analyses; the design of safety-related structures, systems and components (SSC); and the adequacy of SSC installation, startup and operational readiness. Candidates for review include:

- Continue design and construction reviews of the Waste Treatment Plant at the Hanford Site. Resolve outstanding issues with seismic and structural design, and fire protection.
- Review final design of the Demonstration Bulk Vitrification facility at the Hanford Site.
- Review the final design and review start of construction of the Integrated Waste Treatment Unit at the Idaho National Laboratory.
- Review the preliminary design of the Chemistry and Metallurgical Research Replacement Facility at the Los Alamos National Laboratory.
- Review design and construction of the Criticality Experiments Facility at the Device Assembly Facility at the Nevada Test Site.
- Review final modifications and preparations for operations for the Special Nuclear Material component Requalification Facility at the Pantex Plant.
- Review of the design of the Component Evaluation Facility at the Pantex Plant.
- Review the design of the Salt Waste Processing Facility for treatment facility for high-level waste liquids and salts at SRS.

- Review modifications to existing SRS facilities to increase long-term plutonium storage capacity and provide long-term stabilization/packaging capability through the Container Surveillance and Storage Capability (CSSC) project and K-Area Interim Surveillance project. (Public Law 107-314, Section 3183)

- Review the final design of the Pit Disassembly and Conversion Facility at SRS.

- Continue construction reviews of the Highly Enriched Uranium Materials Facility at the Y-12 National Security Complex.

- Review the preliminary design for the Uranium Processing Facility at the Y-12 National Security Complex.

- Review the development of geotechnical probabilistic seismic hazard curves for the SRS, and Idaho sites.

As a result of these reviews, DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the Board. Follow-up technical evaluation will verify necessary safety improvement in the design and construction of DOE's new nuclear facilities and major modification to existing facilities. New nuclear facility designs will meet acceptable safety standards.

FY 2007 Measured Performance:

The Board and its staff continued providing technical evaluations of numerous design and construction projects through out the DOE complex. These evaluations have led to DOE improving its design process, enhancing the design of new facilities, correcting construction deficiencies noted, as well as starting actions to correct identified issues. Some of these actions are:

Safety-in-Design Public Meetings. The Board held its third public meeting delving into the DOE design process for new defense nuclear facilities. This public meeting, held on March 22, 2007, was a continuation of previous public meetings concerning the Board's interest in integrating safety earlier into the design process. During the Board's first two public meetings, the Board focused on the adequacy of DOE's existing directives related to the design of new facilities and further explored integration of safety in design and the progress being made in implementing DOE's safety-in-design initiatives. The Board's third public meeting considered early issue identification, communication of the Board's issues to DOE, issue management, and timely closure or resolution of the issues. DOE outlined many of the improvements that have occurred as a result of its safety-in-design initiatives. DOE noted that resolving safety issues early in the design process is central to mitigating cost and schedule risks. DOE also identified the need for strong and persistent federal oversight of new design and construction projects. The results of this meeting assisted the Board and DOE in evaluating potential improvements in the timeliness of issue resolution. The information gained was used by the Board and DOE to develop its Joint Report to Congress, *Improving the Identification and Resolution of Safety Issues during the Design and Construction of DOE Defense Nuclear Facilities*, issued in July 2007.

Overall, the public meetings have led to:

- new expectations for identifying and resolving safety issues earlier in the design process,
- revision of the existing DOE Order for project management,
- commitments to revise the existing DOE Manual for project management and develop a new standard to implement a more rigorous approach to safety-in-design, and
- action by DOE and the Board that will provide for more timely identification of and resolution of technical issues.

The Board expects that these actions, when fully implemented, should lead to significant improvements in the design of new defense nuclear facilities.

Quarterly Report(s) on the Status of Significant Unresolved Issues with the Department of Energy's Design and Construction Projects. In response to a Congressional reporting requirement, the Board initiated actions to prepare quarterly reports to identify and report the status of significant unresolved issues to the Congressional defense committees. During FY 2007, the Board has issued three of these reports. Per the language in the authorization committees' Conference Report, quarterly reporting was to continue until the Board and DOE issued their joint report on a process for more timely identification and resolution of technical differences between the two agencies. The first quarterly report was widely hailed by Congress as being very beneficial in assisting their understanding of the issues. Congress subsequently requested that these reports continue to be prepared and issued by the Board through FY 2008.

Development of Geotechnical Probabilistic Seismic Hazard Curves for the SRS, LANL and Idaho Sites. The Board continued its review of DOE efforts to update probabilistic seismic hazard curves at several DOE sites. An update of the probabilistic seismic hazard analysis and development of seismic design ground motions was completed for the LANL site. The LANL probabilistic seismic hazard analysis benefited from a rigorous participatory peer review as the work was being accomplished. Results from the LANL probabilistic seismic hazard analysis indicate that the seismic hazard at LANL is greater than previously believed. LANL is in the process of evaluating the safety impact of this increase in the seismic hazard for each nuclear facility that is operating. Design basis earthquake ground motions have increased by about 50% at LANL. The Board is following DOE efforts to update probabilistic seismic hazard curves at SRS and the Nevada Test Site.

Waste Treatment Plant at the Hanford Site. The Board has continued its review of the design and construction of important-to-safety structures, systems, and components in the Waste Treatment Plant facilities. The design and construction of these facilities slowed significantly during this past year while DOE addressed technical and project management issues. The Board's activities primarily consisted of considering the resolution of previously identified issues.

- DOE significantly underestimated the impact of hydrogen hazards on pipes and small process vessels and components. At the urging of the Board, DOE has continued to evaluate design solutions to address the issue. DOE has now developed new design criteria that ensure the design remains fully protective of the public's health and safety.

- The Board continued to follow the status of the design and installation of fire-protective coatings on structural steel. DOE has now developed an adequate technical basis to justify not coating some structural steel. The technical basis and criteria developed should ensure that a fire will not adversely impact the structural integrity of the facilities. The Board will evaluate the implementation of the criteria to help ensure protection of the public's health and safety.

Integrated Waste Treatment Unit at the Idaho National Laboratory. The Board reviewed the design of the Integrated Waste Treatment Unit. Engineering disciplines used include: process safety, seismic and structural, electrical, fire protection, mechanical equipment, confinement ventilation, and instrumentation and control. In addition, the Board reviewed the final preliminary documented safety analysis, as well as software quality assurance for both engineering design and safety analysis codes, and software supporting the control of the waste treatment process. DOE is currently resolving several concerns identified. The Board issued a project letter at the beginning of 2007 documenting several items that would need to be addressed during final design to ensure safety. As a result, DOE is taking several actions including additional waste sampling to ensure radionuclide inventories supporting the safety analysis are conservative, and completion and documentation of the investigative effort into the root cause of an over-temperature event in the DOE pilot plant's charcoal bed.

Special Nuclear Material Component Requalification Facility at the Pantex Plant. The Board completed its final reviews and observed the operational readiness review of the Special Nuclear Material Component Requalification Facility. The Board has no outstanding issues with this facility and it is now operational.

Chemistry and Metallurgy Research Replacement Facility at the Los Alamos National Laboratory. The Board's review of the Chemistry and Metallurgy Research Replacement Facility identified weaknesses in the overall approach for selecting safety-related systems, and the establishment of conservative design criteria for these safety-related systems. The draft Preliminary Documented Safety Analysis does not establish an adequate facility safety strategy. The early identification of safety-related structures, systems and components to prevent and mitigate potential accidents is vital to the successful design of the project. The Board continues to review the preliminary design and at the end of preliminary design will undertake a detailed review of the overall safety strategy, as well as, assess the adequacy of design criteria and the design of safety-related systems.

Criticality Experiments Facility at the Nevada Test Site. The criticality testing capability from TA-18 at Los Alamos National Laboratory is being relocated to the Criticality Experiments Facility, which will be housed in the Device Assembly Facility at the Nevada Test Site. The Board noted to DOE deficiencies in the seismic analysis and potential structural issues associated with extensive cracking and water leaks in the Device Assembly Facility. The Board informed DOE that further testing of the concrete strength was prudent to fully evaluate the impact of the extensive cracking. As a result, DOE has now agreed to conduct further testing of the concrete strength to adequately evaluate the impact of the extensive cracking and ensure the facility can perform its design function. The Board also reviewed the preliminary documented safety analysis for the Criticality Experiments Facility and developed a significant number of comments and concerns. Many of these concerns were shared by DOE's Safety Basis Review Team, but were not being acted upon. As a result of Board interaction, the preliminary documented safety analysis was revised and improved.

Salt Waste Processing Facility at the Savannah River Site. The Board's review of the preliminary design of the Salt Waste Processing Facility identified deficiencies in the analysis of the facility's structural design to resist natural phenomena hazards. Further, the supporting geotechnical engineering report had not been issued. Completion of an adequate preliminary design is expected to provide a technically sound basis for establishing the project performance baseline and for initiating the final design. The Board was concerned that a significant redesign of the facility might be warranted. DOE commissioned an independent review team of subject matter experts to validate the Board's issues. This independent review team agreed with the Board and made recommendations to improve the preliminary design of the structure, as well as the analysis for the facility in the geotechnical and structural areas. As a result, DOE has redesigned the facility to ensure it will adequately confine hazardous materials.

Container Surveillance and Storage Capability Project and K-Area Interim Surveillance Project at the Savannah River Site. These two projects provide Savannah River Site additional long-term plutonium storage capacity and the ability to perform surveillance, stabilization, and packaging, capabilities that are required by DOE's long-term plutonium packaging standard. The Board completed its final reviews of the K Area Interim Surveillance Project, focusing on the documented safety analysis, criticality safety evaluation, and vault integrity testing to support a gaseous fire suppression system. No significant issues were identified and the K Area Interim Surveillance Project is now operational. The Board continued reviews of the preliminary design of the Container Surveillance and Storage Capability project, focusing on hazards analysis, criticality safety, fire protection, and an evaluation of the ability of existing and new structures to meet seismic performance requirements. The Board issued a letter in January 2007 communicating several concerns to DOE, including deficiencies in the hazards analysis and an inadequate basis for excluding nuclear incident monitors from the facility. As a result, DOE has revised the hazards analysis to address the Board's concerns and incorporated nuclear incident monitors into the design.

Uranium Processing Facility at the Y-12 National Security Complex. The Board reviewed the conceptual design and safety documentation for the project. The Board concluded that the conceptual design and safety documentation did not meet the expectations of the draft standard for incorporating safety in design. DOE conducted additional design work and elaborated on the project risks to address the Board comments. The Board believes the conceptual design is now adequate to proceed into preliminary design. The project received approval from DOE to proceed with preliminary design.

Plutonium Storage at the Savannah River Site. In 2003, Congress tasked the Board to conduct a study of the adequacy of the K-Area Materials Storage (KAMS) facility and related support facilities, such as Building 235-F (235-F), at Savannah River Site. A report documenting this study was issued in December 2003. The Board proposed nine actions it considered necessary to enhance safety, reliability, and functionality of the plutonium storage facilities at Savannah River Site. Congress also requested an annual report on the status of the proposals in this report. In June 2007, the Board issued its annual update to Congress. Based in part on extensive proposals, DOE decided against using 235-F and will only store plutonium in the KAMS facility. The Board agreed with this decision. DOE agreed with the Board's proposals to upgrade the KAMS facility. In 2007, DOE completed the last remaining upgrade to the fire protection system in the facility. The addition of a fire detection system permits plutonium to be stored safely in the KAMS facility until dispositioned by DOE.

PERFORMANCE GOAL 4: NUCLEAR SAFETY PROGRAMS AND ANALYSIS

DOE regulations, requirements, and guidance are developed, implemented, and maintained; and safety programs at defense nuclear facilities are established and implemented; as necessary to protect adequately the health and safety of the workers and the public.

FY 2007 Performance Objectives:

The Board will continue to assess the adequacy of proposed changes to DOE directives to ensure that any revisions are appropriate and adequate. The results of reviews completed by the Board will be provided to DOE for action. The Board anticipates that approximately 20 DOE directives that may impact public and worker health and safety require review, of which two or three are likely to require significant Board and staff interaction to ensure satisfactory resolution of potential issues. In those rare cases in which new directives are determined to be required, the Board will work with DOE to ensure that the applicable documents are developed adequately. The Board also expects to continue its involvement in the efforts of the National Nuclear Security Administration (NNSA) to establish its own directive system. It is estimated that 15 NNSA directives will also require review. As a result of these reviews, new or modified health and safety directives will be issued in an enhanced form, resulting in improved safety through standardized requirements and guidance that provide for adequate protection of the workers and the public.

The Board will continue its reviews of DOE's implementation of Integrated Safety Management (ISM), as well as ongoing efforts to make ISM more effective. At least five reviews will be completed. Candidates for review include:

- Activity-level ISM implementation at sites with performance indicators judged to have higher than expected rates of abnormal occurrences related to worker protection.
- Validation of at least one site office review of activity-level ISM.
- Validation of at least one ISM review by the DOE Office of Independent Oversight and Performance Assurance.
- The Board will continue to evaluate the implementation and effectiveness of DOE's efforts to satisfy the intent of Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*. In this regard, the Board will conduct safety reviews at selected NNSA and EM sites to verify that the commitments associated with the Recommendation have been fully implemented.
- Implementation of Federal line oversight in DOE Headquarters, Field and contractor organizations.
- Implementation and effectiveness of ISM at defense nuclear facilities.

The Board has noted that considerable progress has been made in the implementation of ISM, but that continued DOE efforts are necessary to maintain ISM systems and ensure continuous improvement across the complex. Specific functional areas will be sampled to a greater depth, such as training and qualification, quality assurance, nuclear criticality safety, software quality assurance, conduct of operations, configuration management, maintenance management, and readiness preparations. As a result of these reviews, DOE will provide an adequate approach and schedule for resolution of identified issues that supports safe operation of defense nuclear facilities.

The Board anticipates that the effort to complete the revised implementation plan associated with Recommendation 2004-1, *Oversight of Complex, High Hazard Nuclear Operations*, will require significant Board and staff interaction with multiple federal and contractor agencies.

The Board will review the progress on relocation of critical experiment capability to the Nevada Test Site, review results of Nuclear Criticality Safety (NCS) site reviews by DOE, and monitor DOE efforts to fill site office NCS oversight positions.

The Board will continue to follow the progress by DOE to implement Board Recommendation 2004-2, *Active Confinement Systems.*

FY 2007 Measured Performance:

DOE Directives. As part of its ongoing review of new and revised DOE directives, the Board and its staff evaluated and provided constructive critiques of 30 directives associated with, but not limited to nuclear design criteria, maintenance management, worker protection, emergency management, and project management. At year's end, both staffs were in the process of resolving issues on 15 pending directives to improve the content, clarity, and consistency in safety requirements and guidance. Examples of completed directives include:

- DOE-Standard-1183, *Nuclear Safety Specialist Functional Area Qualification Standard*
- DOE-Standard-1185, *Nuclear Explosives Safety Study Functional Area Qualification Standard*
- DOE Manual 460.2-1A, *Radioactive Material Transportation Practices Manual*
- DOE Order 410.1, *Baseline Nuclear Safety Requirements*
- DOE Order 226.1A, *Implementation of Department of Energy Oversight Policy*
- DOE-Standard-SAFT-0113, *Preparation of Safety Basis Documents for Transuranic Waste Facilities*
- DOE Guide 420.1-3, *Implementation Guide for DOE Fire Protection and Emergency Services Programs for Use with DOE O 420.1B, Facility Safety*

Administrative Controls. In Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*, the Board identified the need for DOE to improve its guidance and expectations with respect to important administrative controls at defense nuclear facilities. As a result of the Board's Recommendation, DOE developed and implemented a plan to improve the reliability and effectiveness of administrative controls that serve safety functions. DOE developed a new standard governing the development and implementation of specific administrative controls in the defense nuclear complex. Further, DOE made significant revisions to the "safe harbor" methodologies used to

comply with 10 CFR 830, *Nuclear Safety Management*, to codify and incorporate the provisions of the Recommendation. In early 2007, DOE indicated that all the commitments associated with this issue had been met and requested closure of the Recommendation. However, following a series of effectiveness reviews, the Board identified a number of weaknesses that indicated that the Department's implementation of the Recommendation had not been fully effective. The Board will work to further evaluate the effectiveness and implementation of DOE's efforts to satisfy these commitments in 2008.

Use of Quantitative Risk Assessment Methodologies. The Board continues to follow DOE's activities associated with the use of quantitative risk assessment at defense nuclear facilities. Previously, the Board conducted a comprehensive assessment of DOE's policies, programs, processes, and procedures with respect to the use of quantitative risk assessment and related methodologies. The Board's review suggested that DOE and its contractors have employed quantitative risk assessment in a number of activities, including the development of documented safety analyses and other facility-level decision making activities. The precise use, as well as the level of formality of these assessments, varied over a wide range. As a result of the Board's observations and concerns, DOE has recently developed a new draft policy and implementation guide to address the use of risk methodologies in the defense nuclear complex. The Board will continue to oversee DOE's progress in fully developing an effective policy, along with useful implementing guidance, to govern the use of risk assessment methodologies at DOE facilities.

Justifications for Continuing Operations. The Board reviewed DOE's processes and practices associated with the use of justifications for continuing operations (JCO) at defense nuclear facilities. This review encompassed the guidance and requirements associated with JCO requests, review, and approval, along with a survey of actual JCOs in effect at selected facilities. The Board compared DOE's use of JCOs with approaches used elsewhere in the nuclear industry. The Board found a number of weaknesses in the JCO process and its implementation at defense nuclear facilities. In particular, it was noted that DOE has not established adequate requirements, expectations, and guidance for the use of JCOs. In general, DOE's processes and practices with respect to JCOs are not in conformance with generally accepted nuclear industry processes, and a number of facilities appear to be in violation of even these deficient processes and practices. The Board will continue to work with DOE to develop and implement a satisfactory approach for the use of JCOs in the defense nuclear complex.

DOE Standard 1027, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23,* Nuclear Safety Analysis Reports, Change Notice 1. In June 2006, the Board issued a letter identifying numerous deficiencies with DOE-Standard-1027-92, and requested that DOE issue a report addressing these and other potential issues associated with the standard. As a result of this letter, DOE closely examined issues associated with DOE-Standard-1027 and its implementation in an effort that involved contractors from across the complex as well as headquarters site personnel. The working group issued supplemental guidance to address the majority of the issues raised in the June 2006 Board letter, including exclusion of sealed sources from facility inventory for hazard categorization purposes. DOE has further committed to the Board to pursue a revision to the standard to catalyze clear and consistent implementation expectations in the document.

Recommendation 2004-2. The Board issued Recommendation 2004-2, *Active Confinement Systems*, in December 2004, to ensure that a reliable and effective control would be available to mitigate the consequences of potential accidents at defense nuclear facilities. During the past year, DOE completed detailed reviews of about a dozen high priority hazard category 2 facilities using the performance criteria provided in the ventilation system evaluation guidance document that was issued in February 2006. These facilities included the Container Surveillance and Storage Capability, Plutonium Disposition Project, Actinide Removal Process, and Pit Disassembly and Conversion Facility at Savannah River Site; New Waste Calcine Facility and Advanced Mixed Waste Treatment Facility at Idaho National Laboratory; Depleted Uranium Hexafluoride Conversion Facilities at Paducah and Portsmouth; Waste Treatment and Immobilization Plant at Hanford; Technical Area-55 Plutonium Facility at Los Alamos National Laboratory; and Uranium Processing Facility and Building 9212 at the Y-12 National Security Complex. These evaluations compared certain functional performance capabilities of the ventilation systems for these facilities against the identified safety related performance criteria of the guidance document. As a result, weaknesses or gaps were identified, and system modifications were proposed to meet the expectations of the Recommendation. Several of these facilities have already committed to making the necessary modifications to improve the reliability and performance of their active confinement ventilation systems. The remainder awaits the Program Secretarial Officer's review and approval of the necessary modifications.

Recommendation 2000-2. Recommendation 2000-2, *Configuration Management, Vital Safety Systems*, was issued to DOE on March 8, 2000, and an Implementation Plan was accepted on December 14, 2000. The plan called for an initial assessment and inventory of the vital safety systems throughout the defense nuclear complex, followed by the development of a process to ensure that those assessments would be repeated periodically. The Implementation Plan also required the establishment (at each site) of qualified federal and contractor employees cognizant of the site's vital safety systems. Because of the great importance of the vital safety systems in achieving and maintaining a high level of safety on the DOE sites, the Board's staff made frequent visits to evaluate DOE's progress in implementing the Recommendation. As a result of the progress made in response to the Recommendation, the Board closed the Recommendation in a letter dated August 8, 2007. Because of the importance of these systems to safety in the defense nuclear facilities, however, the Board will request, separately and as appropriate, that relevant DOE programs provide periodic reports or briefings on the implementation and maintenance of their supporting configuration management programs.

