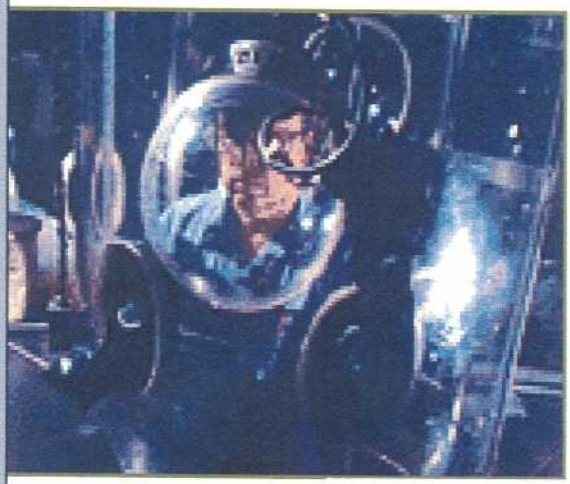
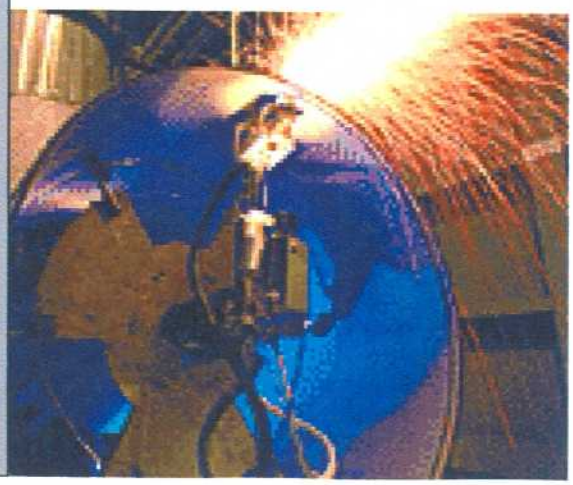
FY 2006 PERFORMANCE AND ACCOUNTABILITY REPORT

DEFENSE NUCLEAR FACILITIES SAFETY BOARD



UNITED STATES OF AMERICA
SALUS ATQUE SECURITAS
DEFENSE NUCLEAR FACILITIES SAFETY BOARD



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Chairman's Message

On behalf of the Members and staff of the Defense Nuclear Facilities Safety Board (DNFSB), I am pleased to submit our *Performance and Accountability Report* (PAR) for FY 2006. I am especially pleased as this year's report represents a milestone for DNFSB. Building on our FY 2004 and FY 2005 experiences (FY 2004 was the first year DNFSB was required to prepare and submit a PAR), the DNFSB has applied many of the "lessons learned" from these two prior PAR efforts to improve FY 2006 operations and our PAR preparation effort. The result is that this year's PAR report is DNFSB's first to be submitted with financial statements that have received an unqualified (i.e., "clean") audit opinion.

The primary purpose for the DNFSB's existence 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 DNFSB has been 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 DNFSB 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 would result in catastrophic impacts on lives and property, as well as cripple our Nation's nuclear deterrent capability. The DNFSB is the last line of defense in preventing serious safety vulnerabilities and tragic accidents from occurring in very complex, dangerous DOE defense nuclear facilities.

During FY 2006, the DNFSB continued to make significant progress in ensuring that the public and the workers at or near DOE defense nuclear facilities are adequately protected. Considering that the DNFSB is a small agency (100 FTEs) with new budget authority of $21.8 million in FY 2006, I am proud to recognize the sustained and dedicated effort of our staff. The detailed performance reports that appear later in this document attest to the accomplishments of our small but highly talented staff. Given the scope and significance of our health and safety oversight responsibilities, the performance accomplishments far exceed the level of resources invested.

The DNFSB 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 those related to the FMFIA (reference page 16 under the Management Discussion and Analysis chapter), exist.

The future holds many managerial challenges for the DNFSB, 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 fiscal challenges involving adequate funding for oversight activities and human capital issues will become critical to the viability of future DNFSB operations.

The DNFSB is committed to improving 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 placed in more secure and stable storage 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, 2006

Chapter 1
Management's Discussion and Analysis

INTRODUCTION

This Performance and Accountability Report (PAR) summarizes the Defense Nuclear Facilities Safety Board's (DNFSB) oversight activities and associated resource expenditures for the period from October 1, 2005 through September 30, 2006 (FY 2006). 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. FY 2006 is the third year that the DNFSB 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 DNFSB's *Strategic Plan for FY 2003-2009* has been made 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 DNFSB's performance objectives for FY 2007 and FY 2008, as well as representative accomplishments for FY 2003 through 2005, will be included in its FY 2008 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 DNFSB operations, and is divided into five sections: *About the DNFSB* describes the agency's mission, organization structure, and the four major performance goals of the DNFSB; *Future Challenges* includes a review of upcoming issues; *Program Performance Overview* discusses the DNFSB's success in accomplishing its performance goals; *Financial Performance Overview* provides highlights of DNFSB'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 DNFSB

The DNFSB, 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 DNFSB 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 DNFSB commenced operations in October 1989 with the Senate confirmation of the five Board Members.

Organization

The DNFSB 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 DNFSB are designated by the President to serve as Chairman and Vice Chairman, respectively. Each DNFSB 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 DNFSB.

The DNFSB's 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 DNFSB and DOE management officials and staff, and has proven to be beneficial for the timely exchange of information as the DNFSB conducts its independent oversight mission.

The DNFSB maintains its 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, 2006, ten 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)
- Lawrence Livermore National Laboratory (LLNL)

The Site Representatives Program provides a cost-effective means for the DNFSB 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 DNFSB's budget authority for FY 2006 was $21.8 million supporting 100 full-time equivalent staff. The DNFSB'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 DNFSB.

Safety Oversight Responsibilities

The DNFSB'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.*, in which the DNFSB shall:

1. Review and evaluate the content and implementation of the standards relating to the design, construction, operation, and decommissioning of DOE's defense nuclear facilities and recommend to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected.

2. Investigate any event or practice at a DOE defense nuclear facility which the DNFSB determines has adversely affected, or may adversely affect, public health and safety.

3. Have access to and may systematically analyze design and operational data, including safety analysis reports, from DOE defense nuclear facilities.

4. Review the design and construction of new DOE defense nuclear facilities and recommend to the Secretary of Energy such modifications of the design considered necessary to ensure adequate protection of public health and safety.

5. Make such recommendations to the Secretary of Energy with respect to DOE defense nuclear facilities, including operations of such facilities, standards, and research needs, as determined to be necessary to ensure adequate protection of public health and safety.

In support of this mission, the DNFSB 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:** Reviewing the design and construction of new DOE defense nuclear facilities, and major modifications to existing facilities.

AREA 4. **NUCLEAR SAFETY PROGRAMS AND ANALYSIS:** How DOE regulations, requirements, and guidance affecting public or worker health and safety are developed, implemented, and maintained; and safety programs at defense nuclear facilities are established and implemented.

The FY 2006 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 DNFSB is facing a number of significant technical and fiscal challenges that will 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 DNFSB is obligated by law to conduct in-depth reviews of new defense nuclear facilities during design, construction, and operations. DOE has more than 20 new design and construction projects currently underway or planned for the near future. With its current allocation of resources, the DNFSB will continue to be pressed to keep pace with this significant increase in new defense nuclear facilities.

Second, DOE's nuclear weapons stockpile stewardship and management operations require particular DNFSB oversight attention due to the hazards associated with the nuclear explosive activities and experiments involving collocated high explosives and nuclear material. The DNFSB 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 various defense nuclear sites, including the Savannah River Site (SRS). The DNFSB 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 DNFSB. Because the DNFSB'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 DNFSB's mission. The loss of technical competence due to retirements 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 DNFSB 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 DNFSB 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 20 new design and construction projects currently underway. The DNFSB 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.