Readiness Reviews. As a result of concerns expressed by the Board regarding the proper implementation of DOE Order 425.1C, *Startup and Restart of Nuclear Facilities*, DOE conducted a comprehensive review of startup and restart procedures, as well as their implementation at defense nuclear facilities. To ensure a more rigorous and conservative implementation of DOE Order 425.1C, and to address other complex-wide startup and restart issues, DOE formed a readiness review working group. Specific and ongoing working group actions include revising and reinvigorating readiness review training for DOE and contractors; clarifying certain aspects of the Order including definitions, conduct of a readiness review, and the process for readiness review notification; and updating pertinent readiness review examples in associated directives. The Board continues to monitor the working group's efforts to improve the quality of the directives related to startup of new and substantially modified facilities.

Recommendation 2007-1. In April 2007, the Board issued Recommendation 2007-1, *Safety-Related In-Situ Nondestructive Assay of Radioactive Materials*. The Recommendation was developed to ensure that in-situ measurements, when used to determine compliance with safety limits, would be done in accordance with recognized industry standards and contain appropriate quality assurance elements. The Recommendation also required DOE to establish other requirements via the directives system for proper execution of such measurements within site-level programs, including: personnel training and qualification, standard techniques for addressing measurement uncertainty, and periodic assessments of the need for new technology. DOE accepted the Recommendation in June 2007, and is currently working on an implementation plan to address the concerns identified by the Board.

Criticality Safety. Concerns expressed by the Board regarding the lack of NCS site reviews led DOE to establish a formal program to monitor contractor and federal NCS programs across the complex. The baseline reviews, which used senior contractor and federal NCS personnel, are now complete. The results of these reviews have been or will be examined by the Board as the reports are finalized. The Board also provided input to the latest revision of DOE-Standard-3007-2007, *Guidelines for Preparing Criticality Safety Evaluations at Department of Energy Nonreactor Nuclear Facilities*, which was issued in early 2007, and to supplemental guidance issued for DOE-Standard-1027, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Report*. The Board conducted reviews of NCS evaluations, contractor NCS programs, and federal oversight at Hanford, the Savannah River Site, and Los Alamos National Laboratory. The Board continues to monitor DOE's progress in assuring criticality safety at defense nuclear facilities.

Recommendation 2004-1. In response to Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*, DOE completed the following actions in 2007: 1) fully implemented the Central Technical Authorities function, with associated technical support staff managed by the Chief of Defense Nuclear Safety for NNSA and the Chief of Nuclear Safety for the remainder of DOE; 2) issued a new DOE manual on integrated safety management; 3) created an ISM Champions Council, reporting to the Deputy Secretary, and responsible for reinvigorating ISM in the Complex; 4) performed program office self-assessments of safety function assignments at the program office level and defined criteria for the delegation of authority; and 5) issued an integrated safety management system description for each of the program offices. DOE also completed several milestones associated with the corrective action plan for Federal Technical Capabilities, as delineated in the discussion of Technical Competence below. Based on a reevaluation of commitments, DOE revised the 2004-1 Implementation Plan and moved responsibility for the Office of Nuclear Safety Research from the Office of Environment, Safety and Health to NNSA. NNSA also continues to work on a modified line oversight contractor assurance system, which is intended to focus more NNSA oversight on the facilities where a low-probability-high-hazard accident is credible, while relying on the contractor to oversee the remainder of the facilities. The Board will expend significant effort in the oversight of this transformation to ensure that safety of defense nuclear facilities is not jeopardized.

Implementation of ISM: Activity-Level Work Planning. In 2006, NNSA completed work on its expectations for contractors' work planning and control processes, as well as criteria and review approach documents to comprehensively assess these processes. Based upon these documents and similar criteria and review approach documents developed by DOE's Office of Environmental Management, reviews were conducted at each of the sites to determine the baseline state of the work planning and control

process. From this baseline, DOE has committed to take actions that will improve work planning and control at the sites as a part of the Recommendation 2004-1 Implementation Plan. During 2007, the Board staff reviewed work planning processes at three DOE sites. The results of these reviews indicate that the oversight actions that were to be taken may not have been fully institutionalized. Oversight of this area will require significant effort during 2008 in order to improve performance.

DOE Technical Capability. In response to the Board's Recommendation 2004-1, DOE is making progress in a number of areas:

- DOE has completed a total of 16 of the 28 actions from the original Corrective Action Plan to improve DOE's federal technical capability, as noted in the implementation plan for Recommendation 2004-1.

- DOE used the lessons learned from a February 2006 Senior Technical Safety Manager (STSM) pilot course to improve the course held in November 2006, and then instituted a Department-wide, formal and rigorous final testing program to validate STSM qualification. DOE also strengthened its qualification criteria with mandatory performance activities through a significant revision to DOE-STD-1075, *Senior Technical Safety Manager Functional Area Qualification Standard*, re-issued in November 2006.

- DOE has incorporated former facility representatives into its integrated project teams, with noticeable success for the Highly Enriched Uranium Materials Facility at Y-12 National Security Complex and the Waste Treatment and Immobilization Plant at Hanford.

Chapter 3
CFO Letter, Auditor's Report and Financial Statements

CFO LETTER

I am pleased to report that the Board's FY 2007 financial statements received an unqualified opinion from its independent auditors, its second unqualified opinion since its FY2004 financial statements were initially audited pursuant to the Accountability of Tax Dollars Act (ATDA) of 2002. The financial statements that follow were prepared and audited as part of this performance and accountability report within 45 days after the end of the fiscal year. To ensure that scarce resources are dedicated to fulfilling the demanding health and safety oversight mission, the DNFSB has adopted the "economies of scale" philosophy for obtaining needed administrative support services and "contracts" (through an Interagency Agreement) with the General Services Administration (GSA)'s Heartland Finance Center to act as its accounting services provider. The Board's financial staff worked diligently with our GSA accountants in preparing our FY 2007 financial statements and providing the necessary supporting documentation to our auditors, and credit should be given to both those organizations for achieving these accomplishments.

Compliance with Laws and Regulations

The auditors tested the Board's compliance with certain provisions of laws and regulations, non-compliance with which could have a direct and material effect on the determination of financial statement amounts, and certain other laws in regulations specified in OMB Bulletin 07-04, *Audit Requirements for Federal Financial Statements*. The auditors found no instances of non-compliance with such laws or regulations.

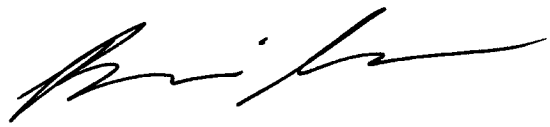
The auditors' FY 2006 report found that the Board was non-compliant with FMFIA as it did not have procedures requiring documentation to support its annual FMFIA assessments. I am pleased to report that the Board is now compliant with FMFIA as a result of procedures developed and implemented in FY 2007 which require the necessary management assessments.

Internal Controls

In planning and performing the financial statements audit, the independent auditors considered the Board's internal controls over financial reporting by obtaining an understanding of our internal controls, determining if internal controls had been placed in operation, assessing controls risk, and performing tests of controls. Testing of internal controls was limited to those controls necessary to achieve objectives described in OMB Bulletin 07-04. The auditors noted there are several significant weaknesses in the Board's management of information systems which together constitute a significant deficiency. This was also a prior year finding and although the auditors recognized "substantial progress" in addressing known information technology weaknesses, they noted additional improvement is required. The specific weaknesses and the Board's response are included in the auditors report.

In general, the Board agrees with the auditor's findings and recommendations in the area of internal control of information systems. Most of these control weaknesses are known to the Board, and are the result of a lack of written policies and procedures to guide ongoing information technology operations. As a small agency with a limited IT budget, the Board has focused its resources on providing reliable IT support operations, and recognizes that the preparation of assessments and procedures has not historically received priority attention. The Board started a formal Certification and Accreditation program in FY 2007 while continuing to maintain its excellent delivery of timely and reliable IT services to the Board and outside customers. The Board plans to certify and accredit its systems in FY 2008 in order to resolve this deficiency.

The auditor's report, together with accompanying reports on compliance with laws and regulations, and internal control are included in their entirety in this Chapter.



Brian Grosner, Chief Financial Officer

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Chairman of the Board
Defense Nuclear Facilities Safety Board

INDEPENDENT AUDITOR'S REPORT

We audited the Balance Sheets of the Defense Nuclear Facilities Safety Board (DNFSB) as of September 30, 2007, and 2006, and the related Statements of Net Cost, Changes in Net Position, and Budgetary Resources for the years then ended. These financial statements are the responsibility of DNFSB's management. Our responsibility is to express an opinion on the financial statements based on our audits.

We conducted our audits in accordance with auditing standards generally accepted in the United States of America; standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and Office of Management and Budget (OMB) Bulletin 07-04, *Audit Requirements for Federal Financial Statements*. These standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting amounts and disclosures in the financial statements. An audit also includes assessing accounting principles used and significant estimates made by management, as well as evaluating overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of DNFSB as of September 30, 2007, and 2006, and its net costs, changes in net position, and budgetary resources for the years then ended in conformity with accounting principles generally accepted in the United States of America.

Management's Discussion and Analysis (MD&A) and other accompanying information are not required as part of DNFSB's basic financial statements. For MD&A, which is required by OMB Circular A-136, *Financial Reporting Requirements*, and the Federal Accounting Standards Advisory Board's Statement of Federal Financial Accounting Standards No. 15, *Management's Discussion and Analysis*, we made certain inquiries of management and compared the information for consistency with DNFSB's audited financial statements and against other knowledge we obtained during our audits. For other accompanying information, we compared information with the financial statements. We did not audit the MD&A or other accompanying information and therefore express no opinion on them.

In accordance with *Government Auditing Standards*, we have also issued separate reports dated November 2, 2007, on our consideration of DNFSB's internal control over financial reporting and on our tests of its compliance with certain provisions of laws and regulations. The purpose of those reports is to describe the scope of our testing of internal control over financial reporting and compliance and results of that testing, and not to provide an opinion on internal control over financial reporting or on compliance. Those reports are an integral part of an audit performed in accordance with *Government Auditing Standards* and should be considered in assessing results of our audits.

COTTON & COMPANY LLP

Colette Y. Wilson, CPA
Partner

November 2, 2007
Alexandria, Virginia

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Chairman of the Board
Defense Nuclear Facilities Safety Board

INDEPENDENT AUDITOR'S REPORT ON COMPLIANCE WITH LAWS AND REGULATIONS

We audited the Balance Sheets of the Defense Nuclear Facilities Safety Board (DNFSB) as of September 30, 2007, and 2006, and the related Statements of Net Cost, Changes in Net Position, and Budgetary Resources for the years then ended. We have issued our report thereon dated November 2, 2007. We conducted our audit in accordance with auditing standards generally accepted in the United States of America; standards applicable to financial audits contained in *Government Auditing Standards,* issued by the Comptroller General of the United States; and Office of Management and Budget (OMB) Bulletin 07-04, *Audit Requirements for Federal Financial Statements.*

DNFSB management is responsible for complying with laws and regulations applicable to the agency. As part of obtaining reasonable assurance about whether DNFSB's financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws and regulations, noncompliance with which could have a direct and material effect on the determination of financial statement amounts, and certain other laws and regulations specified in OMB Bulletin 07-04. Providing an opinion on compliance with those provisions was not, however, an objective of our audit, and accordingly, we do not express such an opinion.

Results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards* and OMB Bulletin No. 07-04.

This report is intended solely for the information and use of DNFSB management, others within DNFSB, OMB, and Congress. It is not intended to be and should not be used by anyone other than these specified parties.

COTTON & COMPANY LLP

Colette Y. Wilson, CPA
Partner

November 2, 2007
Alexandria, Virginia

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Chairman of the Board
Defense Nuclear Facilities Safety Board

INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL

We audited the Balance Sheets of the Defense Nuclear Facilities Safety Board (DNFSB) as of September 30, 2007, and 2006, and the related Statements of Net Cost, Changes in Net Position, and Budgetary Resources for the years then ended. We have issued our report thereon dated November 2, 2007. We conducted our audits in accordance with auditing standards generally accepted in the United States of America; standards applicable to financial audits contained in *Government Auditing Standards,* issued by the Comptroller General of the United States; and Office of Management and Budget (OMB) Bulletin 07-04, *Audit Requirements for Federal Financial Statements.*

In planning and performing our audits, we considered DNFSB's internal control over financial reporting as a basis for designing our auditing procedures for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the DNFSB's internal control over financial reporting. Accordingly, we do not express an opinion on the effectiveness of DNFSB's internal control over financial reporting.

A control deficiency exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent or detect misstatements on a timely basis. A significant deficiency is a control deficiency, or combination of control deficiencies, that adversely affects the entity's ability to initiate, authorize, record, process, or report financial data reliably in accordance with generally accepted accounting principles such that there is more than a remote likelihood that a misstatement of the entity's financial statements that is more than inconsequential will not be prevented or detected by the entity's internal control.

A material weakness is a significant deficiency, or combination of significant deficiencies, that results in more than a remote likelihood that a material misstatement of the financial statements will not be prevented or detected by the entity's internal control.

Our consideration of internal control over financial reporting was for the limited purpose described above and would not necessarily identify all deficiencies in internal control that might be significant deficiencies or material weaknesses. We did not identify any deficiencies in internal control over financial reporting that we consider to be material weaknesses, as defined above. We did, however, note one matter involving internal control and its operation that we considered to be a significant deficiency.

INFORMATION SYSTEMS

DNFSB's internal controls over information systems require improvement. DNFSB made substantial progress in addressing known information technology weaknesses during Fiscal Year (FY) 2007, such as implementing a Certification & Accreditation (C&A) program. As part of our review in accordance with *Federal Information System Controls Audit Manual* (FISCAM), we identified weaknesses in DNFSB's management of information systems. The most significant of these issues are described below.

Oversight of Outsourced Information Systems

DNFSB has not ensured that third-party service-provider controls are adequate and has not implemented customer-consideration controls described in the SAS 70 report for its major financial systems, Pegasys and webTA.

DNFSB made progress during FY 2007. It incorporated additional language in the Memoranda of Understanding with the General Services Administration (GSA), which hosts the Pegasys system, and the Bureau of the Public Debt (BPD), which hosts the webTA system. This additional language addresses how DNFSB data will be protected at these outside entities.

While DNFSB has made progress in this area, it still needs to identify, document, and evaluate its own controls for outsourced systems to close this issue. While the C&A process is not yet complete, as described below, DNFSB plans to incorporate the documentation and evaluation of controls for outsourced systems within the new C&A process.

Recommendation: We recommend that DNFSB improve oversight of outsourced information systems by implementing procedures to ensure that internal controls at third-party service providers are adequate and complete.

Certifications and Accreditations for Major Information Systems

DNFSB has not taken procedures to assure that major information systems, such as the General Support System (GSS) and major applications, are appropriately certified and accredited. DNFSB has not:

- Subjected these systems to C&A processes.
- Ensured that the systems have been authorized or accredited by managers whose mission they support.
- Performed and documented risk assessments.

In addition, DNFSB has not documented a system security plan for GSS that fully addresses topics prescribed by OMB Circular A-130, *Management of Federal Information Resources*, and National Institute of Standards and Technology (NIST) Special Publication (SP) 800-18, *Guide for Developing Security Plans for Federal Information Systems*, for general support systems.

Further, senior management did not initiate prompt action to correct known deficiencies. Of 31 recommendations listed in the Plan of Action and Milestones (POA&M) report, 23 remain open.

As a result of these conditions, management increases the risk that sensitive data are not adequately protected at all times. We consider this issue to also be a significant deficiency under the Federal Information Security Management Act.

DNFSB made progress during FY 2007. It initiated the C&A implementation process by obtaining senior management commitment to the effort, assigning roles and responsibilities, and developing a C&A implementation working group. DNFSB also defined system boundaries and categorized its GSS as a Moderate system using NIST guidelines. DNFSB is currently reviewing the list of mandatory security controls for Moderate systems from NIST SP 800-53, *Recommended Security Controls for Federal Information Systems.*

Recommendations: We recommend that DNFSB continue the C&A process to ensure that it meets guidance provided by NIST SP 800-37, *Guide for the Security Certification and Accreditation of Federal Information Systems*. As part of a comprehensive C&A process, we recommend that management ensure that:

1. All general support systems and major applications undergo the C&A process every 3 years or as major changes occur.

2. Risk assessments are performed for each system in accordance with NIST SP 800-30, *Risk Management Guide for Information Technology Systems*. The risk assessment for GSS should include controls over DNFSB facilities.

3. System security plans are documented and maintained for each system in accordance with NIST SP 800-18, *Guide for Developing Security Plans for Federal Information Systems.*

4. Management maintains a list of known vulnerabilities in systems (POA&M) and initiates prompt corrective action.

MANAGEMENT RESPONSE

DNFSB management's response follows:

> *The Board agrees with the independent auditor's findings that the lack of accreditation, for both internal systems owned and operated by the DNFSB and third-party service provider systems that process DNFSB information, presents a risk that sensitive DNFSB data may not be adequately protected.*
>
> *In Fiscal Year (FY) 2007, the DNFSB continued to make significant progress on implementing its internal Certification & Accreditation (C&A) process. Steps completed in FY 2007 to improve control over third-party service provider systems include incorporating more stringent security control requirements in contractual agreements, increasing the focus on the C&A efforts performed by third-party service providers on their own systems, and working to develop internal controls to ensure all third-party service provider customer consideration controls are properly implemented.*
>
> *Steps completed to improve control over the DNFSB's internal systems includes the on-going progress in implementing internal C&A policies and procedures that are fully compliant with all relevant National Institute of Standards and Technology (NIST) guidance. Steps included in FY 2007 included re-validating the C&A roles and responsibilities, impact levels of internal systems, system boundaries, and required security controls. These steps have been documented in an updated System Security Plan (SSP) for the DNFSB's GSS. Once this SSP is finalized, the Board will be able to test the effectiveness of all implemented security controls. Completing this milestone will also provide the DNFSB with a much more accurate set of Plans of Actions & Milestones (POA&M) for any issues that remain, allowing senior management to more accurately track and correct known deficiencies and make an accreditation decision. After these actions have been taken, the DNFSB will be able to make an accreditation decision that accurately reflects the current state of DNFSB systems and the risks posed to DNFSB information by continuing to use these systems.*

With respect to internal control related to significant performance measures included in Management's Discussion and Analysis, we obtained an understanding of the design of internal control relating to existence and completeness assertions, as required by OMB Bulletin 07-04. Our procedures were not designed to provide assurance on internal control over reported performance measures, and, accordingly, we do not express such an opinion.

We noted certain matters involving internal control and its operation that we will report to DNFSB's management in a separate letter.

This report is intended solely for information and use of DNFSB management, others within DNFSB, OMB, and Congress. It is not intended to be and should not be used by anyone other than these specified parties.

COTTON & COMPANY LLP

Colette Y. Wilson, CPA
Partner

November 2, 2007
Alexandria, Virginia

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

APPROPRIATED FUND

FINANCIAL STATEMENTS

As Of and For the Years Ended September 30, 2007 and 2006

DEFENSE NUCLEAR FACILITY SAFETY BOARD

BALANCE SHEET

As Of September 30, 2007 and 2006

		2007	2006
Assets:			
Intragovernmental:			
Fund Balance With Treasury	(Note 2)	$ 9,149,400	$ 8,479,577
Other	(Note 3)	263,000	
Total Intragovernmental		9,412,400	8,479,577
Accounts Receivable, net	(Note 4)	74,535	86,828
General Property, Plant and Equipment, Net	(Note 5)	371,104	164,975
Total Assets		$ 9,858,038	$ 8,731,380
Liabilities:	(Note 6)		
Intragovernmental:			
Accounts Payable	(Note 7)	$ 26,296	$ 24,827
Employee Benefits	(Note 8)	$ 106,258	133,401
Total Intragovernmental		132,554	158,228
Accounts Payable		676,787	570,636
Other	(Note 9)		
Accrued Funded Payroll and Leave		602,130	533,606
Unfunded Leave		794,541	830,076
Worker's Compensation	(Note 10)	8,941	5,376
Total Liabilities		2,214,952	2,098,122
Net Position:			
Unexpended Appropriations - Other Funds		8,836,029	8,057,072
Cumulative Results of Operations - Other Funds		(1,194,943)	(1,423,814)
Total Net Position		7,643,086	6,633,258
Total Liabilities and Net Position		$ 9,858,038	$ 8,731,380

*Amounts may be off by a dollar due to rounding

The accompanying notes are an integral part of these statements.

DEFENSE NUCLEAR FACILITY SAFETY BOARD

STATEMENT OF NET COST

For The Years Ended September 30, 2007 and 2006

		2007	2006
Program Costs:			
DNFSB:			
Gross Costs	(Note 12)	$ 21,531,334	$ 20,618,579
Net Program Costs		21,531,334	20,618,579
Net Cost of Operations		$ 21,531,334	$ 20,618,579

*Amounts may be off by a dollar due to rounding.

The accompanying notes are an integral part of these statements.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

STATEMENT OF CHANGES IN NET POSITION

For The Years Ended September 30, 2007 and 2006

	2007	2006
Cumulative Results of Operations:		
Beginning Balances	$ (1,423,814)	$ (1,511,574)
Budgetary Financing Sources:		
Appropriations Used	21,133,097	20,125,047
Other	-	4,286
Other Financing Resources (Non-Exchange):		
Imputed Financing	627,108	577,008
Total Financing Sources	21,760,205	20,706,339
Net Cost of Operations (+/-)	21,531,334	20,618,579
Net Change	228,871	87,760
Cumulative Results of Operations	$ (1,194,943)	$ (1,423,814)
Unexpended Appropriations:		
Beginning Balances	$ 8,057,072	$ 8,370,439
Budgetary Financing Sources:		
Appropriations Received	21,914,054	22,032,000
Other Adjustments	-	(220,320)
Appropriations Used	(21,133,097)	(20,125,047)
Total Budgetary Financing Sources	780,957	1,686,633
Total Unexpended Appropriations	8,838,029	8,057,072
Net Position	$ 7,643,086	$ 6,633,258

*Amounts may be off by a dollar due to rounding.

The accompanying notes are an integral part of these statements.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

STATEMENT OF BUDGETARY RESOURCES

For TheYears Ended September 30, 2007 and 2006

	2007	2006
Budgetary Resources:		
Unobligated Balance:		
Beginning of Period	$ 3,443,743	$ 1,389,721
Recoveries of Prior Year Unpaid Obligations	956,307	693,709
Budget Authority:		
Appropriations Received	21,914,054	22,032,000
Earned		
Collected	19,528	3,704
Subtotal	$ 21,933,582	$ 22,035,704
Permanently Not Available		(220,320)
Total Budgetary Resources	$ 26,333,632	$ 23,898,813
Status of Budgetary Resources:		
Obligations Incurred		
Direct	$ 22,382,741	$ 20,445,071
Subtotal	$ 22,382,741	$ 20,445,071
Unobligated Balances		
Apportioned	2,975,056	2,754,942
Subtotal	$ 2,975,056	$ 2,754,942
Unobligated Balances - Not Available	975,836	698,801
Total Status of Budgetary Resources	$ 26,333,632	$ 23,898,813
Change in Obligated Balances:		
Obligated Balance, Net:		
Unpaid Obligations, Brought Forward, October 1	$ 5,035,834	$ 4,962,349
Total, Unpaid Obligated Balance, Brought Forward, Net	$ 5,035,834	$ 4,962,349
Obligations Incurred	22,382,741	20,445,071
Gross Outlays (-)	(21,263,759)	(19,667,876)
Recoveries of Prior-Year Unpaid Obligations, Actual (-)	(956,307)	(693,709)
Obligated Balance, Net, End of Period:		
Unpaid Obligations (+) (Note 13)	5,198,508	5,035,834
Total, Unpaid Obligated Balance, Net, End of Period	$ 5,198,508	$ 5,035,834
Net Outlays:		
Gross Outlays (+)	21,263,759	19,667,876
Offsetting Collections (-)	(19,528)	(3,704)
Net Outlays (Note 14)	$ 21,244,231	$ 19,664,173

*Amounts may be off by a dollar due to rounding.

The accompanying notes are an integral part of these statements.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

APPROPRIATED FUND

Note 1 – Significant Accounting Policies

(a) Reporting Entity

The Defense Nuclear Facilities Safety Board (Board) is an independent Federal government agency with responsibility for the oversight of the Department of Energy (DOE)'s defense nuclear facilities located throughout the United States. The Board is directed by a Chairman and four members appointed by the President. The Board's mission as described by the Atomic Energy Act is to ensure that the public health and safety are adequately protected at the DOE defense nuclear facilities.

(b) Basis of Presentation

These financial statements have been prepared from the accounting records of the Board in accordance with generally accepted accounting principles (GAAP) as promulgated by the Federal Accounting Standards Advisory Board (FASAB), and OMB (Office of Management and Budget) Circular A-136, "Financial Reporting Requirements." GAAP for Federal entities is the hierarchy of accounting principles prescribed in the American Institute of Certified Public Accountant's (AICPA) Statement on Auditing Standards No. 91, *Federal GAAP Hierarchy.*

Circular A-136, requires agencies to prepare principal statements, which include a Balance Sheet, a Statement of Net Cost, a Statement of Changes in Net Position, and a Statement of Budgetary Resources. Effective for FY 2007 a Statement of Financing is no longer required (the information formerly presented in the Statement of Financing (reconciliation of budgetary resources to net cost of operations) is included in Note 16). The balance sheet presents, as of September 30, 2007, amounts of future economic benefits owned or managed by Board (assets), amounts owed by Board (liabilities), and amounts, which comprise the difference (net position). The Statement of Net Cost reports the full cost of the Board's operations and the Statement of Budgetary Resources reports Board's budgetary activity.

(c) Basis of Accounting

Transactions are recorded on the accrual accounting basis in accordance with OMB Circular A-136. Under the accrual basis of accounting, revenues are recognized when earned, and expenses are recognized when a liability is incurred, without regard to receipt or payment of cash. The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting period. Actual results may differ from those estimates.

(d) Revenues and Other Financing Sources

The Board receives its funding needed to support its programs through congressional appropriations. Appropriated funds are received annually and remain available until expended (i.e., no year funds). None of the appropriations are "earmarked" funds.

An imputed financing source is recognized to offset costs incurred by the Board and funded by another Federal source (see notes 1(i) and 8).

(e) Assets and Liabilities

Intra-governmental assets and liabilities arise from transactions between the Board and other Federal entities.

Funds with the U.S. Treasury compose the majority of assets on the Board's balance sheet. All other assets result from activity with non-federal sources.

Liabilities represent amounts that are likely to be paid by the Board as a result of transactions that have already occurred. The accounts payable portion of liabilities consist of amounts owed to federal agencies and commercial vendors for goods, services, and other expenses received but not yet paid.

Liabilities covered by budgetary or other resources are those liabilities of the Board for which Congress has appropriated funds, or funding is otherwise available to pay amounts due. Liabilities not covered by budgetary or other resources represent amounts owed in excess of available congressionally appropriated funds or other amounts. The liquidation of liabilities not covered by budgetary or other resources is dependent on future congressional appropriations or other funding.

(f) Fund Balance with the U.S Treasury

The U.S. Treasury processes the Board's receipts and disbursements. Funds with the U.S. Treasury are cash balances from appropriations as of the fiscal year-end from which the Board is authorized to make expenditures and pay liabilities resulting from operational activity.

(g) Property, Plant, and Equipment (PPE)

PPE consists of capitalized equipment, furniture and fixtures, and software. There are no restrictions on the use or convertibility of property, plant, or equipment.

The Board capitalizes PPE with a useful life of at least two (2) years and individually costing more than $10,000 ($25,000 for leasehold improvements). Bulk purchases of lesser value items are capitalized when the cost is $25,000 or greater.

Assets are depreciated on a straight-line basis over the estimated used life of the property. Information Technology (IT) equipment and software is depreciated over a useful life of three (3) years. All other

equipment is depreciated over a five (5) year useful life. Furniture and fixtures are depreciated over a seven (7) year useful life and leasehold improvements over a ten (10) year useful life.

The Board owns no land and leases its office space from the General Services Administration. The lease costs approximate commercial lease rates for similar properties.

(h) Annual, Sick, and Other Leave

Annual leave is recognized as an expense and a liability as it is earned; the liability is reduced as leave is taken. The accrued leave liability is principally long-term in nature. Sick leave and other types of leave are expensed as leave is taken.

(i) Federal Employee Benefits

The Board recognizes its share of the cost of providing future pension benefits to eligible employees over the period of time that they render service to the Board. The pension expense recognized in the financial statement equals the current service cost for the Board's employees for the account period less the amount contributed by the employees. The U.S. Office of Personnel Management (OPM), the administrator of the plan, supplies the Board with factors to apply in the calculation of the service cost. These factors are derived through actuarial cost methods and assumptions. The excess of the recognized pension expense represents the amount being financed directly by OPM. This amount is considered imputed financing to the Board (see note 8).

The Board recognizes a current-period expense for the future cost of postretirement health benefits and life insurance for its employees while they are still working. The Board accounts for and reports this expense in a manner similar to that used for pensions, with the exception that employees and the Board do not make current contributions to fund these future benefits.

Federal employee benefit costs paid by OPM and imputed to the Board are reported as a resource on the Statement of Changes in Net Position.

(j) Contingencies

The Board has no pending claims or lawsuits against it. Management believes that losses from other claims or lawsuits, not yet known to management, are possible, but would not likely be material to the fair presentation of the Board's financial statements. Thus, there is no provision for such losses in its statements. The Board has not entered into any contractual arrangements which may require future financial obligations.

Note 2 – Funds Balance with the U.S. Treasury

The Board's funds with the U.S. Treasury consist only of appropriated funds. Worksheet adjustments were made for credits of $534 and $75 for FY2007 and FY2006, respectively, for payroll charges that were reflected in the U.S. Treasury cash balance but were not yet recorded in the GSA accounting system. The status of these funds as of September 30, 2007 and 2006 are as follows:

A. Fund Balance with Treasury		2007	2006
Appropriated Fund		$9,149,400	$8,479,577
B. Status of Fund Balance with Treasury			
1) Unobligated Balance		2,975,056	2,754,942
(a) Available		975,836	688,801
(b) Unavailable			
2) Obligated Balance not yet Disbursed		5,198,508	5,035,834
	Total	$9,149,400	$8,479,577

Note 3 – Other Assets

At the end of FY 2007, the Board entered into an Interagency Agreement (IA) with the Public Research Division of the Library of Congress for a research and report project. Per the Library of Congress's enabling authority and the terms of the IA, they billed in advance for the services. This line item represents the Advance.

	2007	2006
1. Intragovernmental	$263,000	$0
2. With the Public – Associates	$ 0	$0
Total Other Assets	$263,000	$0

Note 4 – Accounts Receivable, Net

The line item represents the gross amount of monies owed to the Board. The Board has historically collected receivables due and thus has not established an allowance for uncollectible accounts.

Accounts Receivable	2007	2006
Claims	$74,535	$86,828

Note 5 – General Property, Plant and Equipment, Net

The Board's total cost, accumulated depreciation, and net book value for PPE for the years ending September 30, 2007 and 2006 are as follows.

2007	Equipment	Furniture & Fixtures	Software	Total
Cost	$652,937	$52,644	$355,762	$1,061,343
Accum. Depr.	(561,925)	(46,918)	(81,396)	(690,239)
Net book value	$ 91,012	$ 5,726	$274,366	$ 371,104

2006	Equipment	Furniture & Fixtures	Software	Total
Cost	$646,021	$52,644	$62,778	$761,443
Accum. Depr	(516,918)	(39,284)	(40,265)	(596,468)
Net book value	$129,103	$13,359*	$22,513	$164,975

* rounding

Note 6 – Liabilities Not Covered by Budgetary Resources

The liabilities on the Board's Balance Sheets as of September 30, 2007 and 2006 include liabilities not covered by budgetary resources, which are liabilities for which congressional action is needed before budgetary resources can be provided. Although future appropriations to fund these liabilities are likely and anticipated, it is not certain that appropriations will be enacted to fund these liabilities. The composition of liabilities not covered by budgetary resources as of September 30, 2007 and 2006 is as follows:

	2007	2006
Unfunded Leave	$ 794,541	$ 830,076
Workers' Compensation	$ 8,941	$ 5,376
Total liabilities not covered by budgetary resources	$ 803,482	$ 835,352
Total liabilities covered by budgetary resources	$1,411,470	$1,262,670
Total Liabilities	$2,214,952	$2,098,122

Note 7 - Intragovernmental Liabilities

Intragovernmental liabilities arise from transactions with other Federal entities. $7,142 of the Board's FY 2007 accounts payable is intragovernmental liabilities with the GSA and the balance ($19,154) is with the OPM. Of the FY 2006 accounts payable intragovernmental liabilities, $12,601 were with GSA and the balance ($12,226) were with the Government Printing Office ($5,340), the Department of Energy ($4,100), and the Department of Health and Human Services ($2,786). Employee benefits are the amounts owed to OPM and Treasury as of September 30, 2007 and 2006 for Federal Employees Health Benefits Program (FEHBP), Federal Employees' Group Life Insurance Program (FEGLIP), Federal Insurance Contributions Act (FICA), Federal Employees Retirement System (FERS), and Civil Service Retirement System (CSRS) contributions (reference Note 8).

Note 8 – Federal Employee Benefits

All permanent employees participate in the contributory CSRS or FERS. FERS employees are covered under FICA. To the extent that employees are covered by FICA, the taxes they pay to the program and the benefits they will eventually receive are not recognized by the Board's financial statements. The Board makes contributions to CSRS, FERS and FICA and matches certain employee contributions to the thrift savings component of FERS. All of these payments are recognized as operating expenses.

In addition, all permanent employees are eligible to participate in the contributory FEHBP and FEGLIP and may continue to participate after retirement. The Board makes contributions through the OPM to FEHBP and FEGLIP for active employees to pay for current benefits; these contributions are recognized as operating expenses. The Board does not report on its financial statements these programs' assets, accumulated plan benefits or unfunded liabilities, if any, applicable to its employees. Reporting such amounts is the responsibility of OPM; however, the financing of these costs by OPM and imputed to the Board are reported on the Statement of Changes in Net Position.

Note 9 – Other Liabilities

Other liabilities with the public for the years ending September 30, 2007 and 2006 consist of Accrued Funded Payroll and Leave and Unfunded Leave in the amounts shown below.

	With the Public	Non-Current	Current	Total
2007	Other Liabilities	$794,541	$602,130	$1,396,671
2006	Other Liabilities	$830,076	$533,606	$1,363,682

Note 10 – Workers' Compensation

The Federal Employees' Compensation Act (FECA) provides income and medical cost protection to covered federal civilian employees injured on the job, employees who have incurred a work-related disease, and beneficiaries of employers whose death is attributable to a job-related injury or occupational

disease. Claims incurred for benefits for Board employees under FECA are administered by the Department of Labor and are paid, ultimately, by the Board.

The Board recorded an estimated liability for claims incurred, but not reported as of September 30, 2007 and 2006, as follows:

	2007	2006
Worker's Compensation	$8,941	$5,376

Note 11 – Leases

The Board has not entered into any existing capital leases and thus has incurred no liability resulting from such leases. Its one operating lease is for headquarters office space from GSA. Lease costs for office space for FY 2007 and FY 2006 under the terms of its leases amounted to $2,148,974 and $2,067,960, respectively. The Board entered into a new ten (10) year lease agreement effective March 8, 2006. Estimated future minimum lease payments under the terms of the lease are as follows:

Fiscal Year Ending September 30	Payment
2008	$ 2,148,897
2009	$ 2,173,851
2010	$ 2,252,410
2011	$ 2,285,643
2012	$ 2,319,873
2013 and thereafter	$ 8,194,018
Total Estimated Future Lease Payments	$19,374,692

Note 12 – Intragovernmental Costs

The portion of the Board's program costs (note as the Board earns no revenue from its operations, gross and net costs are identical) related to Intragovernmental Costs and Costs with the Public are shown as follows. Intragovernmental costs are costs incurred from exchange transactions with other federal entities (e.g., building lease payments to GSA). Costs with the Public are incurred from exchanged transactions with non-Federal entities (i.e., all other program costs).

	Intragovernmental Costs	Costs with the Public	Total Program Costs
FY2007	$3,618,015	$17,913,319	$21,531,334
FY2006	$3,200,105	$17,418,474	$20,618,579

The Board's program costs/net costs of operations by OMB Object Class (OC) are as follows:

OC	Description	FY 2007	FY 2006
11	Personnel Compensation	$11,312,375	$10,325,882
12	Personnel Benefits	$ 3,600,670	$ 3,384,373
21	Travel & Transportation of Persons	$ 765,662	$ 700,142
22	Transportation of Things	$ 7,229	$ 90,604

OC	Description	FY 2007	FY 2006
23	Rent, Communications, & Utilities	$ 2,287,898	$ 2,211,417
24	Printing & Reproduction	$ 10,987	$ 33,023
25	Other Contractual Services	$ 3,032,239	$ 3,302,191
26	Supplies & Materials	$ 181,491	$ 197,126
31	Acquisition of Assets	$ 332,783	$ 373,821
	Total	$21,531,334	$20,618,579

Note 13 – Undelivered Orders at the End of the Period

The amount of Unpaid Obligated Balance, Net, End of Period shown on the Statement of Budgetary Resources includes obligations relating to Undelivered Orders (goods and services contracted for but not yet received at the end of the year) and Accounts Payable (amounts owed at the end of the year by the Board for good and services received). The amount of each is as follows:

	Undelivered Orders	Accounts Payable	Unpaid Obl. Balance, Net
FY2007	$3,787,038	$1,411,470	$5,198,508
FY2006	$3,773,163	$1,262,671	$5,035,834

In addition, the Board has $263,000 in prepaid Undelivered Orders relating to the advance payment to the Library of Congress (reference Note 3).

Note 14 – Explanation of Differences between the Statement of Budgetary Resources and the Budget of the United States Government

Budgetary resources made available to the Board include current appropriations, unobligated appropriations and recoveries of prior year obligations. For fiscal year 2006, no material differences exist between the amounts on the Statements of Budgetary Resource and the amounts in the fiscal year 2008 President's Budget. Although there are rounding differences associated with the ending unobligated balance because the President's Budget is rounded to the nearest million. As the President's Budget is not yet available, comparison between the Statement of Budgetary Resources and the actual FY 2007 data in the FY 2009 President's Budget cannot be performed.

Note 15 – Explanation of the Relationship between Liabilities Not Covered by Budgetary Resources on the Balance Sheet and the Change in Components Requiring or Generating Resources in Future Periods

The Change in Components Requiring or Generating Resources in Future Periods equals the difference between the opening and ending balances of Liabilities Not Covered by Budgetary Resources (as shown on the Balance Sheet, reference Note 6), shown as follows:

FY2007

	FY 2006	FY 2007	Change
Unfunded Annual Leave	$830,076	$794,541	($35,535)
Workers Compensation	$ 5,376	$ 8,941	$ 3,565
Total	$835,452	$803,482	($31,970)

FY2006

	FY 2005	FY 2006	Change
Unfunded Annual Leave	$830,320	$830,076	($244)
Workers Compensation	$ 2,213	$5,376	$3,163
Total	$832,533	$835,452	$2,919

Note accrued funded payroll liability is covered by budgetary resources and is included in the net cost of operations, whereas unfunded annual leave liability includes the expense related to the increase in annual leave liability for which the budgetary resources will be provided in a subsequent period.

Note 16 – Reconciliation of Net Cost of Operations (proprietary) to Budget

Budgetary resources obligated are obligations for personnel, goods, services, benefits, etc. made by the Board in order to conduct operations or acquire assets. Other (i.e., non-budgetary) financing resources are also utilized by the Board in its program (proprietary) operations. For example, spending authority from offsetting collections and recoveries are financial resources from the recoveries of prior year obligations (e.g. the completion of a contract where not all the funds were used) and refunds or other collections (i.e., funds used to conduct operations that were previously budgeted). As explained in notes 1(i) and 8, an imputed financing source is recognized for future federal employee benefits costs incurred for Board employees that will be funded by OPM. Changes in budgetary resources obligated for goods, services, and benefits ordered by not yet provided represents the difference between the beginning and ending balances of undelivered orders (i.e., good and services received during the year based on obligations incurred the prior year represent a cost of operations not funded from budgetary resources). Resources that finance the acquisition of assets are budgetary resources used to finance assets and not cost of operations (e.g., increases in accounts receivables or capitalized assets). Financing sources yet to be provided represents financing that will be provided in future periods for future costs that are recognized in determining the net cost of operations for the present period. Finally, components not requiring or generating resources are costs included in the net cost of operations that do not require resources (e.g., depreciation and amortized expenses of assets previously capitalized).

A reconciliation between budgetary resources obligated and net cost of operations (i.e., providing an explanation between budgetary and financial (proprietary) accounting) is as follows (note: in prior years this information was presented as a separate financial statement (the Statement of Financing)):

	FY 2007	FY 2006
Budgetary Resources Obligated	$22,382,741	$20,445,071
Spending Authority from Recoveries and Offsetting Collections	(975,836)	(687,412)
Imputed Financing from Costs Absorbed by Others	627,108	577,006
Changes in Budgetary Resources Obligated for Goods, Services, and Benefits Ordered but Not Yet Provided	(276,874)	364,379
Resources that Finance the Acquisition of Assets	(305,403)	(175,924)
Financing Sources Yet to be Provided (see Note 15)	(31,970)	2,919
Components Not Requiring or Generating Resources	111,568	92,540
Net Cost of Operations	$21,531,334	$20,618,579

APPENDIX A: Actual Performance Results for Prior Fiscal Years

The Board revised its strategic plan in 2003 to refocus its efforts and better align its resources to meet the challenges of ensuring safety in the defense nuclear complex as the complex evolves during the latter half of this decade. Previous performance reports were established and executed to achieve the objectives of the earlier version of the Board's strategic plan. The changes to the plan are evolutionary in nature and primarily result in increased Board attention on ensuring safety in the area of nuclear facility design and infrastructure issues while maintaining vigilance in the areas of nuclear weapons and nuclear materials. The performance objectives from previous years were written to support objectives in only three areas. Rather than being a separate strategic area of concentration, safety oversight of the design and construction of new defense nuclear facilities were captured as part of a broad strategic area of concentration.