WTP is a complex, high risk program that has experienced significant setbacks in the early phases of design and construction. This project is the central component of DOE's strategy for successful cleanup of Hanford's tank waste legacy and will not begin full operation for more than a decade. The Secretary of Energy has recognized the health and safety importance of the DNFSB's past work in identifying unresolved seismic issues and the potential accumulation of explosive hydrogen gas in current piping and vessel designs, and relies heavily on the DNFSB to ensure that safety features are incorporated in the WTP design, based on extensive reviews by the DNFSB. These design and construction reviews are resource intensive and time consuming, but are key in preventing safety flaws in design and construction that could render a newly constructed facility unusable.

Safety of Nuclear Weapon Activities

To maintain this Nation's nuclear deterrent, DOE is accelerating its programs to extend the life of weapons in the enduring stockpile, requiring more operations to disassemble, refurbish, and reassemble nuclear weapons and components. A particularly devastating potential accident in the nuclear weapons complex would be an inadvertent nuclear detonation at either the Pantex Plant in Texas during nuclear explosive operations, or the Nevada Test Site while working on a damaged nuclear weapon or an improvised nuclear device. The DNFSB must provide comprehensive and effective oversight to ensure an accident with the absolutely unacceptable consequence of a nuclear detonation never occurs.

It had already been anticipated that the current operational tempo at both the Pantex Plant and the Y-12 Plant will increase due to increased requirements to surveil our aging nuclear weapons stockpile, particularly in the absence of underground testing, and pressure to dismantle our retired nuclear weapons as we draw down our stockpile. However, in response to Congressional oversight and criticism (based on findings from the Defense Science Board), DOE has already begun implementing plans to increase throughput in the weapons complex. This increased pressure will further tax DNFSB's already strained oversight capability at the nuclear production facilities. In addition, DOE has recently begun work on the Reliable Replacement Warhead (RRW). One of the goals of the RRW is improved safety in its manufacture and maintenance. The DNFSB will need to provide nuclear safety oversight of this activity to ensure that the promised safety improvements are achieved.

Nuclear Materials Processing and Stabilization

One of the most significant challenges facing DOE in nuclear materials processing and stabilization is managing the high-level waste (HLW) stored in underground tanks at sites such as the Savannah River Site (SRS). 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 sludges, 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 DNFSB is expected to encompass a wide variety of technical safety issues related to the chemical treatment of wastes and to the design, construction, and operations of waste treatment facilities.

Human Capital Initiatives

The means for an effective DNFSB oversight program begins with a determined, focused, and well-executed Human Capital Program. This program uses all available tools to attract and retain the technical talent necessary to accomplish the job that Congress requires the DNFSB to do. After years of careful recruiting and selection, the DNFSB's technical staff is composed of approximately 60 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 and nuclear criticality safety, and waste management. Essentially all of the technical staff has technical masters' degrees, and approximately 20 percent have doctoral degrees.

Because the DNFSB'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 DNFSB's mission.

The DNFSB began FY 2006 with 8 engineer vacancies and during the year lost 3 additional engineers. Through an aggressive recruitment program, the DNFSB hired 2 new engineers in FY 2006 (offsetting 2 of the 3 departures) and hired four additional engineers who will start work in FY 2007. The DNFSB is continuing its aggressive recruitment program and anticipates filling its remaining vacancies in FY 2007. However, the DNFSB will have to compensate for additional potential staff retirements that could reduce our technical capabilities by continuing to recruit experienced engineering talent. More than 20 percent of the DNFSB's technical staff and 33 percent of our senior executives are eligible for regular retirement today. Clearly, the combination of an aging workforce and high demand for experienced scientists and engineers will impact DNFSB operations if not dealt with effectively.

In addition to continuing our recruitment of experienced engineering talent to fill immediate staff needs, the DNFSB also needs to recruit the next generation of engineers. The DNFSB developed and previously implemented a three-year Professional Development Program (PDP), to bring entry-level technical talent into professional positions within the DNFSB. 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. This is a highly competitive program designed to attract the next generation of scientific and technical talent to Federal service.

PROGRAM PERFORMANCE OVERVIEW

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

The DNFSB 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 DNFSB 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. DNFSB 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 DNFSB'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 DNFSB. 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 DNFSB'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.

DNFSB 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 DNFSB 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 DNFSB 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 Fernald and 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 DNFSB. 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 DNFSB to stabilize and dispose of hazardous nuclear materials.

AREA 3. NUCLEAR FACILITIES DESIGN AND INFRASTRUCTURE

Performance Goal: 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.

To ensure that safety is addressed early in the process, the DNFSB 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 DNFSB'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 DNFSB'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 20 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 design and construction phase; the Highly Enriched Uranium

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 DNFSB. 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 develops, maintains, and implements regulations, requirements, and guidance; and establishes and implements safety programs at defense nuclear facilities as necessary to ensure adequate protection of health and safety of the workers and the public.

The DNFSB'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 DNFSB'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 DNFSB'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 DNFSB continues its efforts to ensure that DOE maintains a vigorous nuclear criticality safety infrastructure to support nuclear operations. The DNFSB 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.

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

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[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.

Interdependency of the Four Performance Goals:

The interdependence of these four strategic areas of concentration must be understood to appreciate the efficiency of the DNFSB's operating plan and corresponding organizational alignment. The "lessons learned" from the DNFSB's health and safety oversight activities crosscut into 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 DNFSB must assess the safety of hazardous activities that support the nuclear weapons stockpile (Area 1). To accomplish its general goal, the DNFSB 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 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 DNFSB 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 DNFSB 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 DNFSB evaluates the directives, standards, and programs governing DOE's safe performance of its hazardous defense nuclear activities. The DNFSB's first three strategic areas of concentration heavily rely upon the implementation of specific DOE rules and directives. The DNFSB's integrated, comprehensive oversight of the safety of DOE's defense nuclear facilities require that the DNFSB carefully evaluate these safety programs.

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

The DNFSB'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 DNFSB 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 DNFSB may reassign resources among these groups as necessary.

FINANCIAL PERFORMANCE OVERVIEW

As of September 30, 2006, the DNFSB had sufficient funds to conduct its health and safety oversight mission, and had adequate internal controls to ensure that obligations did not exceed its total budget authority. As with many small agencies with limited resources, the DNFSB has adopted the "economies of scale" philosophy for obtaining needed administrative support services. For financial support, the DNFSB 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 DNFSB'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