Detailed information demonstrating the Board's performance relative to its Strategic Plan and its Annual Performance Plans is available in previous year Performance Reports published on the Board's website at *www.dnfsb.gov*. The tables that follow provide abbreviated summaries and information concerning the Board's actual performance in FY 2006, FY 2005, and FY 2004.

PERFORMANCE GOAL 1—NUCLEAR WEAPON OPERATIONS

Performance Goal 1	Nuclear Weapon Operations. DOE operations that directly support the nuclear stockpile and defense nuclear research are conducted in a manner that ensures adequate protection of the health and safety of the workers and the public.

FY 2006 Performance Accomplishments

Nuclear Explosive Safety Top Down Review. DOE has made significant improvements to the Nuclear Explosive Safety process in the past several years; however, because of continuing problems, the Board and DOE agreed in May 2004 that a Top-Down Review of the process was needed to harmonize the directives, eliminate conflicts and redundancy, determine whether the requirements were adequate, and elevate key requirements to a level in the directives system commensurate with their safety significance. The Board participated in this effort, and DOE briefed the Board on the results in January 2006. Forty-three issues had been developed and considered, and action was recommended on almost half of these. Implementation of some of the recommended corrective actions was initiated promptly; however, others have been on hold pending the completion of a DOE review of production throughput at Pantex.

Revised Nuclear Explosive Safety Directives. In response to the Board's observations, DOE has revised and updated key nuclear explosive safety directives, including DOE Order 452.1C, *Nuclear Explosive and Weapon Surety Program*; DOE Order 452.2C, *Safety of Nuclear Explosive Operations*; and DOE-STD-NA-3016-2006, *Hazard Analysis Reports for Nuclear Explosive Operations*. While the new version of DOE-STD-NA-3016 improves over the previous revision in certain areas, the Board does not consider the requirements contained in the standard to be sufficiently detailed and comprehensive, particularly regarding weapon response development, and is holding the associated commitment in the Recommendation 98-2 Implementation Plan open until issues with the standard are resolved.

Pantex Cell Gap Analysis. The Board evaluated calculations of leakage through cell gaps performed to better understand the consequences of potential accidents at the Pantex Plant. Based on these calculations, leakage through cell gaps does not appear to be an issue for single-unit operations. However, there is still a concern that accident consequences for multi-unit operations involving certain systems in certain facilities could challenge the evaluation guidelines. Additional calculations and testing may be needed to provide assurance that the evaluation guidelines will not be challenged for multi-unit operations.

Electrostatic Discharge (ESD). The Board evaluated efforts by the Pantex Plant contractor and the weapon design agencies to characterize ESD insult environments and the responses of sensitive components to them. Progress has been made in defining the environments and the hazards posed by them; however, the Board has identified the need for additional clarification with respect to furniture (e.g., tooling and equipment) ESD, capacitive coupling between the insulting objects and other nearby charged objects, the assumption of electrical isolation of tools within the established standoff boundary, and resonance conditions and effects.

Special Tooling Program at Pantex. In a letter dated December 15, 2004, the Board expressed concern that continuing weaknesses in the Special Tooling Program could have an adverse impact on the safety of nuclear explosive operations. In response, DOE conducted a comprehensive, independent review of tooling program deficiencies and committed to implement corrective actions to improve the tooling program. The Board reviewed the program in March 2006 and determined that it had significantly improved, thereby improving the safety and efficiency of nuclear explosive operations that rely on specially designed tools to eliminate or minimize hazards.

W56 Dismantlement at Pantex. The Board evaluated process development and execution of the W56 dismantlement campaign at Pantex. The Board urged DOE to ensure that laboratory expertise, both active and retired, was applied to resolve technical challenges that arose to help ensure the safe and successful completion of the dismantlement campaign. Dismantlement of all W56 war reserve units was safely completed in June 2006.

B61 and W87 Operations at Pantex. Recommendation 98-2, *Safety Management at the Pantex Plant*, recommended that DOE expedite development and implementation of re-engineered processes for nuclear explosive operations at Pantex so that the attendant safety improvements could be achieved sooner. In FY 2006, the Board evaluated the start-up of the Seamless Safety for the 21st Century (SS-21) processes for the B61 and W87 Disassembly & Inspection and Rebuild Programs. The enhanced processes utilize upgraded procedures, redesigned tooling, and fewer handling and lifting steps. These improvements make the operations significantly safer and more efficient than their predecessors.

Safety of Dismantlement Operations. The Board continued to evaluate DOE's plans to dismantle an older weapon system not protected by modern safety controls. The Board expressed concern to DOE regarding proposed disassembly activities at non-DOE facilities that did not have adequate safety programs and systems. DOE no longer plans to use such facilities; dismantlement operations are now planned for Pantex facilities.

Conduct of Operations at Pantex. In response to a Board letter issued in May 2005 identifying deficiencies in the conduct of nuclear explosive operations at Pantex, DOE initiated efforts to address the cause of the deficiencies and to develop both near- and long-term plans to improve the conduct of operations. After a follow-up review in FY06, the Board issued a letter to DOE in March 2006 re-emphasizing the importance of a consistently high degree of formality in the conduct of nuclear explosive operations, and favorably noting the extensive involvement of senior contractor management in developing and implementing improvements in conduct of operations at Pantex. As proposed improvements are implemented and the process matures, the Board expects to see continued improvements in the formality of nuclear explosive operations. The Board is continuing to evaluate improvements in the formality of work through daily operational oversight provided by its site representatives.

Pantex Multi-Unit Operations. The Board is evaluating the safety implications of the implementation of multi-unit nuclear explosive operations at Pantex, which are being pursued in support of an increasing operational tempo. In response to the Board's observations, Pantex is taking a more comprehensive approach to evaluating the implementation of multi-unit operations, including analyzing human factors considerations. In addition, the Board has urged Pantex to become more closely involved with studies being performed by the design agencies that will aid in evaluating the increase in risk associated with performing multi-unit operations.

Laboratory Support of Pantex Nuclear Explosive Operations. As a result of concerns over the continued erosion of technical competence and a need to re-emphasize the priority of work that directly supports nuclear safety, the Board issued Recommendation 2002-2, *Weapons Laboratory Support of the Defense Nuclear Complex*. In response, DOE established a single point of contact for each weapon system at each national laboratory, and a requirement at each site office to track and ensure closure of nuclear safety support requirements for weapon laboratories. These changes have enhanced the timely resolution of safety concerns in the nuclear weapon complex. The Board has now closed this recommendation.

Readiness to Dispose of a Damaged Nuclear Weapon. The Board has consistently highlighted to DOE the need to develop the programs and infrastructure at NTS necessary to safely dispose of a damaged nuclear weapon or improvised nuclear device. In FY 2006, the Board determined that DOE no longer had a clear plan for meeting this need. The Board requested that DOE explain the required state of facility readiness and its plans for safety improvements, because it did not appear the mission and hazards had changed. As a result of the Board's interactions, DOE has continued to make physical and procedural improvements at the NTS G-tunnel, provided training, and is reconsidering its plans to be prepared to safely dispose of a damaged nuclear weapon if needed.

Subcritical Experiments. The Board reviewed preparations for subcritical experiments at NTS, identifying inadequate nuclear safety management programs, inadequate mechanisms for verification of readiness, and inadequate safety bases. These items would also be relevant to nuclear weapons testing should such testing be resumed. In FY 2006, DOE made improvements that addressed these issues, including improvements in safety basis reviews, implementation of controls, and readiness reviews. As a result, subcritical experiments have a more complete documented safety analysis and thorough verification of readiness.

Lightning Protection at NTS. In 2003 and 2005, the Board noted deficiencies in lightning protection at NTS related to the protection of nuclear operations and personnel. In response, NTS implemented compensatory measures and began a study of the lightning protection needs at NTS. In FY 2006, a site-wide directive for the lightning protection program and lightning protection studies were completed. As a result, NTS now has a technical basis to identify appropriate controls for lightning protection for hazardous operations and has implemented a site-wide lightning protection program and controls.

Device Assembly Facility at NTS. In FY 2006, the Board evaluated the implementation of the safety basis for the Device Assembly Facility and the conduct of readiness reviews. As a result, DOE is developing plans to assess safety management programs and vital safety systems in DAF, has improved work planning and procedures, and has improved the implementation of controls (such as the fire protection system).

LANL Institutional Corrective Actions. The Board spent considerable effort, including a public meeting on March 22, 2006, reviewing LANL's institutional corrective action programs and ensure their continuity through the contract transition. Corrective actions focus on key areas including safety, quality assurance, software quality management, conduct of engineering, safety basis, conduct of operations, environmental risk management, and training. The Board has also sought to encourage DOE to ensure that adequate resources are provided for implementation of these corrective action plans in a timely manner.

Federal Oversight at LANL. In November 2005, the Board learned of DOE's plan to execute a 3-month "strategic pause" in oversight at LANL to re-engineer oversight policies and procedures in preparation for the transition to a new prime contractor. Approximately two-thirds of the site office's workforce were planned to be devoted to the re-engineering effort during the pause, leaving the remaining third to oversee laboratory operations. The Board objected to the concept of the pause and requested information on how DOE would maintain effective safety oversight for the significant defense nuclear activities pursued during that time period. DOE provided the requested information and proceeded with the pause, which evolved into a pilot project for a new concept in oversight that is heavily reliant upon self-oversight by the contractor. The Board is closely evaluating the development of the pilot project.

Confinement Ventilation at the LANL Plutonium Facility. The current safety basis for the LANL Plutonium Facility credits a passive confinement strategy (i.e., no active confinement ventilation) as a safety-class control to protect the public from postulated accidents. In response to issues raised by the Board, LANL analysts performed a comprehensive set of air-flow calculations to estimate potential releases under accident conditions and concluded that this strategy was inadequate. Compensatory measures were developed and implemented while further study on the confinement strategy was performed. Under the Implementation Plan for the Board's Recommendation 2004-2, *Active Confinement Systems*, this facility is now being assessed as a high priority facility with an accelerated schedule. The Board has continued to review and provide feedback on the draft methodology for leak path factor analysis.

Nuclear Criticality Safety Program at LANL. In October 2005, the Board observed DOE's review of the nuclear criticality safety program at LANL. The DOE review revealed several non-compliances with applicable ANSI/ANS standards and DOE Orders. Among the most serious deficiencies were that some operations had changed without revision to the criticality safety analysis, roles and responsibilities were ill-defined and

implemented, and some fissile operations did not have documented criticality safety analyses. In response, LANL developed a criticality safety improvement plan, which included a thorough assessment of all on-going fissile material operations. The Board evaluated the execution of this improvement plan in late FY06 and found that adequate progress was not being made. This issue is currently being pursued.

Fire Protection at LANL. On May 15, 2006, the Board received DOE's response to issues previously identified by the Board regarding the need to define a multi-year strategy for timely resolution of all fire protection deficiencies and achievement of site-wide improvements at LANL. Issues that needed to be addressed included incomplete documentation and delays in the completion of inspections, tests, and maintenance; fire hazard analyses recommendations not implemented on a timely basis; no formal plan to address the Baseline Needs Assessment for fire and emergency services; no long-term contract for fire and emergency services with Los Alamos County; and fire alarm systems in several defense nuclear facilities still requiring upgrades. The Board reviewed this plan and determined the contractor's proposed activities adequately addressed the Board's concerns; however, questions remain unresolved regarding the ability of DOE's Los Alamos Site Office to fulfill its role in this area.

Incorporation of Safety into the Design of Research and Development at LANL. In November 2005, the Board reviewed LANL's requirements for designing research and development processes and apparatus. The Board reviewed procedures for performing hazard analyses, developing controls, identifying applicable engineering standards and practices, and applying safety-related project management practices, such as having distinct design phases and independent design reviews. Following the transfer of responsibility for management and operation of LANL to a new prime contractor, the approach of the new LANL management was reviewed. LANL stated that its intention that all significant programmatic and facility work at LANL undergo engineering and safety reviews during design and that each major project will have a designated chief engineer who will act as design authority. These initiatives represent a significant improvement compared to past practices at LANL.

Safety Basis at Sandia National Laboratories, New Mexico. In late FY 2005, the Board identified fundamental weaknesses in the implementation of nuclear safety requirements and controls at a defense nuclear facility located at SNL. At present, SNL is pursuing a Safety Basis Improvement Project to resolve the underlying safety-related deficiencies. Most tasks will be complete by the end of 2006, but some actions stretch out to the end of 2008. The SNL corporate-level safety basis group has hired several additional experienced safety basis staff members and augmented this staff with senior contractors who possess complex-wide experience. This has resulted in significant progress, with upgrades in facilities noted during recent reviews by the Board's staff.

Integrated Safety Management at Sandia National Laboratories, New Mexico. In an October 8, 2004 letter, the Board identified multiple failures of the hazard analysis and work control process at SNL. In response, DOE developed a corrective action plan to ensure the associated weaknesses are corrected and that integrated safety management is fully implemented. Near-term corrective actions for defense nuclear facilities are nearing completion, and longer term actions are in progress.

Safety Basis at Y-12. The Board reviewed a draft version of the Documented Safety Analysis for the Building 9212 Complex and identified weaknesses that resulted in improper downgrading of safety systems, including certain fire protection systems. In response to the Board's observations, key fire protection systems were upgraded to safety-class and design adequacy reviews were performed.

Seismic Deficiencies at Y-12. An evaluation by the Board of the Building 9212 Complex found that previously identified seismic deficiencies were not being adequately addressed and that a proposed replacement facility would not be ready to operate until late in the next decade. Based on these findings, the Board encouraged DOE to take steps to implement practical facility modifications in the near term and continue to reduce the quantity of at-risk nuclear material. As a result, DOE commenced evaluations of near-term upgrades and committed to perform a

broad risk prioritization of upgrades needed to support operation of the Building 9212 Complex for the next 15 years.

Uranium Holdup at Y-12. The Board's staff reviewed two criticality safety issues related to uranium holdup in process equipment at Y-12. The first issue involved holdup in an air filter downstream from a uranium chip burner; the second involved holdup in a casting furnace vacuum system filter. Staff input and questions related to nondestructive assay procedures, criticality calculations, and filter cleanout procedures resulted in more rigorous treatment of the issues by DOE and its Y-12 contractor.

Tritium Extraction Facility. The Board continued to perform safety oversight of the Tritium Extraction Facility, which has completed construction and startup testing, and began readiness reviews in late FY06. The facility is now entering the final test phase, in which tritium will be extracted from irradiated tritium producing rods, processed through cleaning operations, and transferred to the another tritium facility at SRS. Safety improvements that were implemented based on Board observations include a seismic alert system, the addition of an oxygen monitor at the lowest elevation in the Remote Handling Building, and improvements to the battery room ventilation system. In addition, reviews of the Worker Protection Safety System suggested by the Board have been completed.

LLNL Plutonium Facility Safety Basis. The Board reviewed the revised Documented Safety Analysis (DSA) for the LLNL Plutonium Facility and determined that it adequately addressed deficiencies identified in the Board's letter of April 12, 2004. The Board was particularly pleased that LLNL has renewed its commitment to a control strategy that includes robust, safety-class active confinement ventilation. The Board identified several isolated weaknesses that warranted consideration in the preparation of future annual updates to the DSA.

Configuration Management at LLNL. In a November 2004 letter, the Board identified the apparent lack of configuration management of vital safety systems at LLNL facilities. During FY 2006, LLNL established procedures and processes to maintain an interim configuration management system. The Board reviewed this interim system and found it to be reasonably adequate to support operations while a more durable, institutionalized program is developed and implemented.

Resumption of Programmatic Operations at LLNL. On October 11, 2005, limited operations in the LLNL Plutonium Facility were authorized to resume using a process for achieving and verifying readiness found generally acceptable by the Board. In April 2006, the Board observed LLNL's readiness assessment to remove the remaining compensatory measures and return to normal operations, and determined that operations could safely resume. On May 23, 2006, DOE authorized LLNL to resume normal operations.

Request for Proposal for the LLNL Management and Operating Contract. The Board evaluated the draft and final Requests for Proposal (RFP) for the LLNL management and operating contract issued by DOE during FY06. The Board determined that DOE had applied lessons learned from the draft LANL RFP, and that there were no ill-advised limitations on DOE's ability to oversee the safety of operations at LLNL.

Nuclear Material Packaging. The Board reviewed two principal deliverables of DOE's implementation plan for Recommendation 2005-1, *Nuclear Material Packaging*: (1) a repackaging prioritization methodology, and (2) nuclear material packaging requirements based on technically justified criteria. The Board found that, although the basic approaches taken were sound, fundamental errors in analyses had substantially obviated the benefits of the contents of both documents. The Board identified these errors in analysis and reasoning in letters dated April 24, 2006, and May 1, 2006. DOE's responses, provided in letters dated June 8, 2006, and July 21, 2006, were not satisfactory to the Board. The Board is working with DOE to ensure that the commitments DOE has made to improve nuclear material packaging for protection of its workers are implemented.

Performance Goal 1	**Nuclear Weapon Operations.** DOE operations that directly support the nuclear stockpile and defense nuclear research are conducted in a manner that ensures adequate protection of the health and safety of the workers and the public.
FY 2005 Performance Accomplishments	

Safety Basis at Pantex. The Implementation Plan for Board Recommendation 98-2, *Safety Management at the Pantex Plant*, includes commitments to re-engineer nuclear explosive processes and implement site-wide technical safety requirement controls for on site transportation. Satisfactory completion of these important commitments continues to be delayed. At the Board's request, senior DOE management is now providing monthly status briefings to the Board, which has focused management attention on completing these commitments, and improving safety at the Pantex Plant.

Nuclear Material Packaging. On March 10, 2005, the Board issued Recommendation 2005-1, *Nuclear Material Packaging*, following a series of reviews regarding the safety of practices for storage of programmatic nuclear materials at DOE defense nuclear facilities. The Board's reviews had found that, although DOE had made progress in the stabilization and safe storage of its excess nuclear materials, the storage requirements for other categories of nuclear materials were not defined and controlled sufficiently to ensure worker protection. The Board recommended that DOE require technically justified criteria for safe storage and handling of nuclear materials, identify which materials should be subject to this requirement, and implement the packaging criteria in a prioritized manner based on the hazards of the different material types and the risk posed by the existing package configurations and conditions. The Secretary of Energy accepted the Recommendation on May 6, 2005, and provided an implementation plan on August 17, 2005, which was accepted by the Board. Implementation will commence in FY 2006.

Special Tooling Program at Pantex. In a letter dated December 15, 2004, the Board identified a number of deficiencies in the Special Tooling Program, which plays a vital role in the safety of nuclear explosive operations at the Pantex Plant. DOE acknowledged that the tooling program had not demonstrated the necessary level of rigor, developed compensatory measures to address deficiencies, and tasked the site contractor to develop and implement a tooling improvement plan. With numerous organizational and process improvements implemented in the tooling program, DOE plans to conduct a follow-on review of the tooling program by the end of FY 2005, with the results becoming available in early FY 2006.

Conduct of Operations at Pantex. Based on a series of events, which indicated that deficiencies existed in the conduct of nuclear explosive operations at Pantex, the Board issued a letter on May 2, 2005, highlighting the deficiencies and querying DOE regarding development of a plan to improve conduct of operations. In response, DOE initiated efforts to address the cause of the deficiencies and to develop both near- and long-term plans to improve the conduct of operations, including training of technicians, improving the fidelity of training equipment, revising roles and responsibilities for supervisors, establishing performance monitoring metrics, and completing a root cause analysis.

Safe Storage of Pits. In response to the Board's Recommendation 99-1, *Safe Storage of Fissionable Material Called "Pits,"* DOE continued to repackage pits into a robust container suitable for interim storage in FY 2005. DOE has now placed a required second type of container in service. Overall, DOE has repackaged its 12,000th pit. The Board has now closed this recommendation.

Lightning Protection at Pantex. In a letter dated November 3, 2004, the Board noted that a number of significant issues related to lightning protection at Pantex remain unresolved. Among these are an investigation into the potential for spalling of interior concrete surfaces as a result of a lightning strike and an evaluation of the impact of added inductance from facility bond wire. The Board also noted slow progress in addressing the potential for an

indirect coupling mechanism from a lightning strike having an impact on nuclear explosive operations. In response, DOE has prepared a project plan, *Investigation of Lightning Initiated Effects at Pantex*, and submitted it to the weapon laboratories for weapon response evaluation.

Laboratory Support of Pantex Nuclear Explosive Operations. The Board reviewed test programs at LLNL and LANL, which involve the response of high explosives to insults, especially with respect to electrostatic discharge and low-velocity mechanical impact. The laboratories have now agreed to a general approach to high explosive material testing, and are approaching agreement on electrostatic discharge testing of weapon components. These tests will provide vital information for the development of effective safety controls for nuclear explosive operations at Pantex.

Readiness to Dispose of a Damaged Nuclear Weapon. The Board has consistently highlighted to DOE the need to develop the programs and infrastructure at NTS necessary to safely dispose of a damaged nuclear weapon or improvised nuclear device. On March 28, 2005, the Board sent a letter requesting that DOE identify the desired conditions of readiness for G-Tunnel, including facility and equipment improvements, and provide its plan and schedule to establish those conditions. A follow-up review by the Board conducted in May 2005 identified further issues regarding lightning protection. DOE is now addressing the lightning protection issues at G-Tunnel, while continuing to make substantial physical and procedural improvements and to provide training to be prepared to safely dispose of a damaged nuclear weapon or improvised nuclear device at NTS should the need arise.