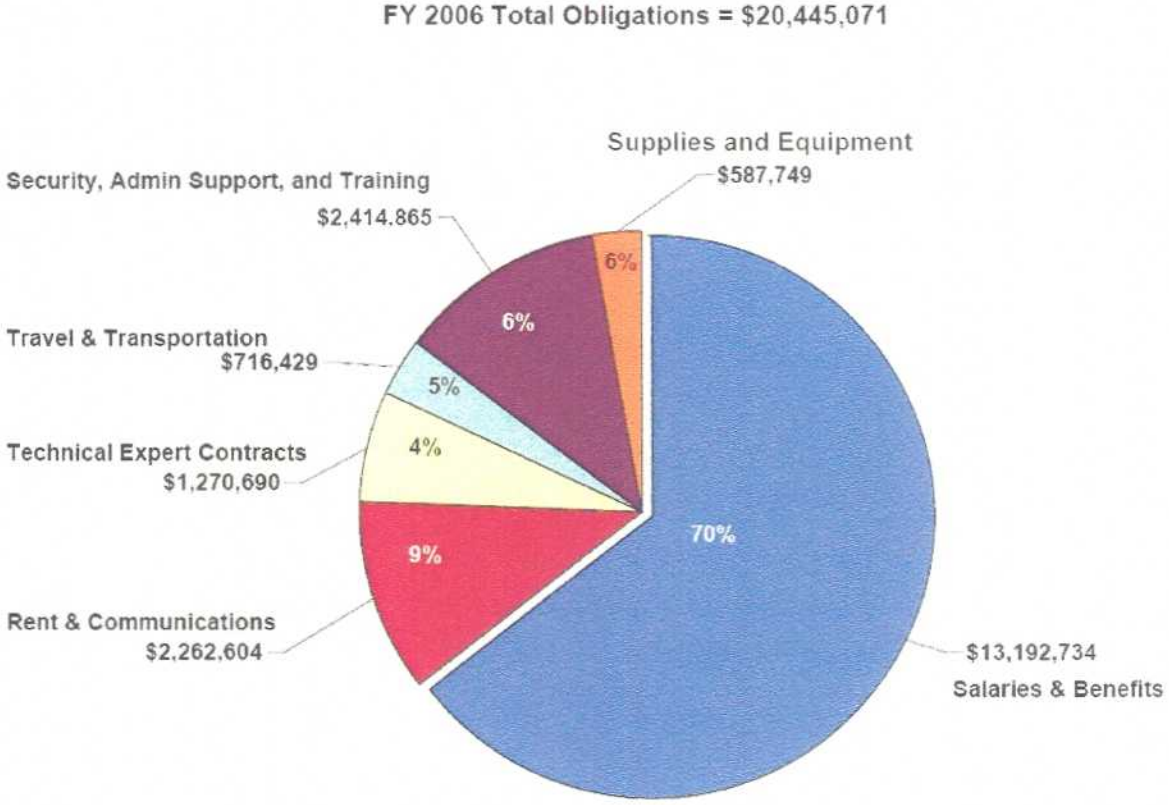
The DNFSB receives an annual appropriation, for Salaries and Expenses, with the funds made available until expended. The sources of funds available for obligation in FY 2006 and FY 2005 are listed as follows:

	FY 2006	FY 2005
New Budget Authority	$21,811,680	$20,105,856
Prior Year Unobligated Balance	1,389,721	962,560
Recovery of Prior Year Obligations & Offsetting Collections	687,412	372,271
Total Budgetary Resources	**$23,888,813**	**$21,440,687**

The DNFSB has no reimbursable work for others authority, and is not authorized to collect fees or charges for its oversight services conducted at the Department of Energy's defense nuclear facilities.

Uses of Funds by Function

The DNFSB incurred obligations of $20,445,071 in FY 2006. As shown on the chart on the following page, the FY 2006 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 DNFSB Members and employees as they conducted oversight operations.



Audit Results

The DNFSB received an unqualified audit opinion on its FY 2006 financial statements. The auditors disclosed one instance of noncompliance with laws and regulations and identified one reportable condition concerning internal control over information systems. The reportable condition was also identified in FY 2005. Although DNFSB made progress in addressing this issue in FY 2006, more remains to be done, and the agency will continue to implement corrective action in FY 2007.

The DNFSB is pleased to report that the auditors closed the two remaining prior-year reportable conditions concerning financial reporting and ownership of financial statements based on corrective actions taken by the DNFSB during FY 2006.

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

FINANCIAL STATEMENT HIGHLIGHTS

The DNFSB'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 2006	FY 2005
Total Assets	$8,731,380	$6,527,304
Total Liabilities	$2,098,122	$1,668,439
Net Position	$6,633,258	$4,858,864

The DNFSB's assets were $8,731,380 as of September 30, 2006, an increase of $2,204,076 from the end of FY 2005. Its total liabilities and net position (which together equal total assets) were $2,098,122 and $6,633,258, respectively, as of the end of FY 2006, increases of $429,683 and $1,774,394, respectively, from the end of FY 2005. The Fund Balance with Treasury (FBWT) represents the DNFSB's largest asset. The increase in FBWT was due primarily to: (1) a higher beginning balance from uobligated funds carried forward, and (2) lower personnel expenditures due to a higher employee turnover rate experienced in FY 2006. The increase in liabilities is primarily due to a more complete accrual of end-of-year expenses.

Analysis of the Statement of Net Cost

	FY 2006	FY 2005
Net Cost of Operations	$20,618,579	$20,076,655

The DNFSB's net cost of operations for the year ended September 30, 2006 was $20,618,579, an increase of $541,924 or 2.7% over the FY 2005 costs. Costs increased primarily because of 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 $1,774,394 from FY 2005 to FY 2006 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 2006, DNFSB had Total Budgetary Resources available of $23,888,813, the majority of which was derived from new budge authority. This represents an increase of $2,448,126 or 11.4% over FY 2005 budgetary resources of $21,440,687. The increase was to fund Federal pay raises and other non-discretionary compensation and benefits and to fund what was initially projected (at the time of FY 2006 budget formulation) to be a significant increase in the rent costs upon expiration of the DNFSB's lease in March, 2006.

For FY 2006, the Statement of Budgetary Resources showed DNFSB incurred obligations of $20,445,071, an increase of $394,105 or 2% over FY 2005 obligations. The increase was primarily related to the increased obligations for rent as a result of DNFSB's new lease agreement. Increases due to Federal pay raises and related benefits were offset by fewer FTEs as a result of higher than normal personnel turnover in FY 2006. Total Outlays for FY 2006 were $19,684,173 which was virtually unchanged from FY 2005 outlays.

Analysis of the Statement of Financing

The Statement of Financing is designed to provide the bridge between the accrual-based (financial accounting) information and in the Statement of Net Cost and the obligation-based (budgetary accounting) information in the Statement of Budgetary Resources by reporting the differences and reconciling the two statements. This reconciliation ensures that the proprietary and budgetary accounts in the financial management system are in balance. The Statement of Financing takes budgetary obligations of $20,445,071 and reconciles to the net cost of operations of $20,618,579 by factoring in non-budgetary resources, costs not requiring resources, and financing sources yet to be provided.

LIMITATION OF THE FINANCIAL STATEMENTS

The principle financial statements have been prepared to report the financial position and results of operations of the DNFSB, 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 DNFSB 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 DNFSB's financial statements were audited by Cotton & Company LLP.

SYSTEMS, CONTROLS, AND LEGAL COMPLIANCE

This section provides information on DNFSB'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 DNFSB's 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 DNFSB 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 — 15 Nov 06 — Date

Improper Payments Information Act

The DNFSB 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 DNFSB does not administer any entitlement, grant, or loan programs. During FY 2006, GSA and the Bureau of the Public Debt made net total payments of $19,684,173 on behalf of the DNFSB. Neither the GSA accounting staff, nor the DNFSB's finance staff, has identified any improper payments during this period.

Federal Travel Card Program

The DNFSB 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 DNFSB'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 2006, 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 DNFSB 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

This DNFSB 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 2006, transactions using individual purchase cards totaled $326,223.

The DNFSB established a system of internal controls to ensure that only authorized purchases are made by each card holder. The DNFSB's purchase card procedures were distributed to all new purchase cardholders during FY 2006. These procedures stressed the requirement for completion of the electronic training program necessary to exercise the delegations of procurement authority.