Subcritical Experiments. The Board reviewed DOE's assessments and readiness for subcritical experiments, identifying inadequate nuclear safety management programs; inadequate mechanisms for verification of readiness of subcritical experiments and test readiness (should nuclear weapons testing be resumed); and inadequate safety bases for subcritical experiments and nuclear weapons testing. In FY 2005, DOE's Nevada Site Office improved safety basis reviews, improved the readiness review process, and committed to improve the implementation of controls and the conduct of readiness reviews. As a result, subcritical experiments have a more complete documented safety analysis and thorough verification of readiness.

Electrical Systems and Lightning Protection at NTS. In a letter dated July 1, 2003, the Board noted several safety issues related to electrical and lightning protection systems at NTS. DOE responded on May 14, 2004, and presented a reasonable approach to address many of the issues raised by the Board. In FY 2005, DOE developed a site-wide directive for the lightning protection program and lightning protection studies were completed, but a follow-up review performed by the Board in January 2005 found that a significant number of the actions to which DOE had committed remained unfinished. By March, 2005, DOE had addressed the electrical and lightning protection issues, significantly improving the safety posture across the site.

Device Assembly Facility at NTS. The Board identified deficiencies in safety management programs, implementation of controls, readiness reviews, seismic analysis, and several potential structural issues at the Device Assembly Facility at NTS. In response, DOE narrowed the scope of near-term operations, increased the resources to support the implementation of controls, committed to a readiness review process, and initiated a seismic analysis and structural assessment.

LANL Resumption Activities. Following the suspension of nuclear operations at LANL on July 16, 2004, the Board assessed conditions at the laboratory and reviewed its restart approach. The Board emphasized the need to closely monitor and appropriately adjust plant conditions to maintain a safe and stable configuration during the stand-down. The Board supplemented its full-time site representatives with additional staff to provide real-time feedback to DOE and LANL personnel responsible for resumption activities. The Board has been encouraging DOE to make certain that adequate resources are provided for full implementation of the corrective action plans emerging from the resumption process.

Confinement Ventilation at the LANL Plutonium Facility. The current safety basis for the LANL Plutonium Facility credits a passive confinement strategy (i.e., no active confinement ventilation) as a safety-class control to protect the public from postulated accidents. In response to issues raised by the Board, LANL analysts performed a comprehensive set of air-flow calculations to estimate potential releases under accident conditions and concluded that a passive confinement strategy was inadequate as a safety-class control. DOE is currently preparing a plan and schedule for implementation of an effective safety-class control to protect the public from the consequences of a potential event at the Plutonium Facility.

Full-Scale Aqueous Processing of Plutonium-238 at LANL. In preparation for near-term startup, the Board continued to evaluate the safety of the LANL full-scale aqueous processing line for plutonium-238. The Board observed that LANL had not adequately resolved previously identified issues, such as the flammability hazards posed by the generation of hydrogen gas in process equipment. LANL subsequently committed to strengthen the technical bases and add necessary safety controls.

Conduct of Engineering at LANL. The Board previously noted continued delays in the full implementation of DOE Order 420.1A, *Facility Safety*, which provides design requirements for nuclear facilities, at LANL. The Board also observed that some of the more complex and higher-hazard research, development, demonstration, testing and production work would benefit from a structured application of engineering standards and practices, a formal conceptual design phase similar to that for large facility projects, and design reviews following conceptual and final design. LANL has now incorporated corrective actions to address these issues as part of the Operational Efficiency project that emerged from the suspension of operations at LANL.

Fire Protection at LANL. The Board reviewed the fire protection program at LANL and concluded that while LANL and DOE had increased their attention to fire protection and taken some appropriate actions, resolution of issues had been piecemeal. Issues that needed to be addressed included: incomplete documentation and delays in the completion of inspections, tests, and maintenance; fire hazard analyses recommendations not implemented on a timely basis; no formal plan to address the Baseline Needs Assessment for fire and emergency services; no long-term contract for fire and emergency services with Los Alamos County; and fire alarm systems in several defense nuclear facilities still requiring upgrades. The Board has requested that DOE define a multi-year strategy for timely resolution of all fire protection deficiencies and achievement of site-wide improvements.

Request for Proposal for the LANL Management and Operating Contract. On December 1, 2004, DOE issued a draft Request for Proposal (RFP) for the LANL management and operating contract. The Board's review of the draft RFP found that it placed unnecessary and ill-advised limitations on the DOE's right to inspect and oversee the activities of the contractor, undermined DOE's system for identifying and implementing safety requirements, and omitted relevant safety requirements. The Board issued a letter to DOE on December 16, 2004, identifying these problems. The RFP was subsequently amended to address the issues raised by the Board, significantly strengthening DOE's safety posture at the laboratory.

Safety Basis at Sandia National Laboratories, New Mexico. In late FY 2005, the Board identified fundamental weaknesses in the implementation of nuclear safety requirements and controls at a defense nuclear facility located at Sandia National Laboratories. In response, the Sandia Site Office has reassessed the adequacy of the safety basis for other defense nuclear facilities at Sandia and has rescinded start-up approval for the initial facility in question, where safety basis deficiencies remain, until the documented safety analysis can be revised.

Hazard Analysis Deficiencies at Sandia National Laboratories, New Mexico. In an October 8, 2004 letter, the Board identified multiple failures of the hazard analysis and work control process at Sandia National Laboratories. In response, DOE developed a corrective action plan to ensure the associated weaknesses are corrected and that integrated safety management is fully implemented.

Y-12 Seismic Deficiencies. An evaluation by the Board of the Enriched Uranium Operations building at Y-12 indicated extensive seismic deficiencies. In light of DOE's plan to build a replacement facility by 2013, the Board encouraged DOE to take steps to implement practical facility modifications in the near term and reduce the quantity of at-risk nuclear material. DOE is developing a plan to address this issue.

Y-12 Glovebox Installation. The Board reviewed the new glovebox installation and hazard analysis for the Assembly/Disassembly Building at Y-12. Discussion of the results of the Board's review with DOE and the Y-12 contractor resulted in certain improvements in the equipment design and the procedures.

Y-12 Electrical Safety. As a result of a small electrical fire in the Enriched Uranium Operations Building in 2003, DOE initiated a corrective action plan that included thermal imaging and evaluation of all Y-12 electrical panels. Initial inspections determined that more intrusive inspections were required for some of the panels. The Board noted that these prudent actions were apparently being delayed by other priorities and encouraged DOE to complete them in a timely manner. As a result, DOE applied additional resources and expects to finish by the end of 2005.

Y-12 Authorization Basis Implementation Validation. The Board reviewed Y-12 processes for conducting independent implementation validation reviews for documented safety analysis (DSA) controls developed under 10 CFR 830. The Board noted that Y-12 did not intend to make periodic use of such reviews to ensure controls continued to be properly implemented. In response, Y-12 now intends to require comprehensive independent validation of implementation of DSA controls in each nuclear facility at least every three years.

LLNL 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, particularly the downgrading of the safety-class ventilation system based on questionable calculations. Following an independent analysis of these calculations, DOE reported to the Board in FY 2005 that it had directed the laboratory to maintain the Plutonium Facility's ventilation system as a safety-class system.

Configuration Management at LLNL. In a November 2004 letter, the Board identified the apparent lack of configuration management of vital safety systems at LLNL facilities. 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 LLNL defense nuclear facilities. During FY 2005, DOE completed evaluations of the application of configuration management for the vital safety systems at LLNL defense nuclear facilities, and developed plans to establish the needed configuration management program.

Resumption of Programmatic Operations at LLNL. In January 2005, DOE's Office of Independent Oversight and Performance Assurance (OA) issued a report identifying serious deficiencies in the administrative control programs mandated by the Technical Safety Requirements for the Plutonium Facility (including the configuration management program), as well as deficiencies in the supporting analyses for safety systems. Because of these findings, LLNL suspended programmatic operations in the Plutonium Facility. The Board issued a letter to DOE on March 8, 2005, cautioning DOE against resuming substantial programmatic activity in the Plutonium Facility prior to adequately addressing the findings of the OA report, and requesting a report detailing DOE's path forward for resuming programmatic operations. In July 2005, DOE and LLNL briefed the Board on a generally acceptable path forward toward achieving and verifying readiness to resume a limited scope of programmatic operations. Execution of this plan will continue into FY 2006.

Nuclear Material Packaging and Storage at LLNL. During a November 2004 review at LLNL, the Board identified weaknesses in the packaging and storage of nuclear materials not covered by either Recommendation 94-1, *Improved Schedule for Remediation in the Defense Nuclear Facilities Complex*, or the inactive materials program. Deficiencies in storage criteria and packaging systems indicated that LLNL was not pursuing a

systematic, technically justified approach to packaging. In response, DOE directed the laboratory to evaluate this problem and make improvements to ensure the safe storage of these materials.

Performance Goal 1	Nuclear Weapon Operations. DOE operations that directly support the nuclear stockpile and defense nuclear research are conducted in a manner that ensures adequate protection of the health and safety of the workers and the public.

FY 2004 Performance Accomplishments

Support of the Defense Nuclear Complex. As a result of concerns over the continued erosion of technical competence and a need to reemphasize the priority of work that directly supports nuclear safety, the Board issued Recommendation 2002-2, *Weapons Laboratory Support of the Defense Nuclear Complex.* In FY-04, DOE established at each national laboratory a single point of contact for each weapon system; DOE established at each site office a requirement to track and ensure closure of nuclear safety support requirements for weapon laboratories. These changes have enhanced the timely resolution of safety concerns in the nuclear weapon complex.

Safe Storage of "Pits." In response to the Board's Recommendation 99-1, *Safe Storage of Fissionable Material called "Pits,"* DOE continued to repackage pits into a robust container suitable for interim storage in FY 2004. DOE has repackaged its 10,000th pit. The associated container surveillance program has been rejuvenated and the entire surveillance backlog was worked off during FY 2004.

Improvements in Safety Bases at Pantex. The Implementation Plan for Board Recommendation 98-2 includes a commitment to improve the safety bases at the Pantex Plant. In FY 2004, Pantex completed and approved documented safety analysis for facility and site-wide operations. Pantex has begun implementing a number of new and enhanced controls to improve the safety of nuclear explosive operations.

Readiness to Dispose of a Damaged Nuclear Weapon. The Board has consistently highlighted to DOE, the need to develop the programs and infrastructure at NTS necessary to safely dispose of a damaged nuclear weapon or improvised nuclear device. In FY 2004, DOE made substantial organizational and procedural improvements, and provided training, and developed a safety basis for G-tunnel. As a result, DOE has made substantial physical and procedural improvements and provided training to be prepared to safely dispose of a damaged nuclear weapon should the need arise.

Lightning Protection at LANL. The Board noted that the safety-class lightning protection system at LANL's Weapons Engineering and Tritium Facility (WETF) did not appear to provide adequate lightning protection for the facility. Subsequently, DOE has directed LANL to require that all hazard and accident analysis scenarios be re-evaluated. In addition, LANL is required to upgrade fire barriers and package material-at-risk in approved containers.

Deficiencies in Safety Basis of the Plutonium Facility at LLNL. The Board identified deficiencies in the safety basis for Building 332, the Plutonium Facility, at LLNL. In particular, the Board expressed concern regarding the downgrading of several safety-class systems as part of LLNL's new approach to hazard confinement during accident scenarios. In response, DOE commissioned an independent calculation of the Leak Path Factor and committed to ensuring that system reclassification does not result in downgraded system performance.

Subcritical Experiments. The Board reviewed DOE's assessments and readiness for subcritical experiments, identifying inadequate nuclear safety management programs; inadequate mechanisms for verification of readiness of subcritical experiments and test readiness (should nuclear weapons testing be resumed); and inadequate commitment to improve the readiness review process for subcritical experiments and nuclear weapons testing. In FY 2004, DOE's Nevada Site Office improved the safety basis documents, developed a USQ process, improved the readiness review process, and committed to improve the implementation of controls and the conduct of readiness reviews. As a result, subcritical experiments have a documented safety analysis and there is some verification of readiness.

Lightning Protection at NTS. In 2003, the Board noted that lightning protection at NTS did not appear to provide adequate protection for the nuclear operations and personnel. In response, NTS initiated compensatory measures and a study of the lightning protection needs at NTS. In 2004, lightning protection controls were included in the safety basis of several nuclear facilities. As a result, NTS acknowledged the need to make safety improvements, implemented lightning protection controls, and continues to study lightning protection for NTS.

Hoisting and Rigging at NTS. The Board noted deficiencies in hoisting and rigging, maintenance, and practices for nuclear and nuclear explosive operations at NTS. As a result, DOE has reclassified the critical safety equipment (at G-tunnel) used for the handling of damaged nuclear weapons and improvised nuclear devices as safety-class, improved controls for handling unvented drums of transuranic waste, and improved maintenance of hoisting and lifting equipment. As a result, controls have improved the safety of nuclear and nuclear explosive operations.

Critical Experiments Facility at LANL. The Board raised concerns that the unmitigated consequences predicted for the worst nuclear accidents at TA-18 are significant, but DOE and LANL are relying on the compliance of operators with a set of administrative controls and interim compensatory measures to prevent such accidents. LANL suspended operations at TA-18 after reviewing information provided by the Board and after an LANL review of a safety requirement violation at TA-18 identified weaknesses that reinforced concerns raised by the Board.

Improvements in Quality Assurance related to the Tooling Program at Pantex. In a June 18, 2004-letter, the Board expressed concern that there continue to be serious weaknesses in the program to design and fabricate tools for nuclear explosive operations at Pantex. Additionally, the Board noted that an effective quality assurance program is essential to the safe design, fabrication, procurement, inspection, and maintenance of special tooling. The Board has requested that DOE conduct a comprehensive review of quality assurance as it affects the tooling program at the Pantex Plant. DOE is developing plans to conduct a comprehensive, independent review of quality assurance at the Pantex Plant.

Hoisting and Rigging Operations. During FY 2003 and FY 2004, the Board's staff reviewed the hoisting and rigging programs at the Savannah River Site, the Pantex Plant, the Nevada Test Site, and Sandia National Laboratory. In letters dated July 10, 2003 and January 21, 2004, the Board expressed concerns regarding the maintenance of hoisting equipment, the safety classification of hoisting, vendor communication, and training for emergency scenarios. The Board also provided DOE substantive comments for the revision of DOE standard 1090, "Hoisting and Rigging." The safety of hoisting and rigging operations across the complex has improved, in particular the hoisting and rigging program at the Pantex Plant.

W78 Operations at Pantex. The Board has been urging DOE to improve the safety of weapons-related work at the Pantex Plant since it issued Recommendation 98-2, *Safety Management at the Pantex Plant*. Principle among the Board's recommendations was that DOE simplify and expedite its process for re-engineering nuclear explosive processes at Pantex such that the attendant safety improvements could be put in place sooner. In FY 2004, DOE completed the start-up of the Seamless Safety for the 21st Century (SS-21) W78 Disassembly and Inspection Program. The W78 Disassembly and Inspection program is now significantly safer and more efficient than it had been previously.

Safety of Dismantlement Operations. In a January 20, 2004 letter, the Board identified a number of deficiencies in various processes at the Pantex Plant that led to the attempted dismantlement of a damaged unit in a manner that was not intended, that was not adequately reviewed, and may not have incorporated adequate safety measures. As a result of this incident, Pantex has made improvements in the training of production technicians, in the conduct of unreviewed safety question evaluations, in the performance of nuclear explosive safety evaluations, and in the requirements for involvement of process engineers in certain types of operations.

Y-12 Building 9212 B-1 Wing Fire Protection. The Board identified concerns to DOE Headquarters regarding the adequacy of fire protection in the B- wing of Building 9212 at Y-12. Following a performance-based review, Y-12 recommended upgrades that include installation of sprinklers on the first floor, a new system shutdown interlock and relocation of certain equipment, and the installation of fire-protective coatings on portions of primary extraction column supports, as well as changes (e.g., new catch basin) to divert primary and secondary extraction combustible liquids to the first floor. Design and planning efforts for the modifications/upgrades have been started by BWXT. The full project is planned (and is to be funded) to be completed by late Fiscal Year 05. When completed, it will improve the degree of fire protection in the facility to a level appropriate for the remaining life of the facility.

Y-12 Oxide Conversion Facility. The Board identified concerns in a December 2003 letter regarding the startup of the Oxide Conversion Facility (formerly referred to as the Hydrogen-Fluoride facility). These concerns included missing weld radiographs, lack of proper designation of certain safety equipment, a credible criticality scenario not addressed, and worker safety concerns. DOE re-radiographed significant welds, upgraded the functional classification of safety system equipment, added seismic reinforcement to address the criticality concern and addressed the worker safety concerns.

Y-12 Conduct of Operations. The Board raised concerns over the formality of operations at Y-12 and the adequacy with which management oversight was exercised. An overall improvement initiative was started by Y-12 that includes a management observation program to provide increased and documented on-the-floor observations of nuclear operations. Y-12 also instituted a "Conduct of Operations Representatives" program to provide ongoing, independent oversight and mentoring during nuclear operations. Six of these representatives have now been deployed.

Y-12 Independent Validation of Safety Basis Controls. The Board inquired on lack of a Y-12 process for independent validation of implementation of new or revised safety basis controls. Y-12 has instituted independent validation protocols for new/revised safety basis controls. Initial implementation validation reviews in certain Y-12 nuclear facilities showed the need for several enhancements to line management implementation efforts and personnel training. Corrective actions are ongoing.

Y-12 Activity Level Work Planning for Infrequent, Potentially Hazardous Operations. The Board identified planning weaknesses that led to inadequate definition of safety controls for infrequent, potentially hazardous operations. DOE prompted a contractor assessment resulting in higher levels of review and approval for such evolutions. A successful trial application is being expanded for use by all major nuclear facilities at Y-12.

Y-12 Conduct of Engineering Improvements. After operations failures related to engineering changes at Y-12, the Board raised concerns regarding the adequacy of engineering analysis used to support the changes. Y-12 evaluated its engineering processes and took steps to strengthen requirements on proper design input and verification for engineering changes and to conduct improved training for Y-12 engineering personnel on these issues.

GOAL 2—NUCLEAR MATERIAL PROCESSING AND STABILIZATION

Performance Goal 2	Nuclear Material Processing and Stabilization. The processing, stabilization, and disposition of DOE defense nuclear materials and facilities are performed in a manner that ensures adequate protection of the health and safety of the workers and the public.
FY 2006 Performance Accomplishments	

Hanford Sludge Retrieval and Disposition Project. The Board noted that the fabrication of sludge transfer equipment was not in accordance with the documented safety analysis (DSA) assumptions for the equipment and also noted the lack of a systematic engineering approach to verify the DSA assumptions. The project corrected the discrepancy and initiated a tracking mechanism for future design efforts. The Board also identified a problem with the integration of safety into the design for the sludge treatment project. DOE investigated the extent of the condition and suspended the procurement authorization pending DOE approval of the preliminary DSA.

High Level Waste (HLW) Tank Integrity—Vapor Space Corrosion. In response to a Board letter regarding corrosion in the vapor space of HLW tanks, DOE sponsored an expert panel at Hanford July 10-12, 2006, to evaluate the mechanisms of this type of corrosion. The expert panel identified several mechanisms by which corrosive species could concentrate on tank walls and plans to propose a series of laboratory experiments to evaluate these mechanisms. This should allow DOE to identify additional measures to protect the integrity of HLW tanks.

Tank AN-107 Chemistry Control at Hanford. The DSA for Hanford's HLW tanks requires the liquid waste to have a minimum pH of 13 to prevent corrosion. However, the liquid in the sludge of Tank AN-107 was at pH 11 and decreasing to pH 10. The Board questioned DOE's approval of a waiver to accept this lower pH without adequate technical justification. DOE responded by establishing a test program to determine optimum waste chemistry limits for maintaining tank integrity. The first phase of this program studied the effect of pH on corrosion. The results showed the pH could as be as low as 10 without significantly increasing the corrosion rate. To confirm the laboratory results, DOE plans to install a corrosion probe in tank AN-107 to continuously monitor corrosion.

Decommissioning Activities at Hanford's Plutonium Finishing Plant (PFP). Because of delays in DOE's ability to consolidate nuclear materials, decommissioning activities at PFP have slowed, and the date for completing decommissioning has been extended from 2009 to 2016. The Board continues to evaluate the transition of PFP from a near-term decommissioning mission to an extended lay up period. Through a number of walk downs of the PFP facilities, the Board identified deficient areas (e.g., structure and fire protection piping deterioration) that will require additional attention from DOE if the safety systems and features are to remain operational during the extended lay up period.

Soil Remediation at Hanford. The Board reviewed the safety basis and work planning for the 118-K Burial Ground remediation activity to determine if nuclear criticality concerns had been adequately addressed and if the DSA was compliant with guidance from DOE. The initial version of the DSA contained numerous criticality controls that did not comply with DOE criteria. The Board provided feedback to DOE, resulting in a revision to the DSA such that the DOE criteria were met and unnecessary criticality safety controls were removed.