The DNFSB'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 DNFSB contracting officer who gives final approval of invoices. The number of purchase cardholders is kept at the minimum necessary to effectively conduct DNFSB operations. At the close of FY 2006, the total number of purchase cards issued was 8 at headquarters, and 7 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 2004 the DNFSB contracted with the National Institute of Standards and Technology (NIST) to perform a review of the DNFSB's information technology security program. The results of NIST's review, along with the IT internal controls findings of the DNFSB's independent auditor, form the basis of the DNFSB's annual FISMA report to OMB, and associated Plans of Action & Milestones (POA&M). In FY 2006, the DNFSB has continued to submit all required FISMA reports and updates to OMB.

The prior-year findings of our independent auditor highlighted the need for improvements in the policies and procedures of the DNFSB's IT security program. That led to the creation and publication of **DNFSB AP 411.2, *Information Systems Security Program*** in FY 2005. This document, which establishes agency-wide roles and responsibilities for IT security, created a framework for the establishment of additional policies and procedures that will allow the DNFSB to systematically address other areas within its IT security programs that have been identified as needing improvement. Accomplishments in FY 2006 include the completion of standardized rules of behavior for all users of its General Support System and testing of the Continuity of Operations Plan.

Government Accountability Office (GAO) Investigations and Reports

Audit followup 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 2006, the GAO did not conduct any reviews or investigations of DNFSB oversight programs, and there are no open audit recommendations from previous GAO reviews.

Chapter 2
Program Performance

Overall Outcome: Using its expert knowledge, the DNFSB 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 2006. In a few cases noted in the report, additional safety improvements sought by the DNFSB have not yet been fully achieved by DOE. The DNFSB is actively pursuing these safety improvements in FY 2007.

INTRODUCTION

The DNFSB's contribution to the safety of DOE's defense nuclear activities derives from four basic types of activities. First, the DNFSB 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 DNFSB, to emphasize reviews of this type. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB's oversight in this area. The DNFSB 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 DNFSB cannot always predict in advance what activities it will review or what safety outcomes it will ultimately achieve.

Third, the DNFSB provides expert-level reviews of the safety implications of DOE's actions, decisions, and analyses. It is extremely important that the DNFSB 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 DNFSB attempts to be proactive in conducting these types 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 DNFSB to plan its efforts in this important area explicitly in advance. The DNFSB 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 DNFSB 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 DNFSB's efforts, this may be the area in which the DNFSB 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 DNFSB and its staff. The DNFSB's ability to identify previously unknown safety issues is constrained by the DNFSB's limited resources.

The DNFSB uses its Strategic Plan and Annual Performance Plan to ensure that its limited resources remain focused on the most significant safety challenges and the DOE activities that warrant the most external review. All of the DNFSB's safety activities are closely tied to goals and objectives embodied in these plans. This approach gives the DNFSB confidence that its small staff (fewer than 100 FTEs, including five full-time Board Members) and budget (approximately $21.8 million in FY 2006) are dedicated to the highest-risk activities under the DNFSB's jurisdiction. The DNFSB's strategic plan may be viewed in its entirety on the DNFSB's internet website at *www.dnfsb.gov*.

The information in this *Performance and Accountability Report* (PAR) is also provided directly to the Congress in the DNFSB's statutorily required annual report, also available on the DNFSB's website. There are slight differences between the two reports because the annual report covers calendar years rather than fiscal years. The DNFSB's *Seventeenth Annual Report to Congress* will be issued during the first quarter of CY 2007. The DNFSB's annual reports and performance reports are drafted by Federal employees of the DNFSB with only administrative assistance from contractors.

SAFETY GOALS

The DNFSB 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 DNFSB's strategic plan. The changes to the plan are evolutionary in nature and primarily result in increased DNFSB 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 DNFSB 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 DNFSB 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 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 develops, maintains, and implements regulations, requirements, and guidance; and establishes and implements safety programs at defense nuclear facilities as necessary to ensure adequate protection of health and safety of the workers and the public.

ANNUAL PERFORMANCE OBJECTIVES

The DNFSB's *Annual Performance Plan for FY 2006* identified annual performance objectives that consist of reviews that were to be conducted in support of the DNFSB'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 DNFSB's PAR.

The DNFSB 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 DNFSB communicates the results of its technical reviews;
- The DOE's subsequent development of appropriate corrective actions to resolve the DNFSB-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, DNFSB correspondence, staff reports, DOE and contractor public testimony, and other sources. Past reporting (see the DNFSB's annual reports) of DNFSB-identified issues and associated DOE responses demonstrates that the DNFSB has had a clear and positive impact on the safety of DOE defense nuclear activities.

Evaluation of the *Fiscal Year 2007 Performance Plan*

No changes to the *FY 2007 Performance Plan* have been identified based on a review of actual results achieved in FY 2006.

Assessment of the Reliability and Completeness of Performance Data

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

The DNFSB did not conduct an independent program evaluation in FY 2006.

Comparison of Fiscal Year 2006 Actual Performance with Planned Performance

The following pages provide detailed information comparing the DNFSB's actual performance driving safety improvements at DOE to its plans for FY 2006.

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 DNFSB. Follow-up technical evaluation of DOE's nuclear stockpile activities will verify necessary improvements in safety.

FY 2006 Performance Objectives:

The DNFSB's 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 DNFSB's staff will conduct assessments of DOE's efforts to develop and implement safety management systems for stockpile management activities. The DNFSB'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 aspects of safety management systems. These reviews will focus on activities at the Pantex Plant, Y-12 National Security Complex, SRS tritium facilities, Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and Sandia National Laboratories (SNL), as well as the Nevada Test Site (NTS).

Representative areas for DNFSB's staff review include:

- Development and implementation of site-wide and facility-specific safety analyses and controls for nuclear facilities and activities (e.g., safety analysis reports developed in response to 10 CFR 830).
- Annual updates of documented safety analyses developed in response to 10 CFR 830.
- Weapon-specific safety analyses and controls identification and implementation for nuclear weapon activities (the W76, B53, B61, W80 and the W84).
- Nuclear explosive operations at Pantex (e.g., the B83, special purpose facilities, and onsite transportation).
- Cross-cutting functional areas at the Pantex Plant, Y-12 National Security Complex, or SRS tritium facilities (legacy material disposition, nuclear criticality safety, fire protection, nuclear explosive safety).
- Special studies of unique or significant hazards at DOE nuclear facilities (e.g., classified projects, process technology alternatives such as the Saltless Direct Oxide Reduction [SDOR] and microwave casting).
- Ongoing start-up of enriched uranium operations, hydrogen fluoride systems, and other similar processing activities at the Y-12 National Security Complex.
- Work-planning process (e.g., activity-specific hazard analysis, controls identification, and implementation of safety controls).
- Plutonium pit manufacturing and certification at LANL.
- Preparations to dispose of damaged nuclear weapons or improvised nuclear devices at NTS.
- DOE/contractor operational readiness reviews or other readiness determinations.
- Age-related changes in nuclear weapons components for weapon systems in the enduring stockpile.

- Preparations for storage of Tritium Producing Burnable Absorber Rods at SRS.
- Compliance with the review process for facility and procedure changes that could impact nuclear safety at the Y-12 National Security Complex, the Pantex Plant, and SRS.

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 at the Pantex Plant or Y-12 National Security Complex that start in FY 2006.

FY 2006 Measured Performance:

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 DNFSB 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 DNFSB participated in this effort, and DOE briefed the DNFSB 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 DNFSB'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, key details regarding weapon response development have been left for the design laboratories to define. This issue will be the subject of DNFSB reviews in FY 2007.

Pantex Cell Gap Analysis. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB evaluated process development and execution of the W56 dismantlement campaign at Pantex. The DNFSB 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 DNFSB 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 DNFSB continued to evaluate DOE's plans to dismantle an older weapon system that does not incorporate some of the modern safety concepts. The DNFSB 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 DNFSB 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 followup review in FY06, the DNFSB 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 DNFSB expects to see continued improvements in the formality of nuclear explosive operations. The DNFSB is continuing to evaluate improvements in the formality of work through daily operational oversight provided by its site representatives.