Hanford Site Conduct of Operations. The Board routinely observed operations at the Hanford Site's Tank Farms, the K Basin Closure Project, and the Plutonium Finishing Plant and commented on deficiencies in conduct of operations. In response, DOE implemented improvement plans for conduct of operations. The Board has recently noted improvements in the safety of these operations.

Waste Drums Containing Plutonium-238 at Hanford. Since 2002, the Board has noted the potential hazards associated with the retrieval, handling, and disposition of 12 drums containing plutonium oxides with high plutonium-238 content. The drums were located in a burial ground at the Hanford Site. In October 2005, DOE safely retrieved the 12 drums and placed them in interim safe storage.

Transuranic (TRU) Waste Drum Handling at Hanford. The Board reviewed hydrogen controls for vented TRU waste drums at Hanford and found the controls to be non-conservative. DOE was using a control level of 15% hydrogen, while the safe and commonly accepted control level is 4% (the lower flammability limit for hydrogen). After this concern was communicated, DOE reduced the control level for hydrogen concentration in vented drums. This represented a significant improvement in safety margin for these operations.

Safe Storage of Neptunium Oxides at Idaho National Laboratory (INL). Operators at the Material and Fuels Complex at the INL have received and stored neptunium oxide materials shipped from SRS. The Board reviewed the neptunium storage plans and provided feedback to DOE regarding the adequacy of the storage plans. As a result, DOE is working to develop a new surveillance and maintenance plan for this activity.

Decommissioning at the Fernald Closure Project. The Board reviewed and provided comments to DOE on the safety of final decommissioning and closure work at the site. In response, DOE made changes to improve safety during the demolition of the Silos waste treatment facilities and during placement of contaminated soil and debris in the On-Site Disposal Cells. DOE completed all site closure work in FY 2006.

Tank 48 Disposition at SRS. In response to Board Recommendation 2001-1, DOE submitted a letter report assessing alternatives for treatment of organic compounds and HLW contained in Tank 48. Also, in response to Board concerns, DOE made a new commitment in the Implementation Plan for Recommendation 2001-1 to return Tank 48 to waste processing service by 2010, utilizing organic destruction in a newly designed treatment facility.

Trapped Hydrogen in Process Systems. Based on information from the Waste Treatment Plant at Hanford, the SRS contractor identified all components (e.g., piping) in the Defense Waste Processing Facility (DWPF) that could be capable of trapping hydrogen, which could lead to pressure loads during an explosion. In response to Board observations, additional validation of the hydrogen explosion model was performed to ensure it could generate accurate predictions for DWPF piping configurations. Furthermore, to address Board concerns regarding hydrogen buildup in failed tank cooling coils, the contractor formed a team to incorporate consideration of this hazard into the work planning process, and issued a report listing equipment of concern, along with corresponding recommended controls.

Startup Readiness Reviews at SRS. The Board observed the readiness review performed by the contractor for the retrieval of waste from an older-style HLW tank, using a new mixer pump and equipment, and found that the rigor and scope of the readiness review was inadequate. In response, DOE required the contractor to perform additional reviews to demonstrate readiness to begin waste retrieval operations. Furthermore, the procedure for performing readiness assessments was significantly revised to incorporate lessons learned and good practices. Observations from the Board's extensive oversight of readiness reviews during the year resulted in a number of weaknesses being corrected and subsequently, a noticeable improvement in the planning, conduct, and thoroughness of contractor readiness reviews.

DOE Technical Oversight at SRS. On March 3, 2006, the Board issued a letter informing the DOE Savannah River Operations Office (DOE-SR) that it was not aggressively pursuing the new oversight requirements contained in DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*, and that DOE-SR must fill a substantial gap if it is to fully implement the new oversight directives by the required date. Included in the letter was a 90-day reporting requirement to the Secretary of Energy requesting implementation plans for DOE Order

226.1 across the defense nuclear complex. The Board is continuing to provide extensive oversight of site office corrective actions to ensure they have the desired effect.

Conduct of Operations at SRS. The Board pointed out several deficiencies in the conduct of nuclear operations at SRS. These observations resulted in further DOE and contractor reviews of radiological protection, increased senior management watches, the addition of safety prerequisites to procedures, the performance of mockups, and improved critiques. Formal conduct of operations is now improving, leading to safer nuclear operations.

TRU Waste Drum Retrieval and Characterization. During visits to several DOE sites, the Board noted inconsistent, and in some cases unsafe, approaches from site to site during the retrieval, characterization, and handling of unvented and newly vented TRU waste drums. In response, DOE's TRU Waste Corporate Board is addressing the need for a consistent approach for dealing with unvented TRU drums, the hydrogen gas hazard, and other hazards associated with handling TRU waste. DOE's effort is expected to culminate in the issuance of a new DOE Standard for TRU waste handling activities.

Soil Sampling at Tank W-1A, Oak Ridge National Laboratory. The Board pointed out deficiencies in work planning for the sampling and characterization of soils near Tank W-1A at the Oak Ridge National Laboratory. Areas of weakness included hazard analyses, work instructions, and preparation of radiation work permits. In response, DOE revisited and completed thorough radiological work planning efforts that culminated in a safe and efficient sampling and characterization effort.

Performance Goal 2	**Nuclear Material Processing and Stabilization.** The processing, stabilization, and disposition of DOE defense nuclear materials and facilities are performed in a manner that ensures adequate protection of the health and safety of the workers and the public.

FY 2005 Accomplishments

Nuclear Material Stabilization and Storage at LANL. The Board increased its oversight of the efforts of DOE and the contractor at LANL to establish adequate systems, safety bases, and procedures for the stabilization of plutonium scrap materials. The efforts at LANL continue to lag far behind the commitments made by the Secretary of Energy. The Board continued to ensure that DOE addressed safety issues communicated to DOE in previous years.

Surveillance and Monitoring Program for Plutonium Storage. The Board continued to monitor activities within DOE to comply with DOE-STD-3013, *Stabilization, Packaging, and Storage of Plutonium-Bearing Materials*, which establishes requirements for the long-term storage of plutonium metal and oxides and requires a surveillance and monitoring program to verify safe storage parameters. Through the Materials Identification and Surveillance Program, the Board provided feedback on the scientific and statistical methodology being employed for surveillance of plutonium in storage.

High-Level Waste Tank Integrity. The Board closely followed the HLW tank integrity program for double-shell tanks at Hanford. The Board issued a letter to DOE questioning DOE's approval of a plan to exempt a tank from waste chemistry limits established in the technical safety requirements, and requested a report on the long term management of tank space while maintaining waste chemistry within TSR limits. DOE responded to the Board's request and sponsored laboratory corrosion studies to establish optimum waste chemistry limits for maintaining tank integrity. In a letter to DOE, the Board noted that laboratory studies for vapor space corrosion within the tanks were not included. DOE is assessing the feasibility of including vapor space corrosion studies in the program.

Hanford Tank Farms Integrated Safety Management. 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 unexpected conditions. The Board issued a letter 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. Hanford's tank farms contractor identified and implemented corrective actions, and DOE conducted a two-part improvement validation review at the tank farms in November 2004 and March 2005.

Tank 48 Disposition. The Board reviewed the safety of DOE's proposed disposition of HLW from Tank 48 at SRS, which poses a potential explosion hazard due to the generation of flammable vapors. The Board found that DOE did not have enough validated experimental data to show that an explosion would not occur during processing or disposal. DOE committed to perform additional analyses and experiments with better analytical techniques and equipment to ensure the safety of this operation.

Hydrogen Release from HLW. The contractor at SRS developed a hydrogen retention model for HLW tanks that led to a program for periodic agitation of the waste in certain HLW tanks to prevent a large hydrogen release. The Board questioned the conservatism of the model; subsequently, an actual hydrogen release event showed that the model was non-conservative. As a result, the contractor developed and implemented a conservative hydrogen retention model and agitation program that reduces the possibility of a fire or explosion due to the release of hydrogen.

Safety System Upgrades at SRS. As a result of safety issues raised by the Board, the contractor at SRS made safety equipment upgrades on HLW Tanks 3, 11, and 41 at SRS. The upgrades included the installation of ventilation interlocks, lower flammability limit interlocks, and devices to prevent inadvertent addition of liquid to the tanks.

Transfer Control Program at SRS. In the last year, several inadvertent transfers of HLW occurred at the tank farms at SRS. The Board reviewed the transfer control program and suggested improvements to reduce the possibility of transfer errors. The contractor revised the transfer control program and incorporated the Board's suggested improvements.

Hanford Spent Nuclear Fuel Project. The Board's review of ongoing spent nuclear fuel project operations at Hanford identified that changing conditions were not being appropriately reviewed by the contractor for safety implications. Reevaluation of these activities led the implementation of new controls to provide adequate safety for fuel removal operations. The contractor completed spent nuclear fuel removal with the exception of a limited number of fuel pieces that will be removed during sludge retrieval efforts. The removal of spent nuclear fuel from the K Basins represents a significant reduction in risk at the Hanford Site.

Hanford Sludge Retrieval and Disposition Project. The Board continued to provide oversight of the contractor's efforts to retrieve of sludge from the K-East Basin at Hanford and to design the sludge transfer system. Safety issues identified by the Board led the contractor to make design changes and DOE to commission a Sludge Review Board to provide additional oversight. The Board urged DOE and the contractor to reevaluate the effectiveness of corrective actions identified in response to past deficiencies. After delays and difficulties with sludge retrieval operations, the project began to make some progress toward the goals of completing sludge retrieval and preparing for sludge treatment.

Decommissioning of Building 371 at the Rocky Flats Environmental and Technology Site (RFETS). The Board completed its safety oversight responsibilities with the dismantlement of Building 371, which was the last plutonium building at RFETS. The RFETS closure project is near completion with only industrial hazards remaining. The Board conducted several meetings with both DOE and the contractor and visited the site, reinforcing the importance of worker safety. The Colorado Department of Public Health and Environment now has responsibility for oversight of DOE's program for monitoring and surveillance of legacy materials.

Hanford Site Decommissioning Activities. The Board reviewed decommissioning activities at the Plutonium Finishing Plant (PFP) and identified safety issues regarding the criticality safety and fire protection programs. The Board sent letters to DOE on these subjects, and the contractor developed corrective actions to resolve the issues. Although the contractor made some improvements, PFP managers noted additional difficulties. Subsequently, the Board met with representatives of DOE and contractor to discuss ongoing corrective actions to improve worker safety.

Deactivation Activities at the Savannah River Site (SRS). The Board reviewed deactivation and decommissioning activities at SRS and concluded that the program is reasonably well run. The program is ahead of the target schedule to demolish 239 buildings before the end of the current contract, September 30, 2006. The Board has emphasized criticality safety and fire protection, and has sent a letter to DOE requesting increased effort on hazard analysis and worker protection.

Decommissioning at the Miamisburg Closure Project. The Board closely followed the decommissioning work at Miamisburg, stressing worker safety, which has been good at the site. Site closure work is expected to be complete by December 2005—this includes demolition of 66 buildings and transfer of 9 buildings to the Miamisburg Mound Community Improvement Corporation for commercial use.

Decommissioning at the Fernald Closure Project. The Board reviewed safety documentation and readiness preparations for the Silo 1, 2, and 3 projects at Fernald, which are designed to retrieve and package uranium-bearing wastes for shipment and disposal offsite. The Board and the site readiness review teams found several deficiencies in the Silos 1 and 2 projects and determined that corrective actions were needed before radioactive operations could begin. The Board sent a letter to DOE stating that improvements were needed in the management self-assessment process used by the contractor to verify that the project was ready to begin operations. As a result, project managers corrected the self-assessment process, successfully completed a startup readiness review, and safely began waste processing operations.

Deactivation of the Heavy Element Facility at the Lawrence Livermore National Laboratory. Laboratory operators removed sufficient inventory of radioactive material from the Heavy Element Facility to allow it to be downgraded to a Radiological Facility. Facility operators then began decontamination and disposal of gloveboxes. The Board provided oversight of these activities and ensured that lessons learned from decommissioning activities at other DOE sites were incorporated into the deactivation and decommissioning work.

Melton Valley TRU/Alpha Low-Level Waste Treatment Facility. Prior to startup of this new facility, the Board pointed out deficiencies in the conduct of operations for radiological work. In response, the contractor upgraded the safety of non-routine radiological work by requiring verbatim compliance with procedures.

Retrieval of TRU Waste Drums at Hanford. The Board reviewed DOE plans to retrieve TRU waste drums from soil-covered trenches and noted a lack of adequate controls to protect the workers. In response to a letter from the Board, DOE and its contractor implemented more robust controls for handling unvented drums and began planning for the safe retrieval and handling of high-source term drums containing plutonium-238.

Performance Goal 2	Nuclear Material Processing and Stabilization. The processing, stabilization, and disposition of DOE defense nuclear materials and facilities are performed in a manner that ensures adequate protection of the health and safety of the workers and the public.

FY 2004 Accomplishments

Nuclear Material Stabilization and Storage at LANL. As part of the implementation of the Board's Recommendations 94-1 and 2000-1, the Board has continued to evaluate NNSA's plans for repackaging high-risk materials at LANL into robust containers, and to urge NNSA to pursue alternative approaches that could accelerate this work. As a result, LANL and NNSA have developed a comprehensive nuclear materials packaging and storage plan that will result in a substantial reduction in risk by accelerating the schedule for stabilization, packaging, and improved storage of nuclear materials.

Inactive Actinide Materials. The Board evaluated NNSA's plans for managing non-programmatic actinide materials stored at LANL, LLNL, SNL, Pantex Plant, and Y-12. The Board found that NNSA has begun to define and execute adequately its 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-STD-3013, *Stabilization, Packaging, and Storage of Plutonium-Bearing Materials*, which establishes requirements governing the long-term storage of plutonium metal and oxides, requires a surveillance and monitoring program to verify safe storage parameters. The Surveillance and Monitoring Program managed by the DOE Savannah River Operations Office was established for this purpose, but despite assurances provided last year, DOE again under funded the LANL portion of this effort, thereby jeopardizing verification of safe storage parameters as required by the standard. 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.

Hanford Tank Farms Fill Height. The Board questioned the safety of DOE's plan to fill certain high-level waste tanks beyond the height which was tested for leaks during construction. In response to these questions, DOE limited the proposal to only those tanks which had been leak tested to the proposed fill height.

Safety Basis for Hanford Tank Farms. The Board identified that the revised Technical Safety Requirements for flammable gas and waste transfers had eliminated key safety controls and that the site's independent validation of the implementation of the Documented Safety Analysis was inadequate. Continued questions by the Board led to the further discovery that the contractor had inadvertently put a tank at risk of retaining and releasing significant quantities of flammable gas. As a result, DOE rewrote the Technical Safety Requirements to reinstate necessary controls, convened a second independent review to ensure all controls had been implemented, and increased the frequency of key tank waste measurements to better ensure that current waste conditions remained safe.

Salt Waste Processing Facility at SRS. 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 the Critical Decision (CD)-1 facility design documentation and identified weaknesses in the performance categorization and potential seismic interactions of various portions of the facility. DOE plans to perform further analysis and upgrades to the facility's structural components to address the Board's concerns.

Mercury Hazards at the SRS High-Level Waste System. In 2002, the site identified the potential for workers to be exposed to mercury vapors and compounds in the high level waste tank farms. Since the initial discovery, the Board has had held discussions with DOE and the contractor regarding actions to protect site workers and verified the adequacy of the engineered and administrative controls implemented to protect workers from mercury exposure.

Hanford High-Level Waste Tank Integrity. The Board reviewed the tank inspection program at Hanford and proposals to relax requirements for corrosion inhibitors in the tank waste. The Board provided input during meetings of a Corrosion Expert Panel held at Hanford to evaluate the proposed changes. The panel recommended maintaining the existing corrosion inhibitor controls until a solid technical basis can be developed.

Hanford Spent Nuclear Fuel Project. The Board's review of ongoing spent nuclear fuel project operations at Hanford identified that changing conditions were not being appropriately reviewed by the contractor for safety implications. Reevaluation of these activities led to multiple positive unreviewed safety questions and the implementation of new controls to provide adequate safety for fuel removal operations.

Hanford Sludge Retrieval and Disposition Project. The Board continued to provide close oversight of the contractor's efforts to start the retrieval of sludge from the K-East Basin at Hanford. The Board urged DOE to require a formal Operational Readiness Review (ORR) for sludge retrieval and to identify new milestones for completing sludge retrieval. DOE and its contractor both completed ORRs that were rigorous and the contractor began limited sludge retrieval. Additionally, DOE committed to new milestones for sludge retrieval and treatment.

Melton Valley Transuranic/Alpha Low-Level Waste Treatment Facility. Prior to startup of this new facility, the Board pointed out deficiencies in the conduct of operations for radiological work. In response, the contractor upgraded the safety of non-routine radiological work by requiring verbatim compliance with procedures.

Safety Basis for 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 concerning quantities of material at risk, analysis of deflagrations, and in the controls specified in the Technical Safety Requirements. Following several discussions and a Board letter, DOE agreed to add several new controls including a formal container inspection program and lid restraints for unvented drums, and will require an Operational Readiness Review for new deployments to ensure sites receiving the units are ready to operate them safely.

Retrieval of Transuranic Waste Drums at Hanford. The Board reviewed DOE plans to retrieve transuranic waste drums from soil-covered trenches and noted a lack of adequate controls to protect the workers. In response to a letter from the Board, DOE and its contractor implemented more robust controls for handling unvented drums and began planning for the safe retrieval and handling of high-source term drums containing plutonium-238.

Rocky Flats Environmental Technology Site Building 371 Fire. The Board completed its evaluation of the significant fire that occurred on May 6, 2003, during decommissioning of a glovebox. In a letter of December 2, 2003, the Board identified broad weaknesses in the planning and execution of decommissioning work at RFETS, as well as the site's failure to properly investigate the fire or address the problems which led to the fire. In response, DOE and the contractor conducted extensive reviews and implemented corrective actions such as restricting the use of generic work packages to only simple tasks, instituting more comprehensive review of work packages, improving chemical decontamination and combustible control procedures with associated improvements in conduct of operations, retraining workers on the proper response to fires, and improving daily pre-evolution briefings to better communicate hazards and controls to the workers. Lessons learned have been shared with other DOE sites performing decommissioning work.

Fernald Silo 3 Waste Disposition Project. The Board reviewed the safety analysis for the Silo 3 waste disposition project and raised questions regarding the proper classification of the project, the new form of safety documentation (a nuclear health and safety plan), and various assumptions used in the safety analysis. The contractor subsequently made changes in the safety documentation to improve worker safety. The Board also provided comments on ways to improve the readiness review plans for the startup of the Silo 3 project that were accepted by the contractor and DOE.

Decommissioning at SRS. The Board evaluated the safety of decommissioning activities at SRS and expressed concern to DOE regarding several potentially serious events, including a release of tritium from contaminated piping, exposure of workers to an unshielded cesium-137 source, falling pipes and duct work, cutting into active electric lines, a grass fire, and several other events. Although the contractor implemented corrective actions after each event, the Board is evaluating the broader issues regarding the adequacy of training, procedures, and supervision for decommissioning work at SRS.

Sodium Fluoride Traps at ORNL. In a September 2002 Board letter regarding storage of sodium fluoride traps containing uranium-233 hexafluoride in Building 3019, the Board noted the safety issues due to increasing pressure in the traps from radiolytic gas production. ORNL now has completed the depressurization of all sodium fluoride traps susceptible to high pressures.

GOAL 3—NUCLEAR FACILITIES DESIGN AND INFRASTRUCTURE

Performance Goal 3	**Nuclear Facilities Design and Infrastructure.** New DOE defense nuclear facilities, and modifications to existing facilities, are designed and constructed in a manner that ensures adequate protection of the health and safety of the workers and the public.
FY 2006 Performance Accomplishments	

The Board and its staff continued providing technical evaluations of numerous design and construction projects through out the DOE complex. These evaluations have led to DOE improving its design process, enhancing the design of new facilities, correcting construction deficiencies noted, as well as starting actions to correct identified issues. Some of these actions are:

Safety-in-Design Public Meetings. As a result of reviews conducted by the Board during the past several years, it became apparent to the Board that safety was not being integrated into the design of new facilities early in the design process. The Board held two public meetings to delve into how safety could be better integrated into the DOE design process. As a result, DOE acknowledged that improvements were needed to better incorporate safety into the design of nuclear facilities and reported undertaking a number of initiatives to address the identified shortcomings. DOE has now established new expectations for identifying and resolving safety issues earlier in the design process, revised the existing DOE Order for project management, and is working to revise the existing DOE Manual for project management. Further, DOE is developing a new standard to implement a more rigorous approach to safety-in-design. The Board expects that these actions, when fully implemented, should lead to significant improvements in the design of new defense nuclear facilities.

Waste Treatment Plant at the Hanford Site. The Board has continued its review of the design and construction of important-to-safety structures, systems, and components in the Waste Treatment Plant facilities. The design and construction of these facilities slowed significantly during this past year while DOE addressed budget issues. The Board's activities primarily consisted of considering the resolution of previously identified issues. Subsequent deficiencies and concerns have been identified during these reviews, for example:

- The Board had earlier identified that the DOE-specified seismic requirements may not have been sufficiently conservative. DOE evaluation of this concern identified that the seismic requirements were underestimated by about 40 percent. DOE is now evaluating the impact this increase will have on the design of the structure and equipment and using state-of-the-art techniques to develop new data to resolve some uncertainty in the modeling used to predict the seismic hazard. The Board is evaluating the techniques being used to collect these data.