Pantex Multi-Unit Operations. The DNFSB 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 DNFSB'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 DNFSB 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 DNFSB 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 DNFSB has now closed this recommendation.

Readiness to Dispose of a Damaged Nuclear Weapon. The DNFSB 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 DNFSB determined that DOE no longer had a clear plan for meeting this need. The DNFSB 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 DNFSB's interactions, DOE has continued to make physical and procedural improvements at the NTS G-tunnel, provided training, and has articulated its basic plans for dispositioning a damaged nuclear weapon, if needed.

Subcritical Experiments. The DNFSB reviewed preparations for subcritical experiments at NTS, identifying inadequate nuclear safety management programs, inadequate mechanisms for verification of readiness that would also be needed should nuclear weapons testing be resumed, and safety basis inadequacies for subcritical experiments that also would be relevant to nuclear weapons testing. 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 DNFSB 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 DNFSB evaluated the implementation of the safety basis for the Device Assembly Facility (DAF) and the conduct of readiness reviews. As a result, DOE developed and implemented 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB, 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 DNFSB's Recommendation 2004-2, *Active Confinement Systems*, this facility is now being assessed as a high priority facility with an accelerated schedule. The DNFSB 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 DNFSB 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 DNFSB evaluated the execution of this improvement plan in late FY06 and found that adequate progress was not being made. The DNFSB issued a reporting requirement in September 2006, requesting that DOE identify interim compensatory measures and articulate its plan for ensuring timely correction of the deficiencies.

Fire Protection at LANL. On May 15, 2006, the DNFSB received DOE's response to issues previously identified by the DNFSB 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 DNFSB reviewed this plan and determined the contractor's proposed activities adequately addressed the DNFSB'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 DNFSB reviewed LANL's requirements for designing research and development processes and apparatus. The DNFSB 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 DNFSB 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 DNFSB's staff.

Integrated Safety Management at Sandia National Laboratories, New Mexico. In an October 8, 2004 letter, the DNFSB 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 DNFSB 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 DNFSB'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 DNFSB 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 DNFSB 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 DNFSB'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 DNFSB 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 DNFSB 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 DNFSB have been completed.

LLNL Plutonium Facility Safety Basis. The DNFSB reviewed the revised Documented Safety Analysis (DSA) for the LLNL Plutonium Facility and determined that it adequately addressed deficiencies identified in the DNFSB's letter of April 12, 2004. The DNFSB was particularly pleased that LLNL has renewed its commitment to a control strategy that includes robust, safety-class active confinement ventilation. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB. In April 2006, the DNFSB 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 DNFSB evaluated the draft and final Requests for Proposal (RFP) for the LLNL management and operating contract issued by DOE during FY06. The DNFSB 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 DNFSB 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. The DNFSB 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 DNFSB 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 DNFSB. The DNFSB 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 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 DNFSB. 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 DNFSB to stabilize and dispose of hazardous nuclear materials.

FY 2006 Performance Objectives:

The DNFSB 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 plutonium metal and oxide at the Savannah River Site (SRS) and Los Alamos National Laboratory (LANL) (Recommendation 94-1/2000-1), including followup on findings and recommendations from the study of the adequacy of plutonium storage at SRS as required by Public Law 107-314, Section 3183, *Study of Facilities for Storage of Plutonium Materials at Savannah River Site*.
- Stabilization and disposal of plutonium-bearing residues at LANL (Recommendation 94-1/2000-1).
- Design of modifications to existing SRS facilities to increase long-term plutonium storage capacity and provide long-term restabilization/repackaging capability.
- Design of modifications to existing SRS facilities to support potential plutonium disposition activities.
- Monitoring and surveillance activities in support of long-term storage of plutonium.
- Neptunium solution stabilization operations at the SRS (Recommendation 94-1/2000-1).
- Complex-wide legacy nuclear material issues, including evaluation of materials not addressed by Recommendations 94-1 and 2000-1 and utilization of stabilization capabilities..
- Design of treatment facilities for high-level waste liquids and salts at the SRS, and system improvements to ensure safe management of the SRS high-level waste (Recommendation 2001-1).
- Maintaining high-level waste storage tank structural and lead integrity at SRS and the Hanford Site and application of the results of DOE's corrosion testing program to corrosion chemistry controls.
- Operation of high-level waste retrieval and transfer systems at additional tank farms at Hanford.
- Conduct of operations and work planning at the Hanford tank farms.
- Safety of supplemental processing and treatment of waste from Hanford tank farms.
- Continued safe operation of the Melton Valley transuranic/alpha waste treatment facility at Oak Ridge National Laboratory (ORNL).
- Safety of spent nuclear fuel basin sludge retrieval, treatment, and storage at the Hanford Site (Recommendation 94-1/2000-1).

- Safety of ongoing contact-handled transuranic waste operations and safe startup of anticipated remote-handled transuranic waste operations at the Waste Isolation Pilot Plan (WIPP).
- Safety of processing and packaging of cesium and strontium capsules for dry storage at the Hanford Site.
- Design of ORNL's system for processing ^{233}U (i.e., ^{229}Th extraction) for potential medical applications.
- Safety of the retrieval, characterization, and packaging of cesium and strontium capsules at the Hanford burial grounds.
- Final closure activities at Rocky Flats Environmental Technology Site (RFETS).
- SRS deactivation activities, including F-Canyon and the Naval Fuels Fabrication Facility.
- Idaho National Engineering and Environmental Laboratory decommissioning activities.
- Hanford Site decommissioning activities (e.g., monitoring of decommissioning work at the Plutonium Finishing Plant and the K-Basins).
- Final closure activities at the Miamisburg Closure Project.
- Final closure activities at the Fernald Closure Project.

FY 2006 Measured Performance:

Hanford Sludge Retrieval and Disposition Project. The DNFSB 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 DNFSB 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 DNFSB letter regarding corrosion in the vapor space of HLW tanks, DOE sponsored an expert panel at Hanford during 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 DNFSB 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 reduced funding, decommissioning activities at PFP have slowed, and the date for completing decommissioning has been extended from 2009 to 2016. The DNFSB continues to evaluate the transition of PFP from a near-term decommissioning mission to an extended layup period. Through a number of walk downs of the PFP facilities, the DNFSB 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 layup period.

Soil Remediation at Hanford. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB has recently noted improvements in the safety of these operations.

Waste Drums Containing Plutonium-238 at Hanford. Since 2002, the DNFSB has noted the potential hazards associated with the retrieval, handling, and disposition of 12 drum containing plutonium oxides with a 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 DNFSB 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 & Fuels Complex at the INL have received and stored neptunium oxide materials shipped from SRS. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB observations, additional validation of the hydrogen explosion model was performed to ensure it could generate accurate predictions for DWPF piping configurations. Furthermore, to address DNFSB 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 DNFSB 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 DNFSB'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 DNFSB 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 DNFSB is continuing to provide extensive oversight of site office corrective actions to ensure they have the desired effect.

Conduct of Operations at SRS. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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.

Adequacy of Plutonium Storage at Savannah Site. The DNFSB issued its *Third Annual Report to Congress, Plutonium Storage at DOE's Savannah river Site.* Most of the actions required to improve storage conditions at the site have been competed. Upgrades to the fire protection system in the K-Area Materials Storage Facility are currently under way.

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 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 DNFSB. 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 2006 Performance Objectives:

The DNFSB and its staff will continue its reviews of DOE's implementation of integrated safety management (ISM) in design and construction activities. At least five reviews will be completed. In general, the reviews will evaluate the adequacy of geotechnical specifications and hazard analysis; 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. Also, begin reviewing plans for Waste Treatment Plant testing and commissioning.
- Continue design and construction reviews of the Highly Enriched Uranium Materials Facility at the Y-12 National Security Complex.
- Review modifications to existing Savannah River Site (SRS) processing facilities to support plutonium disposition activities.
- Review modifications to existing SRS facilities to increase long-term plutonium storage capacity and provide long-term restabilization/repackaging capability. (Public Law 107-314, Section 3183).
- Evaluate the construction of the Pit Disassembly and Conversion Facility at SRS.
- Review the design of the Chemical and Metallurgical Research Facility replacement at the Los Alamos National Laboratory.
- Review the construction of a treatment facility for high-level waste liquids and salts at SRS, and systems improvements to ensure safe management of SRS high-level waste (Recommendation 2001-1).

As a result of these reviews, DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the DNFSB. 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 2006 Measured Performance:

The DNFSB staff continued providing technical evaluations of numerous design and construction projects through out the DOE complex. These evaluations have led to DOE improving their 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 DNFSB during the past several years, it became apparent to the DNFSB that safety was not being integrated into the design of new facilities early in the design process. The DNFSB 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 provide more detailed guidance for project management. Further, DOE is developing a new standard to implement a more rigorous approach to safety-in-design. The DNFSB 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 DNFSB 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 DNFSB'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 DNFSB 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 DNFSB 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 DNFSB, 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 DNFSB 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 DNFSB 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 DNFSB 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 fiscal year 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB.

Device Assembly Facility at the Nevada Test Site. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB continued to review the safety of the design of the Pit Disassembly and Conversion Facility (PDCF). The DNFSB 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 DNFSB found that although the final predicted surface settlement is deemed adequate, the methods used need to be improved. The DNFSB will address this concern with SRS separately. The DNFSB also suggested several improvements in the electrical design of PDCF. The DNFSB 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 DNFSB'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 DNFSB continues to review the new enhanced design as well as site geotechnical investigations.

Highly Enriched Uranium Manufacturing Facility. The DNFSB 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 4: NUCLEAR PROGRAMS AND ANALYSIS

DOE develops, maintains, and implements regulations, requirements, and guidance; and establishes and implements safety programs at defense nuclear facilities as necessary to ensure 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 DNFSB. 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.

FY 2006 Performance Objectives:

The DNFSB 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 DNFSB will be provided to DOE for action. The DNFSB 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 DNFSB and staff interaction to ensure satisfactory resolution of potential issues. In those rare cases in which new directives are determinated to be required, the DNFSB will work with DOE to ensure that the applicable documents are developed adequately. The DNFSB 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 25 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 DNFSB 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.
- Activity-level ISM for non-10 CFR 830 activities.
- Validation of at least one site office review of activity-level ISM.
- Validation of at least one ISM review by the DOE Office of Oversight.
- Implementation of line oversight of ISM per DOE P 450.5 at one EM site and one NNSA site.
- Implementation or Recommendation 2000-2, *Configuration Management, Vital Safety Systems*.
- Implementation and effectiveness of ISM at defense nuclear facilities.

The DNFSB 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, readiness preparations, hoisting and rigging. 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 DNFSB will complete its initiative to identify the potential issues associated with DOE's and NNSA's new policies on line oversight and contractor assurance and ensure DOE and NNSA senior management address these issues before implementing the new policies. The DNFSB anticipates that this effort to complete the implementation plan associated with Recommendation 2004-1, *Oversight of Complex, High Hazard Nuclear Operations*, will have required significant DNFSB and staff interaction with multiple federal and contractor agencies.

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

FY 2006 Measured Performance:

DOE Directives. As part of its ongoing review of new and revised DOE directives, the DNFSB 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 Operations*
- DOE Standard 1104, *Review and Approval of Nuclear Facility Safety Basis Documents*

Recommendation 2004-2. The DNFSB 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 benefitting 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 DNFSB'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 DNFSB 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. In 2006, DOE performed a review of the Recommendation 2004-1 Implementation Plan commitments. Based on the results of the reviews and experience with implementation to date, DOE developed a revision to the implementation plan that is still responsive to the recommendation. Implementation activity will continue beyond FY 2007.

Administrative Controls. In Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*, the DNFSB 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 DNFSB'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 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 DNFSB 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 DNFSB continues to follow DOE's activities associated with the use of quantitative risk assessment at defense nuclear facilities. Previously, the DNFSB 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 DNFSB'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 DNFSB'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 DNFSB 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 DNFSB regarding the lack of Nuclear Criticality Safety (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 DNFSB 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. By the end of 2006, DOE had provided their response, which the DNFSB found acceptable.

Implementation of ISM: Activity-Level Work Planning. In 2006, the National Nuclear Security Administration completed work on their 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 DNFSB 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.

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

CFO LETTER

I am pleased to report that DNFSB's FY 2006 financial statements received an unqualified opinion from its independent auditors, its first unqualified opinion since its FY2004 financial statements were initially audited pursuant to the Accountability and Tax Dollars Act (ATDA) of 2002. The financial statements that follow were prepared and audited as part of this performance and accountability report 45 days after the end of the fiscal year, another first time accomplishment. 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's Heartland Finance Center to act as its accounting services provider. The DNFSB's financial staff worked diligently with our GSA accountants in preparing our FY 2006 financial statements and providing the necessary supporting documentation to our auditors, and credit should be given to both those organizations for achieving these first time accomplishments.

Although more work needs to be done in documenting our compliance with the Federal Managers Financial Integrity Act (FMFIA) and addressing internal control weakness, as detailed below the DNFSB's staff has also made great strides in correcting previously reported internal control problems.

Compliance with Laws and Regulations

The auditors tested the DNFSB'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 06-03, *Audit Requirements for Federal Financial Statements*. The auditors found no instances of non-compliance with such laws or regulations exclusive of FMFIA. The auditors found that DNFSB did not have procedures requiring documentation to support its annual FMFIA assessments. Without this documentation the auditors were unable them to issue an opinion on DNFSB's compliance with FMFIA. DNFSB agrees that additional documentation is needed and at the time of this report was in the final stages of drafting policy guidance. However, it should be noted that 20 of the DNFSB's 100 FTEs are dedicated to managing and providing the full range of administrative support services (i.e., human resources, acquisition, budgeting and finance, information technology, security, etc.) and thus the level of documentation must be balanced with its limited resources. It is anticipated that the implementation of this guidance will correct this non-compliance in FY 2007.

The auditors' FY 2005 report found that the DNFSB was non-compliant with the Federal Financial Management Improvement Act (FFMIA). OMB Bulletin 06-03 clarified that agencies such as DNFSB that are subject to ATDA are not subject to the requirements of FFMIA, and thus this non-compliance was "corrected."

Internal Controls

In planning and performing the financial statements audit, the independent auditors considered the DNFSB'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. Internal controls testing was limited to those controls necessary to achieve objectives described in OMB Bulletin 06-03. The auditors found one reportable condition that did not rise to the level of a material weakness which was also a prior-year finding. The auditor noted that while the DNFSB had made some progress in addressing known information technology weaknesses, such as testing of a Continuity of Operations plan, there are several significant weaknesses in the DNFSB's management of information systems which together constitute a reportable condition. The DNFSB is aware of this shortcoming in our IT operations, and is working to develop the necessary analyses and written policies while maintaining its excellent delivery of timely and reliable IT services to the DNFSB and outside customers. Operating with a limited IT budget, the DNFSB will need to request additional resources to expedite the preparation and review of the needed documentation. The specific weaknesses and the DNFSB's response are included in the auditors report.