- DOE significantly underestimated the impact of hydrogen hazards on pipes and small process vessels and components. At the urging of the Board, DOE has continued to evaluate design solutions to address the issue and re-evaluated and issued new design criteria to ensure the design remains fully protective of the public's health and safety.

- The Board continues to follow the status of the design and installation of fire-protective coating on structural steel subsequent to DOE directing the contractor to comply with code requirements. Questions on the basis for not coating some steel have resulted in DOE developing criteria and a methodology to justify the decisions. The Board has questioned the basis for much of the criteria in an attempt to improve its technical adequacy.

Demonstration Bulk Vitrification Facility at the Hanford Site. In September 2005, the Board identified potential weaknesses in areas such as the design, safety analysis, and the safety of workers that needed to be considered in finalizing the design of the Demonstration Bulk Vitrification Facility. Design of the facility continued in FY 2006 including an independent expert review arranged by DOE. Additionally, a more formal approach to project management was implemented. As a result, the design has continued to evolve and improvements in radioactive material confinement and worker safety features have been developed.

Integrated Waste Treatment Unit at the Idaho National Laboratory. The Board reviewed major aspects of the project organization, preliminary design, and safety basis development for the Integrated Waste Treatment Unit (IWTU). Primary areas of focus included: process design and confinement strategy, safety strategy as detailed in the preliminary documented safety analysis, and pilot plant testing. In response to Board concerns, the DOE directed the project to use a more conservative and commonly used computer code for estimating radiological consequences for co-located workers and the public from postulated accidents. Further, the project directed a review of key safety analysis inputs and subsequently changed its inputs for many of the postulated accidents. The Board is continuing to review concerns including: control strategy for hydrogen deflagration prevention in process equipment, rapid shutdown system design, and waste characterization/radionuclide inventory controls.

Los Alamos National Laboratory Chemistry and Metallurgy Research Replacement Facility. The Board performed a series of reviews on the conceptual design and initial portions of the preliminary design. A number of significant concerns were identified, including an inadequate suite of safety controls that would not provide confinement under all accident scenarios. NNSA is currently working to address the concerns raised by the Board.

Device Assembly Facility at the Nevada Test Site. The Board noted to DOE deficiencies in the seismic analysis and potential structural issues associated with extensive cracking and water leaks in the Device Assembly Facility (DAF) at the Nevada Test Site. The criticality testing capability from TA-18 at Los Alamos National Laboratory is being relocated to the Criticality Experiments Facility, which will be housed in DAF. The Board had previously reviewed the plans for the Criticality Experiments Facility (including design reviews and preliminary documented safety analysis) and took issue with the lack of design criteria and an inadequate safety analysis. In FY 2006, the Board provided additional feedback to DOE regarding the progress on the safety analysis, ongoing seismic analysis, and evaluation of the cracking concerns. As a result, DOE now plans to perform a new structural and seismic analysis, has plans to address water leaks, and is preparing a new safety analysis. The Board informed DOE that further testing of the concrete strength was prudent to fully evaluate the impact of the extensive cracking in DAF.

Pit Disassembly and Conversion Facility at the Savannah River Site. The Board continued to review the safety of the design of the Pit Disassembly and Conversion Facility (PDCF). The Board reviewed the surface settlement profiles at the building foundation as a result of soft zones unique to the Savannah River Site (SRS). Based on this review, the Board found that although the final predicted surface settlement is deemed adequate, the methods used need to be improved. The Board will address this concern with SRS separately. The Board also suggested several improvements in the electrical design of PDCF. The Board observed that the design rating of the diesel generator may not be adequate to handle the necessary loads during startup following a loss of offsite power.

Salt Waste Processing Facility at the Savannah River Site. The Board's review of the conceptual design of the Salt Waste Processing Facility at SRS identified weaknesses in the facility's design criteria for natural phenomena hazards. As a result, DOE has now directed its contractor to pursue a more robust structure, which will provide the confinement required by the DOE safety basis. The Board continues to review the new enhanced design as well as site geotechnical investigations.

Highly Enriched Uranium Manufacturing Facility. The Board initiated its review of construction activities for the Highly Enriched Uranium Materials Facility (HEUMF) at the Y-12 National Security Complex. The initial assessment focused on implementation of the construction quality program for reinforced concrete installation.

Several fundamental concerns were noted and discussed with DOE. However, shortly after DOE initiated corrective actions, a significant number of quality related deficiencies became evident. Short term compensatory actions were initiated on the project while long-term corrective actions are being developed and implemented.

Performance Goal 3	**Nuclear Facilities Design and Infrastructure.** New DOE defense nuclear facilities, and modifications to existing facilities, are designed and constructed in a manner that ensures adequate protection of the health and safety of the workers and the public.

FY 2005 Performance Accomplishments

The Board and its staff continued providing technical evaluations of numerous design and construction projects through out the DOE complex. These evaluations have led to DOE improving the design, correcting construction deficiencies noted, as well as starting actions to correct identified issues. Some of these actions are:

Hanford Waste Treatment Plant. The Board has continued its extensive review of the design and construction of important-to-safety structures, systems, and components in the Waste Treatment Plant facilities. Numerous deficiencies and concerns have been identified during these reviews. For example:

- The Board had earlier identified that the DOE-specified seismic requirements may not have been sufficiently conservative. DOE evaluation of this concern identified that the seismic requirements were underestimated by about 40 percent. DOE and its contractor are now evaluating the impact this increase will have on the design of the structure and equipment.

- DOE significantly underestimated the impact of hydrogen hazards on pipes and small process vessels and components. At the urging of the Board, DOE is now evaluating design solutions to address the issue.

- At the Board's suggestion, DOE completed a detailed review of the blackcell concept. Components in the blackcells will not be readily accessible for the life of the plant. This review revealed problems associated with erosion of components. DOE has now enhanced understanding of erosion and is developing a surveillance and testing program to better ensure components in the blackcells will last for the life of the plant.

- The Board has identified deficiencies in the structural evaluation methodology. An independent Peer Review Team brought on at the Board's suggestion by DOE to help with the structural evaluation agreed with the Board. DOE has now required the contractor to change its analysis methodology to correct the deficiencies.

- The Board continues to follow the status of the design and installation of fire protective coating to structural steel subsequent to DOE directing the contractor to comply with code requirements. Questions on the basis for deleting coatings on some steel have resulted in the contractor committing to develop criteria and a methodology to justify the decisions. DOE now monitors the work and recently questioned the contractor's basis for reducing the approved thickness of the applied coatings, which is still under review.

- The Board identified deficiencies with plans for protection of operators who must remain in the control room during accidents to safely shutdown the plant. WTP has now redesigned the habitability system for the emergency shutdown facility. The new design provides for a dramatic improvement in protection of the operators.

Salt Waste Processing Facility at SRS. The Board's review of the conceptual design of the Salt Waste Processing Facility identified weaknesses in the facility's design criteria for natural phenomena hazards and with DOE directives. DOE commissioned an independent review team of subject matter experts to review this issue. This independent review team agreed with the Board and made recommendations to improve the design criteria for the facility. As a result, DOE is developing new criteria to ensure that the facility design will adequately confine hazardous materials. The Board has also informed DOE of the concerns with the DOE directives associated with developing facility design criteria.

Pit Disassembly and Conversion Facility. The Board continued to review the safety of the design of the Pit Disassembly and Conversion Facility (PDCF). The Board found the Preliminary Documented Safety Analysis comprehensive and acceptable. However, the Board questioned the impact of geologic soft zones at the site and their possible impact on the PDCF plutonium processing building during a Design Basis Earthquake. Because the PDCF plutonium processing building is a bermed structure, it has much larger vertical soil stresses than other SRS buildings. Hence, surface settlement profiles at the building foundation become a critical design parameter and the details of the soft zone characteristics take on an added significance. DOE has initiated a review of this issue.

Tritium Extraction Facility. The Board continues to provide oversight of the Tritium Extraction Facility, which has completed construction and is now in the testing and startup phase. The facility has an advanced computerized process control and worker protection system. At the Board's urging, a special one week software review was conducted by experts from the NNSA Service Center, and reviews of the computerized systems have been added to the DOE Operational Readiness Review (ORR). Also, there are certain maintenance and operations evolutions that cannot be demonstrated during the ORR. At the Board's urging, DOE ORR team members are observing selected items of maintenance and operations being conducted prior to the ORR.

Los Alamos National Laboratory Chemistry and Metallurgy Research Replacement Project. The Board reviewed the major safety aspects of the Critical Decision 1 package submittal. In a letter dated February 24, 2005, the Board raised concerns with the project's acquisition strategy and compressed federal oversight schedule. In response to the letter, NNSA developed a detailed review plan that outlines direct federal involvement to monitor the integration of safety throughout the design process. The Board also identified weaknesses with the project's confinement strategy, which will be addressed during the preliminary design.

Pantex Building 12-64 Upgrade Project. The project team established an administrative limit on the quantity of high explosives to preclude failure of the roof slabs. However, the Board questioned 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.

Hanford Demonstration Bulk Vitrification Facility. During review of the preliminary design of the Demonstration Bulk Vitrification Facility, the Board identified deficiencies with the safety controls specified for protection of the workers. In particular, confinement of the hazardous material involved was not sufficient. DOE commissioned an independent review of the project safety basis and confinement strategy. This independent review agreed with the Board. DOE is now taking action to revise the design to provide better safety controls and confinement strategy.

Plutonium Storage at SRS. In Public Law 107-314, Section 3183, *Study of Facilities for Storage of Plutonium and Plutonium Materials at Savannah River Site*, Congress tasked the Board to conduct a study of the adequacy of K-Area Materials Storage facility (KAMS) and related support facilities such as Building 235-F (235-F), at SRS. In 2005, the Board issued its annual update to Congress. The Board proposed nine actions it considered necessary to enhance safety, reliability, and functionality of the plutonium storage facilities at SRS. Based in part on these extensive proposals, DOE has now decided against using 235-F and is now consolidating its plutonium in KAMS. DOE has agreed with the proposals to upgrade KAMS and is evaluating implementation of the needed actions.

Highly Enriched Uranium Manufacturing Facility at Y-12 National Security Complex. The Board has completed its design reviews of the High Enriched Uranium Materials Facility (HEUMF) and believes the design will adequately protect the public and workers. Some design enhancements remain to be implemented. For example, the contractor has agreed to correct emergency lighting deficiencies—system components are not seismically qualified, subjecting the building to a total blackout during an earthquake. The contractor will analyze

the ability of the safety controls to protect against large fires involving canned subassemblies. The project configuration management system is being upgraded.

Performance Goal 3	Nuclear Facilities Design and Infrastructure. New DOE defense nuclear facilities, and modifications to existing facilities, are designed and constructed in a manner that ensures adequate protection of the health and safety of the workers and the public.

FY 2004 Accomplishments

Plutonium Storage at SRS. In Public Law 107-314, Section 3183, *Study of Facilities for Storage of Plutonium and Plutonium Materials at Savannah River Site*, Congress tasked the Board to conduct a study of the adequacy of K-Area Materials Storage facility (KAMS) and related support facilities such as Building 235-F (235-F), at the Savannah River Site (SRS) in South Carolina. In FY 2004, the Board issued its initial report as well as a follow up report to Congress. The Board proposed nine actions it considered necessary to enhance safety, reliability, and functionality of the plutonium storage facilities at SRS. DOE has agreed with the proposals and is currently evaluating implementation of appropriate actions during the next year.

Hanford Waste Treatment Plant Design and Construction. The Board has continued its extensive review of the design and construction of important to safety structures, systems and components in the Waste Treatment Plant facilities. Numerous deficiencies and concerns have been identified during these reviews, for example:

- The contractor had planned to eliminate much of the fire-resistive coatings on the structural steel used in the facilities. Eliminating the coatings is inconsistent with DOE's own requirements as well as industry standards. This decision is now being reversed.

- The cesium ion exchange system could accumulate explosive concentrations of hydrogen gas. Furthermore, the hydrogen generation rates, hydrogen gas retention and release in waste tanks, and the ability of the mixing systems to prevent gas accumulation in the stored high-level waste tanks was not understood. DOE has now added an inerting system to the cesium ion exchange system to manage hydrogen flammability.

- One of the facilities in the WTP contains areas that by design will not be accessible after construction. The Board was concerned that the design of equipment in these areas were not sufficiently robust to operate normally for 40 years without maintenance. The Board encouraged DOE to further evaluate the performance criteria and validate that this equipment could in fact be expected to perform for this extended period of time. DOE conducted the study and is now correcting noted deficiencies and is also considering providing limit access to the areas for maintenance.

- In response to Board concerns with the large number of weld defects and missing leak tests for a high-level waste vessel, DOE performed root cause analyses which identified significant weaknesses in vessel technical specifications, fabrication oversight, and engineers' understanding of safety requirements. DOE is now implementing corrective actions for these weaknesses.

- DOE proposed delegating its approval of safety-related expectations (codes, major design changes, and safety control modifications) to the contractor. As a result of the Board's objections, DOE significantly modified their process and maintained their control of the standards and design of the Waste Treatment Plant.

- The criteria proposed by the contractor to be used to accept a new, experimental concrete mixture was inadequate. As a result, additional acceptance criteria were developed to ensure the concrete's quality would be suitable.

- In response to Board concerns with the large number of weld defects and missing leak tests for a high-level waste vessel, DOE performed root cause analyses which identified significant weaknesses in vessel technical

specifications, fabrication oversight, and engineers' understanding of safety requirements. DOE is now implementing corrective actions for these weaknesses.

- **High Enriched Uranium Materials Facility at Y-12 National Security Complex.** The Board has continued its design reviews of the High Enriched Uranium Materials Facility (HEUMF). Based on detailed reviews, the Board identified concerns with important safety systems such as the structure, electrical, ventilation, and instrument and control (I&C) systems. Based on these Board concerns, the contractor has made the electrical design more reliable, added concrete details to the structure to better resist an earthquake, and is actively working to resolve additional safety concerns raised by the Board.

Pit Disassembly and Conversion Facility. The Board has been reviewing the structural design for the Pit Disassembly and Conversion Facility (PDCF) to be located at the Savannah River Site. The Board has ensured the structural design criteria were adequate, the geotechnical evaluations were appropriate, and the soil-structure interaction (SSI) analysis was adequate for the PDCF structures. In response to a Board letter dated May 13, 2003, 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.

Pantex Building 12-64 Upgrade. In a letter dated October 10, 2003, the Board noted that DOE was not addressing the structural weaknesses of the bays in Building 12-64 during conceptual design of upgrades. The Board emphasized the need to improve the structure's ability to withstand a potential earthquake and to establish a limit on explosive loading that appropriately accounts for known design deficiencies in the facility structure. As a result, the project was modified to include a structural repair to the building that should significantly reduce the likelihood of facility failure during an earthquake. In addition, the project has worked toward establishing an appropriate explosives limit to preclude impacting nearby facilities should there be an explosion.

High Efficiency Particulate Air Filter Testing at the Savannah River Site. High Efficiency Particulate Air (HEPA) filters provide an important confinement safety function in many DOE nuclear facilities. The Secretary of Energy committed to the Board to maintain the Filter Test Facility (FTF) in Oak Ridge, Tennessee, and to independently test important-to-safety HEPA filters to ensure they will perform as expected. In July 2003, the Board noted that the Savannah River Site (SRS) had been installing HEPA filters in safety class and safety significant applications in nuclear facilities without testing the filters at the FTF. In response to the Board SRS replaced the vast majority of the incorrectly installed filters, and will replace the remaining few filters in the near future.

Nuclear Air Cleaning Handbook. The Board has urged DOE to issue an update to the *Nuclear Air Cleaning Handbook*, DOE-HDBK-1169, which forms the technical basis for the ventilation systems in most DOE nuclear facilities. The previous version was published in 1976. After much involvement by the Board, DOE issued an update to this important handbook in December 2003. The Board will continue to ensure that the handbook is appropriately implemented.

Salt Waste Processing Facility at the Savannah River Site. The Salt Waste Processing Facility will be used to remove cesium, strontium and actinides from high-level waste before it is vitrified. In a June 18, 2004 letter the Board outlined safety risks associated with delays to the salt processing program and urged DOE not to eliminate funding for this important work. DOE has restored funding and is now pursuing a sound program plan that will accelerate waste stabilization and risk reduction.

Hanford Plutonium Finishing Plant. Previously the Board identified electrical deficiencies at the Plutonium Finishing Plant. 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 this fiscal year, the contractor evaluated this situation and in June 2004 concluded that many of the electrical system protective devices

in the facility have been applied above their rated capability resulting in an unsafe condition and a violation of the National Electrical Code. Actions to correct this situation are underway.

Electrical Safety Handbook. In a letter to DOE dated August 7, 2003, the Board identified weaknesses with the proposed revision to the Electrical Safety Handbook, DOE-HDBK-1092-98. The Board requested that DOE provide effective, detailed guidance to contractors on electrical safety programs. In July 2004, DOE revised the handbook to include the details of electrical safety and guidance for an effective electrical safety program. This version is under review.

GOAL 4 —NUCLEAR SAFETY PROGRAMS AND ANALYSIS

Performance Goal 4	**Nuclear Safety Programs and Analysis.** DOE regulations, requirements, and guidance are developed, implemented, and maintained; and safety programs at defense nuclear facilities are established and implemented; as necessary to protect adequately the health and safety of the workers and the public.

FY 2006 Performance Accomplishments

DOE Directives. As part of its ongoing review of new and revised DOE directives, the Board and its staff evaluated and provided constructive critiques of 32 directives associated with, but not limited to nuclear design criteria, maintenance management, worker protection, emergency management, and project management. At year's end, both staffs were in the process of resolving issues on 12 pending directives to improve the content, clarity, and consistency in safety requirements and guidance. Examples of completed directives include:

- DOE Order 151.1X, Comprehensive Emergency Management System
- DOE Order 251.1X, Directives Program
- DOE Order 420.1B, Facility Safety
- DOE Guide 424.1-1A, Implementation Guide for use in Addressing Unreviewed Safety Question Requirements
- DOE Order 452.1C, Nuclear Explosive and Weapon Surety Program
- DOE Order 452.2C, Safety of Nuclear Explosive Operation
- DOE Standard 1104, Review and Approval of Nuclear Facility Safety Basis Documents

Recommendation 2004-2. The Board issued Recommendation 2004-2, *Active Confinement Systems*, in December 2004, to ensure that a reliable and effective control would be available to mitigate the consequences of potential accidents at defense nuclear facilities. DOE has now screened all hazard category 2 and 3 defense nuclear facilities against criteria designed to identify those with the potential for benefiting from the intent of the Recommendation. DOE also completed another major milestone in February 2006, developing and issuing its Ventilation System Evaluation Guidance document. This document identifies a set of design and performance attributes that ventilation systems can be evaluated against for identification of potential upgrades. Several pilot facilities have been identified by DOE to which these attributes will be applied, in order to identify potential improvements, before the guidance document is applied to the rest of hazard category 2 and 3 facilities that were screened and identified earlier in the year. The evaluation process will be completed over the next two years, resulting in significant improvement in the safety posture of defense nuclear facilities across the complex.

DOE Technical Capability. In response to the Board's Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*, DOE is making progress in a number of areas:

- In May 2006, DOE conducted the initial accreditation review of the Technical Qualification Program (TQP) at the site office for the Y-12 National Security Complex. The Y-12 Site Office had a solid program and served as a good benchmark for this accreditation process.

- DOE budgeted $2M for FY08 to re-establish the Corporate Technical Intern Program, which would fund ten interns.

- DOE developed and executed a Senior Technical Safety Manager (STSM) overview course in Albuquerque in February 2006 for qualified STSMs in the process of requalification and for new STSM candidates to assess gaps in their knowledge level. DOE will use lessons learned from this course to improve its next scheduled

course. Additionally, DOE is strengthening its STSM qualification criteria with mandatory performance activities through a significant revision to DOE-STD-1075, *Senior Technical Safety Manager Functional Area Qualification Standard*. DOE expects to issue this standard later this year.

- **Recommendation 2004-1.** In 2006, the Board issued technical report, DNFSB/TECH-36, *Integrated Safety Management: The Foundation for an Effective Safety Culture*. The report examines the current status of the effectiveness of integrated safety management (ISM) systems at the seven NNSA weapons sites, summarizes failures and good practices, and proposes changes to enhance the effectiveness of ISM. In response to Recommendation 2004-1, DOE completed the following actions in 2006: DOE designated an ISM Champion to chair an ISM Champions Council, which will assist in developing and sustaining vital, mature ISM systems throughout the Department; established two Central Technical Authorities (CTAs) with associated technical support staff; issued a new DOE policy and order on DOE oversight; implemented a nuclear safety research function; strengthened the technical qualification program for Federal safety assurance personnel; implemented a formal safety delegation and assignment process; and took steps to improve the implementation of the ISM "feedback and improvement" function, including issuance of a new DOE Order describing the Operating Experience Program. However, DOE has recently begun to take actions to withdraw from several of these commitments and is in the process of revising the implementation plan for the recommendation, which will require significant Board oversight in 2007.