In general, the DNFSB 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 DNFSB, and are the result of a lack of written policies and procedures to guide ongoing information technology operations. As a small agency with limited resources, the DNFSB has focused its resources on providing reliable IT support operations, and recognizes that the preparation of assessments and procedures has not received priority attention. The DNFSB will make a reasonable and cost-effective effort in FY 2007 to correct the internal control weaknesses that present the highest potential impact to our IT resources.

In the FY 2005 audit report, the auditor cited two other matters involving internal controls they considered to be reportable conditions and material weaknesses. They involved: (1) lack of financial reporting procedures to document the responsibilities and actions necessary for DNFSB and GSA to prepare financial statements that meet all required laws and regulations, and (2) a lack of DNFSB "ownership" in providing oversight of GSA in the preparation of the financial statements. DNFSB financial staff worked diligently to address these weaknesses and the FY 2006 audit reported that the DNFSB had resolved these material weaknesses before the preparation of our FY 2006 financial statements. The DNFSB's efforts to successfully resolve these weaknesses are directly related to achieving its unqualified opinion on its statements.

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 accompanying Balance Sheets of the Defense Nuclear Facilities Safety Board (DNFSB) as of September 30, 2006, and 2005, and the related Statements of Net Cost, Changes in Net Position, Budgetary Resources, and Financing for the years then ended. DNFSB management is responsible for preparing these financial statements in conformity with accounting principles generally accepted in the United States of America. Our responsibility is to express an opinion on the financial statements based on our audits.

Except as discussed in the following paragraph, we conducted our audits in accordance with *Government Auditing Standards,* auditing standards generally accepted in the United States of America, and OMB Bulletin 06-03, *Audit Requirements for Federal Financial Statements*. These standards require that we plan and perform audits to obtain reasonable assurance about whether financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the 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.

Beginning balances for FY 2005 were not audited. Thus, the scope of our work was not sufficient to enable us to express, and we do not express, an opinion on the Statements of Net Cost, Changes in Net Position, Budgetary Resources, and Financing for the year ended September 30, 2005.

In our opinion, the Balance Sheets as of September 30, 2006, and 2005, and the related Statements of Net Cost, Changes in Net Position, Budgetary Resources, and Financing for the year ended September 30, 2006, present fairly, in all material respects, the financial position of DNFSB as of and for the indicated dates, 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, 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 the information with the financial statements. We did not audit the MD&A or the other accompanying information and therefore express no opinion on them.

In accordance with *Government Auditing Standards*, we issued separate reports dated November 2, 2006, on DNFSB's internal control and compliance with laws and regulations. Our reports on internal control and compliance are an integral part of an audit conducted in accordance with *Government Auditing Standards* and, in considering audit results, these reports should be read together with this report.

COTTON & COMPANY LLP

Colette Y. Wilson, CPA
Partner

November 2, 2006
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, 2006, and 2005, and the related Statements of Net Cost, Changes in Net Position, Budgetary Resources, and Financing for the years then ended. We have issued our report thereon dated November 2, 2006. We conducted our audits in accordance with generally accepted auditing standards; 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 06-03, *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 the agency's financial statements are free of material misstatement, we performed tests of DNFSB's 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 06-03. We limited our tests of compliance to these provisions, and we did not test compliance with all laws and regulations applicable to DNFSB.

The results of our tests of compliance disclosed one instance of noncompliance. DNFSB did not evaluate and report on internal control and financial systems that protect the integrity of its programs and thus did not comply with certain provisions the Federal Managers' Financial Integrity Act (FMFIA).

Federal Managers' Financial Integrity Act

DNFSB did not have procedures requiring documentation of assessments of the effectiveness and efficiency of operations, reliability of financial reporting, and compliance with applicable laws and regulations. Documented assessments would serve to support the agency's annual report on internal control and financial systems, as required by FMFIA.

Recommendation

We recommend that DNFSB establish procedures to document compliance with applicable sections of FMFIA.

Management Response

DNFSB agrees with the recommendation. At the time of the audit report, DNFSB is already well underway in developing procedures to document its compliance with FMFIA and anticipates finalizing and implementing these procedures no later than the second quarter of FY 2007.

Providing an opinion on compliance with certain provisions of laws and regulations was not an objective of our audit and, accordingly, we do not express such an opinion.

This report is intended solely for the information and use of DNFSB management, 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, 2006
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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, 2006, and 2005; and the related Statements of Net Cost, Changes in Net Position, Budgetary Resources, and Financing for the years then ended. We have issued our report thereon dated November 2, 2006. We conducted our audits in accordance with generally accepted auditing standards; 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 06-03, *Audit Requirements for Federal Financial Statements*.

In planning and performing our audits, we considered DNFSB's internal control over financial reporting by obtaining an understanding of the agency's internal control, determining if internal control had been placed in operation, assessing control risk, and performing tests of controls to determine auditing procedures for the purpose of expressing our opinion on the financial statements. We limited internal control testing to those controls necessary to achieve objectives described in OMB Bulletin 06-03. We did not test all internal control relevant to operating objectives as broadly defined by the Federal Managers' Financial Integrity Act of 1982, such as those controls relevant to ensuring efficient operations. The objective of our audits was not to provide assurance on internal control. Consequently, we do not provide an opinion on internal control.

Our consideration of internal control over financial reporting would not necessarily disclose all matters in internal control over financial reporting that might be reportable conditions. Under standards issued by the American Institute of Certified Public Accountants, reportable conditions are matters coming to our attention relating to significant deficiencies in the design or operation of internal control that, in our judgment, could adversely affect an agency's ability to record, process, summarize, and report financial data consistent with management assertions in the financial statements. Material weaknesses are reportable conditions in which the design or operation of one or more of the internal control components does not reduce to a relatively low level the risk that misstatements in amounts that would be material in relation to the financial statement being audited may occur and not be detected within a timely period by employees in the normal course of performing their assigned functions. Because of inherent limitations in internal control, misstatements, losses, or noncompliance may nevertheless occur and may not be detected.

We noted one matter involving internal control and its operation that we considered to be a reportable condition. This reportable condition involves internal control over information systems.

DNFSB's internal control over information systems was inadequate. During Fiscal Year (FY) 2006, DNFSB made some progress in addressing known information system weaknesses, such as testing its Continuity of Operations Plan (COOP). As the result of our audit in accordance with the *Federal Information System Controls Audit Manual* (FISCAM), we identified significant weaknesses in DNFSB management of information systems. The most significant of these are described below.

OVERSIGHT OF OUTSOURCED INFORMATION SYSTEMS

DNFSB did not ensure that third-party service provider controls were adequate and did not implement customer consideration controls described in the SAS 70 reports for its major financial systems, Pegasys and WebTA. In addition, DNFSB did not document procedures for protecting financial data provided to outside entities, including the General Services Administration (GSA) and Bureau of the Public Debt (BPD).

Recommendations

We recommend that DNFSB improve oversight of outsourced information systems by:

- Implementing procedures to ensure that internal control at third-party service providers is adequate and complete.
- Ensuring that required security controls at GSA and BPD are documented and agreed upon by both parties before sharing financial data with outside entities.

Management Response

Management agrees with the recommendations. Management's full response is in the appendix.

CERTIFICATIONS AND ACCREDITATIONS FOR MAJOR INFORMATION SYSTEMS

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

- Subject these systems to certification and accreditation (C&A) processes.
- Ensure that systems were authorized or accredited by the managers whose mission they support.
- Perform and document risk assessments.

In addition, DNFSB did not document 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 Rev. 1, *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. Twenty-four of thirty-two recommendations listed in the Plan of Action and Milestones (POA&M) report remained open.