Administrative Controls. In Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*, the Board identified the need for DOE to improve its guidance and expectations with respect to important administrative controls at defense nuclear facilities. As a result of the Board's Recommendation, the Department developed and implemented a plan to improve the reliability and effectiveness of administrative controls that serve in safety functions. DOE developed a new standard governing the development and implementation of specific administrative controls in the defense nuclear complex. Additionally, DOE has developed a set of training materials to introduce the new and revised requirements to its field elements and has taken actions to verify the adequacy and implementation of the revised guidance and expectations throughout the complex. Further, DOE has made significant revisions to the "safe harbor" methodologies used to comply with 10 CFR 830, *Nuclear Safety Management*, to codify and incorporate the provisions of the Recommendation. With the exception of the completion of several annual updates, DOE has indicated that it believes that all of the commitments associated with the Recommendation have been met. The Board will work to evaluate the effectiveness and implementation of DOE's efforts in satisfying these commitments in 2007.

Use of Quantitative Risk Assessment Methodologies. The Board continues to follow DOE's activities associated with the use of quantitative risk assessment at defense nuclear facilities. Previously, the Board conducted a comprehensive assessment of DOE's policies, programs, processes, and procedures with respect to the use of quantitative risk assessment and related methodologies. The Board's review suggested that DOE and its contractors have employed quantitative risk assessment in a number of activities, including the development of documented safety analyses and other facility-level decision making activities. The precise use, as well as the level of formality of these assessments, varied over a wide range. As a result of the Board's observations and concerns, DOE has chartered a working group comprised of representatives from the major program offices, field elements, national laboratories, and major contractors to guide the efforts in this area. This group has worked to develop a draft policy, along with draft implementation guidance, which is scheduled to be released for general comment later this year. The Board will continue to oversee DOE's progress in developing an effective policy, along with useful implementing guidance, to govern the use of risk assessment methodologies at DOE facilities.

Nuclear Criticality Safety. Concerns expressed by the Board regarding the lack of NCS site reviews led to the establishment of a formal program to monitor contractor and federal NCS programs across the complex. The reviews are performed using senior contractor and federal NCS personnel; results of these reviews will be a component of subsequent DOE NCS Annual Reports. In response to the DOE FY 2005 NCS Annual Report, the

Board requested additional information from DOE for three items: an updated schedule for relocation of critical experimental capability from Los Alamos National Laboratory (LANL) to the Nevada Test Site; an analysis of DOE site office staffing needs for effective federal NCS oversight and plans to fill those positions; and the latest status and schedule for conducting NCS engineer training classes, which had been discontinued at LANL in 2004. DOE is preparing its response.

Implementation of ISM: Activity-Level Work Planning. In 2006, the National Nuclear Security Administration completed work on its expectations of the contractors' work planning and control processes, as well as criteria and review approach documents to comprehensively assess these processes for the first time. These documents will assist the sites in their goal of continuously improving worker safety. Based upon these documents and similar criteria and review approach documents developed by DOE's Office of Environmental Management, reviews were conducted at each of the sites to determine the baseline state of the work planning and control process. From this baseline, DOE has committed to take actions that will improve work planning and control at the sites as a part of the Recommendation 2004-1 Implementation Plan. Since that time, DOE has identified that the specific commitments will not be met as identified in the recommendation 2004-1 Implementation Plan, but that other actions will be taken as a part of the normal oversight of the sites. The Board will continue to work with them throughout FY 2006 to improve performance in this key area.

Recommendation 2002-1, *Quality Assurance for Safety-Related Software.* This recommendation was issued to correct problems caused by inadequate design, implementation, testing, and configuration management of safety-significant computer software. During the past year, DOE has completed identification, selection, and assessments of safety system software and firmware at its defense nuclear facilities. In addition, DOE has made some progress in properly training and qualifying personnel assigned to software quality assurance (SQA) positions to the requirements of DOE-STD-1172-2003, *Safety SQA Functional Area Qualification Standard.* Finally, DOE has issued three SQA-related directives and has revised DOE Manual 411.1C, *Safety Management Functions, Responsibilities and Authorities Manual* to reflect software-related organizational changes and responsibilities. Overall, DOE's ability to assure the validity of safety information developed by use of software is improving.

Performance Goal 4	**Nuclear Safety Programs and Analysis.** DOE regulations, requirements, and guidance are developed, implemented, and maintained; and safety programs at defense nuclear facilities are established and implemented; as necessary to protect adequately the health and safety of the workers and the public.

FY 2005 Performance Accomplishments

DOE Directives. As part of its ongoing review of new and revised DOE directives, the Board and its staff evaluated and provided constructive critiques of 32 directives associated with, but not limited to, worker protection management, electrical safety, quality assurance, internal and external dosimetry, and natural phenomena hazard mitigation. At year's end, both staffs were in the process of resolving issues on 17 pending directives to improve the content, clarity, and consistency in safety requirements and guidance. At year's end, both staffs were in the process of resolving issues on 19 pending directives to improve the content, clarity, and consistency in safety requirements and guidance. Examples include:

- DOE Order 251.1X, *Directives Program*
- DOE Order 151.1X, *Comprehensive Emergency Management System*
- DOE Standard 1104, *Review and Approval of Nuclear Facility Safety Basis Documents*
- DOE Order 420.1B, *Facility Safety*

Electrical Safety Handbook. The Board identified weaknesses with the proposed revision to the *Electrical Safety Handbook*, DOE-HDBK-1092-98, and requested that DOE provide effective, detailed guidance to contractors on electrical safety programs. In December 2004, DOE issued the revised handbook.

Administrative Controls. In Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*, the Board identified the need for DOE to improve its guidance and expectations with respect to important administrative controls at defense nuclear facilities. As a result of the Board's Recommendation, the Department developed and implemented a plan to improve the reliability and effectiveness of administrative controls that serve in safety functions. DOE developed a new standard governing the development and implementation of specific administrative controls in the defense nuclear complex. Additionally, DOE has developed a set of training materials that were used to introduce the new and revised requirements to its field elements. Further, as a result of the Recommendation, DOE is actively verifying the adequacy and implementation of the revised guidance and expectations throughout the complex. The Board continues to work closely with DOE to finalize the guidance to ensure that proper safety focus is afforded to administrative controls that provide important safety-related functions at DOE facilities.

Review of Documented Safety Analyses, Safety Basis Assumptions, and Safety Programs. 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. The Board conducted numerous reviews of the safety bases throughout the DOE complex. The Board reviewed the critical assumptions used in the development of the safety bases as well as the control strategies used to prevent and mitigate accident scenarios of concern. The Board identified a number of specific weaknesses in the development and implementation of the safety bases at defense nuclear facilities. In particular, the Board highlighted concerns with the safety bases at the Nevada Test Site's Device Assembly Facility (DAF), as well as the training program at the DAF. Further, the Board continues to closely follow site specific concerns at the Pantex plant involving a number of weaknesses in the tooling program. As a result of these concerns, DOE and its contractors are implementing corrective actions to address these issues.

Use of Quantitative Risk Assessment Methodologies. The Board continues to follow DOE's activities associated with the use of quantitative risk assessment at defense nuclear facilities. Previously, the Board conducted a comprehensive assessment of DOE's policies, programs, processes, and procedures with respect to the use of quantitative risk assessment and related methodologies. The Board's review suggested that DOE and its contractors have employed quantitative risk assessment in a number of activities including the development of documented safety analyses and other facility-level decision making activities. The precise use, as well as the level of formality of these assessments, varied over a wide range. As a result of the Board's observations, DOE has developed a draft policy governing the use of risk assessment methodologies at defense nuclear facilities.

Oversight of Complex, High-Hazard Nuclear Operations. From 2003-2004, the Board conducted eight public hearings to examine DOE's and NNSA's current and proposed methods of ensuring safety at its defense nuclear facilities. The Board cautioned DOE and NNSA 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. 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. From these hearings, the Board concluded that there was cause for concern with regard to the potential increase in the possibility of nuclear accidents as evident in: (1) the increased emphasis on productivity at the possible expense of safety, (2) the loss of technical competency and understanding at senior management levels within 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.

On May 21, 2004, the Board issued Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*, to ensure that any fundamental reorganization at DOE and NNSA 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. On July 21, 2004, the Secretary of Energy accepted the Board's Recommendation, however, the DOE implementation plan submitted to the Board on December 23, 2004, did not provide sufficient emphasis and detail that would strengthen DOE's federal safety assurance, ability to learn from internal and external operating experience, or revitalize Integrated Safety Management (ISM). The Board rejected the implementation plan in a letter to DOE on February 14, 2005, and identified areas requiring further attention. Since that time, DOE has delivered a more thorough implementation plan, which was accepted by the Board on August 5, 2005, and has taken steps to create a DOE and an NNSA Office of the Central Technical Authority (CTA), and a Nuclear Safety Research function. DOE has also issued two DOE directives on DOE Oversight process. The Board will continue monitor DOE's progress in upgrading its technical staffing and qualification of federal safety assurance personnel, establishing new processes and criteria for safety delegations, implementing its Operating Experience Program, and reinvigorating its ISM System to improve its work planning and work control.

NNSA Facility Representative Staffing and Training. In March 2004, the Board conducted on-site reviews of the staffing levels and training of Facility Representatives (FR) at the Pantex Site Office, the Sandia Site Office, and the Los Alamos Site Office. The Board observed that these three NNSA sites were not staffed with a sufficient number of FRs to perform their facility oversight responsibilities. Further, two sites had been under reporting their FR staffing needs for the past four years. Contributing to this deficiency is that the guidance in the FR staffing analysis in DOE-STD-1063-2000, *Facility Representatives*, did not adequately account for all of the hazardous facilities for which DOE and NNSA have oversight responsibility, and did not capture all of the FR work demands. During the review, the FR continuing training programs were found to be unstructured, informal, and generally weak in execution. In a letter dated May 14, 2004, the Board noted these concerns. During latter part of 2004 and into 2005, NNSA has taken steps to improve its activity-specific hazard training for Facility Representatives. NNSA also developed and executed a more rigorous staffing analysis that determined that 20 additional Facility Representatives were needed at six NNSA sites. Actions to hire 10 FRs for this fiscal year are underway, and a budget request for 10 more FR positions has been submitted for FY2006. Additionally, the guidance for the FR staffing analysis in DOE-STD-1063-2000 is being revised, and projected for re-issuance in mid-2006.

Software Quality Assurance (SQA). The Board issued Recommendation 2002-1, *Quality Assurance for Safety-Related Software*, to correct problems caused by inadequate design, implementation, testing, and configuration management of safety-significant computer software. During the past year, DOE has completed identification, selection, and assessments of safety system software and firmware at its defense nuclear facilities. In addition, DOE has made some progress in properly training and qualifying personnel assigned to SQA positions to the requirements of DOE-STD-1172-2003, *Safety SQA Functional Area Qualification Standard*. Finally, DOE has issued three SQA-related directives and has revised DOE M 411.1C, *Safety Management Functions, Responsibilities and Authorities Manual* to reflect software-related organizational changes and responsibilities.

Performance Goal 4	**Nuclear Safety Programs and Analysis.** DOE regulations, requirements, and guidance are developed, implemented, and maintained; and safety programs at defense nuclear facilities are established and implemented; as necessary to protect adequately the health and safety of the workers and the public.

FY 2004 Performance Accomplishments

10 CFR 851, *Worker Safety and Health.* The Bob Stump National Defense Authorization Act, Public Law 107-314, directed DOE to promulgate regulations on worker safety and health, rather than rely exclusively on a contractual approach to establish safe and healthy workplaces. On December 8, 2003, DOE provided notification of a proposed rule on worker protection, Title 10 Code of Federal Regulations, Part 851 (10 CFR 851), *Worker Safety and Health*, in the Federal Register. The Board is required by law to review and evaluate all applicable DOE Orders, regulations, and requirements. The Board conducted a detailed review of the proposed rule and provided comments to DOE on January 23, 2004. As a result, the Secretary suspended the rulemaking until the Board's issues could be resolved. The Board worked closely with DOE to develop a new regulation, and in June 2004 a draft of the revised rule was sent to the Office of Management and Budget to be prepared for publication in the Federal Register. The new rule will assist in implementing Integrated Safety Management at the activity level, helping to assure the safety of the workforce.

Software Quality Assurance (SQA). The Board issued Recommendation 2002-1, *Quality Assurance for Safety-Related Software*, to correct problems caused by inadequate design, implementation, testing, and configuration management of safety-significant computer software. During the past year, DOE has responded to the Recommendation by developing new directives for SQA and software safety, training personnel whose duties involve SQA, and improving the quality of selected software codes used across the complex for the analysis of potential accidents.

Implementation of ISM: Activity-Level Work Planning. The Board reviewed the incorporation of safety into work planning at several NNSA sites, evaluating how each site accomplished the five ISM core functions (define the scope of work, analyze the hazards, develop and implement controls, perform the work, and provide feedback and continuous improvement) for programmatic work as well as maintenance. The Board's reviews revealed significant deficiencies in the ability to effectively incorporate ISM into the process for work planning and control. Problems were noted in the tailoring of generic work documents, the processes used to identify and analyze hazards, the development of appropriate and unambiguous controls to be included in work packages, the use of a hierarchy of controls, and the ability to effectively identify areas for improvement and take action accordingly. In a letter dated May 21, 2004, the Board noted that actions to address some of these issues were being developed; however, significantly more senior management attention was required. DOE and NNSA are just beginning to address these issues. The Board will continue to work with them throughout FY 2005 to improve performance in this key area.

Site Specific Safety Reviews. 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. The Board conducted numerous reviews of the site-specific safety bases throughout the DOE complex. In particular, the Board reviewed the critical assumptions used in the development of the safety bases as well as the control strategies used to prevent and mitigate accident scenarios of concern for facilities and activities such as the Savannah River Site (SRS) and Hanford tank farms, the Waste Isolation Pilot Plant (WIPP) Mobile Waste Characterization and Loading Units, the Pantex Plant Onsite Transportation Program, Los Alamos National Laboratory's "Armando" subcritical experiment, Hanford Spent Nuclear Program's Sludge Removal Project, Sandia National Laboratories' Auxiliary Hot Cell Facility, and the Nevada Test Site (NTS) Device Assembly Facility, G-tunnel, and Onsite Transportation Programs. During the course of these reviews, the Board identified a number of specific instances where

inappropriate assumptions and methodologies were used in the development of safety bases. These included analyses which did not always use bounding input assumptions and which implicitly credited non-qualified plant indications and equipment in the development of the safety analyses. These deficiencies resulted in situations where the safety analyses may not have appropriately bounded the actual hazard conditions for the facilities concerned. As a result of these concerns, DOE/NNSA and its contractors have implemented a number of corrective actions to address these issues. For example:

- At the Pantex Plant, multi-unit nuclear explosive operations remain suspended for the present until further testing and analysis can resolve the concerns or until adequate controls can be developed. Additional controls have also been imposed on some operations to assure safety given new information regarding electro-static discharge environments.

- At the Hanford Tank Farms, DOE rewrote the Technical Safety Requirements to reinstate key controls (such as Process Control Plans) that the Board had discovered were improperly eliminated. A second independent review was convened to ensure all safety controls had been implemented. The contractor has increased the frequency of taking key tank waste measurements so that current waste conditions were better understood, due to the Board's discovery that the contractor had inadvertently put a tank at risk of retaining and releasing significant quantities of flammable gas.

- DOE is revising the Basis for Interim Operation (BIO) 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.

Recommendation 2002-3. In Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*, the Board identified the need for DOE to improve its guidance and expectations with respect to important administrative controls at defense nuclear facilities. As a result of the Board's Recommendation, the Department has developed and implemented a plan to improve the reliability and effectiveness of administrative controls that serve safety functions. Recent efforts have focused on development of a draft standard governing the development and implementation of specific administrative controls in the defense nuclear complex. Additionally, DOE has developed a set of training materials to be used to introduce the new and revised requirements to its field elements. The Board continues to work closely with DOE to finalize this guidance to ensure that a proper safety focus is afforded on administrative controls that provide important safety-related functions.

NNSA Training and Qualification. The Board noted concerns with Federal oversight of training and qualification at the Pantex Plant. Most notably, required reviews of contractor training and qualification programs were not being performed. In July, the Board broadened its review to all National Nuclear Security Administration (NNSA) sites, citing the concern that failure to verify the adequacy of training and qualification programs would raise questions regarding the reliability of the significant number of administrative control programs within the NNSA system. In response, NNSA initiated a review at all field sites, and identified three sites, in particular, that did not meet program requirements. However, by August 2004, the Board found that senior NNSA management had not taken prompt action to upgrade the programs at these three sites. A letter to NNSA identified this situation as unacceptable—NNSA was given 45 days to define the bounds of the problem, and 30 days to develop a corrective action plan.

Functions Responsibilities and Authorities (FRA) Documents. The Board continued to follow DOE activities in the closure process associated with Recommendation 98-1, *Resolution of Issues Identified by DOE Internal Oversight*. DOE is also obligated under DOE Manual 411.1, *Safety Management Functions Responsibilities and Authorities (FRA) Manual* to annually update the FRA Manual to reflect changes in organizational responsibilities and authorities. After significant effort on the part of the Board, DOE has developed a credible FRA Manual at the

corporate level, and sub-tier FRAs in key DOE organizational elements (e.g., the Office of Environmental Management, and NNSA). The Board will continue to work with the DOE program offices throughout FY 2004 to refine their FRA documents to ensure safety roles and responsibilities are clearly defined.

NNSA's Facility Representative Staffing and Training. In a letter dated May 14, 2004, the Board noted concerns with the insufficient staffing levels of Facility Representatives (FR), and the inadequate level of activity-specific hazards training, at the Pantex Site Office, the Sandia Site Office, and the Los Alamos Site Office. The Board broadened their concern to all NNSA sites, citing a concern that inadequate staffing of FRs at the NNSA sites will result in significant challenges to NNSA's ability to monitor nuclear weapon activities and perform assigned safety responsibilities. In response, NNSA is taking steps to improve its activity-specific hazard training for FRs, and will conduct more rigorous staffing analyses to ensure that staffing levels for NNSA's FRs are sufficient.

APPENDIX B: LIST OF ABBREVIATIONS AND ACRONYMS

BIO	**Basis for Interim Operations**
CD	**Critical Decision**
CFR	**Code of Federal Regulations**
CTA	**Central Technical Authorities**
CY	**Calendar Year**
DAF	**Device Assembly Facility**
D&D	**Deactivation and Decommissioning**
DNFSB	**Defense Nuclear Facilities Safety Board**
DOE	**(U.S.) Department of Energy**
EH	**DOE Office of Environment, Safety and Health**
EM	**DOE Office of Environmental Management**
FBWT	**the Fund Balance with Treasury**
FR	**Facility Representative**
FRA	**Functions, Responsibilities, and Authorities (Manual)**
FTF	**Filter Test Facility (at Oak Ridge)**
FY	**Fiscal Year**
GSA	**General Services Administration**
GPRA	**Government Performance and Results Act**
HLW	**High-Level (radioactive) Waste**
HEPA	**High-Efficiency Particulate Air (filter)**
HEUMF	**Highly Enriched Uranium Materials Facility**
HLW	**High-Level Waste**
I&C	**Instrumentation and Control**
IEEE	**Institute of Electrical and Electronics Engineers**
INEEL	**Idaho National Engineering and Environmental Laboratory**
ISM	**Integrated Safety Management**
JCO	**Justification for Continuing Operation**
KAMS	**K-Area Material Storage (at SRS)**
LANL	**Los Alamos National Laboratory**
LLNL	**Lawrence Livermore National Laboratory**
NCS	**Nuclear Criticality Safety**
NNSA	**National Nuclear Security Administration**
NTS	**Nevada Test Site**
OMB	**Office of Management and Budget**
ORNL	**Oak Ridge National Laboratory**
ORR	**Operational Readiness Review**
PAR	**Performance and Accountability Report**
PDCF	**Pit Disassembly and Conversion Facility (at SRS)**
PDP	**Professional Development Program**
PDSA	**Preliminary Documented Safety Analysis**
RFETS	**Rocky Flats Environmental Technology Site**
SDOR	**Saltless Direct Oxide Reduction**
SNL	**Sandia National Laboratories**
SQA	**Software Quality Assurance**
SRL	**Special Recovery Line**
SRS	**Savannah River Site**
SS-21	**Seamless Safety for the 21st Century**
STSM	**Senior Technical Safety Manager**

APPENDIX B: LIST OF ABBREVIATIONS AND ACRONYMS (continued)

TSR	**Technical Safety Requirement**
USQ	**Unreviewed Safety Question**
WEF	**Waste Examination Facility (at NTS)**
WETF	**Weapons Engineering Tritium Facility (at LANL)**
WIPP	**Waste Isolation Pilot Plant**
WTP	**Waste Treatment Plant (at Hanford)**
Y-12	**Y-12 National Security Complex**
^{229}Th	**Thorium-229**
^{233}U	**Uranium-233**
^{238}Pu	**Plutonium-238**