As a result of these conditions, management increases the risk that sensitive data are not adequately protected at all times.

Recommendations

We recommend that DNFSB improve 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:

- All general support systems and major applications undergo the C&A process every 3 years or as major changes occur.
- 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.
- System security plans are documented and maintained for each system in accordance with NIST SP 800-18.
- Maintain a list of known system vulnerabilities in system POA&Ms and initiate prompt corrective action.

Management Response

Management agrees with the recommendations. Management's full response is in the appendix.

STATUS OF PRIOR-YEAR INTERNAL CONTROL WEAKNESSES

In our FY 2005 report on internal control, we described two matters considered to be material weaknesses and one to be a reportable condition. The material weaknesses involved financial reporting procedures and ownership of financial statements. The reportable condition involved internal control over information systems.

DNFSB resolved the material weaknesses relating to financial reporting procedures and ownership of the statements before it prepared its FY 2006 financial statements. While progress was made in addressing some information system deficiencies, the main issues remain, as discussed in the previous section. The information system issues continue to be a reportable condition.

With respect to internal control related to significant performance measures included in Management's Discussion and Analysis, DNFSB reported no quantitative performance measures. Accordingly, we could not obtain an understanding of the design of internal control relating to existence and completeness assertions, as required by OMB Bulletin 06-03.

This report is intended solely for the information and use of DNFSB management, 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, 2006
Alexandria, Virginia

APPENDIX

MANAGEMENT RESPONSE TO FY 2006
INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL

MANAGEMENT RESPONSE TO FY 2006
INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL

A. Oversight of Outsourced Information Systems

DNFSB agrees with the independent auditor's findings that additional steps can be taken to improve the oversight of outsourced information systems, and DNFSB has already begun to take actions that will give DNFSB greater assurances that its information is being adequately protected when it resides in external information systems.

In addition to obtaining and reviewing SAS-70 reports for its outsourced information systems (the Pegasys system owned and operated by GSA and the WebTA system owned and operated by the Bureau of Public Debt (BPD)), in FY06 DNFSB also verified that both the Pegasys and WebTA systems were categorized according to FIPS-199, were certified and accredited (C&A) by their system owners, had security controls tested in FY 2006, and had tested contingency plans. These additional steps have provided an increased level of confidence that the controls put in place by DNFSB's outsourced information systems are sufficient to protect DNFSB's information.

Another action that has been taken is to clarify and strengthen the contractual agreements with DNFSB's outsourced information systems service providers. DNFSB included language in its FY07 agreements with GSA and BPD that requires they provide all necessary documentation (e.g., Certification and Accreditation documentation) for DNFSB to meet its Federal Information Security Management Act (FISMA) obligations, and to provide timely notification to DNFSB when any Personally Identifiable Information is suspected or known to have been compromised. Since both of DNFSB's outsourced service providers are also Federal agencies, DNFSB hopes to leverage the FISMA documentation, including proof of certification and accreditation of systems as well as results of contingency plan testing, of the outsourced information systems to provide a greater level of assurance that DNFSB's information is adequately protected.

Finally, once DNFSB implements its own internal certification and accreditation process, DNFSB intends to certify and accredit its external (i.e. outsourced) information systems in addition to DNFSB's internal information systems. DNFSB has set a stated goal of implementing an effective certification and accreditation (C&A) process in FY 2007.

B. Certifications and Accreditations for Major Information Systems

DNFSB agrees with the independent auditor's findings that one of the most significant weaknesses in the implementation of DNFSB's Information Systems Security Program (ISSP) is the lack of a formal certification and accreditation (C&A) process. Because of DNFSB's limited resources, weaknesses must be prioritized, and DNFSB recognizes that correcting this weakness is the biggest single action DNFSB can take to improve its internal controls. Therefore, correcting this weakness has become a stated priority in FY 2007.

DNFSB agrees that significant work is required to correct known deficiencies listed in DNFSB's Plan of Action and Milestones (POA&M) report, some of which were added within the past few months. Due to limited resources and time, DNFSB has had to prioritize its efforts in this regard. Eight recommendations were corrected, bringing the current uncorrected number to 24. By developing and implementing a formal C&A process, DNFSB will be able to address at least 14 of the 24 remaining recommendations, which will significantly enhance the posture of DNFSB's Information Systems Security Program. As noted above, DNFSB intends to implement its C&A process in FY 2007.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

APPROPRIATED FUND

FINANCIAL STATEMENTS

As Of and For The Years Ended September 30, 2006 and 2005

DEFENSE NUCLEAR FACILITY SAFETY BOARD

BALANCE SHEET

As Of September 30, 2006 and 2005

		2006	2005
Assets:			
Intragovernmental:			
Fund Balance With Treasury	(Note 2)	$ 8,479,577	$ 6,352,070
Total Intragovernmental		8,479,577	6,352,070
Accounts Receivable, net	(Note 3)	86,828	9,450
General Property, Plant and Equipment	(Note 4)	164,975	154,684
Other	(Note 5)		11,100
Total Assets		$ 8,731,380	$ 6,527,304
Liabilities:	(Note 6)		
Intragovernmental:	(Note 7)		
Accounts Payable		$ 24,827	$ 10,501
Employee Benefits	(Note 8)	$ 133,401	119,738
Total Intragovernmental		158,228	130,239
Accounts Payable		570,836	206,759
Other	(Note 9)		
Accrued Funded Payroll and Leave		533,606	498,908
Unfunded Leave		830,076	830,320
Worker's Compensation	(Note 10)	5,376	2,213
Total Liabilities		2,098,122	1,668,439
Net Position:			
Unexpended Appropriations - Other Funds		8,057,072	6,370,439
Cumulative Results of Operations - Other Funds		(1,423,814)	(1,511,574)
Total Net Position		6,633,258	4,858,864
Total Liabilities and Net Position		$ 8,731,380	$ 6,527,304

*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, 2006 and 2005

		2006	2005
Program Costs:			
DNFSB:			
Gross Costs	(Note 12)	$ 20,618,579	$ 20,076,655
Less: Earned Revenue			
Net Program Costs		20,618,579	20,076,655
Net Cost of Operations		$ 20,618,579	$ 20,076,655

*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, 2006 and 2005

	2006 Earmarked Funds	2006 All Other Funds	2006 Eliminations	2006 Consolidated Total	2005 Consolidated Total
Cumulative Results of Operations:					
Beginning Balances	$	$ (1,511,574)	$	$ (1,511,574)	$ (611,065)
Adjustments:					
(b) Corrections of Errors (+/-)					(1,307,403)
Beginning Balances, as Adjusted	$	$ (1,511,574)	$	$ (1,511,574)	$ (1,918,467)
Budgetary Financing Sources:					
Appropriations Used		20,125,047		20,125,047	19,776,144
Other		4,286			
Other Financing Resources (Non-Exchange):					
Imputed Financing		577,006		577,006	707,404
Total Financing Sources		20,706,339		20,702,053	20,483,548
Net Cost of Operations (+/-)		20,618,579		20,618,579	20,076,655
Net Change		87,760		83,474	406,893
Cumulative Results of Operations	$	$ (1,423,814)	$	$ (1,428,100)	$ (1,511,574)
(b) All Other Funds					
Unexpended Appropriations:					
Beginning Balances	$	$ 6,370,439	$	$ 6,370,439	$ 4,733,324
Adjustments:					
(b) Corrections of Errors (+/-)					1,307,403
Beginning Balances, as Adjusted	$	$ 6,370,439	$	$ 6,370,439	$ 6,040,727
Budgetary Financing Sources:					
Appropriations Received		22,032,000		22,032,000	20,268,000
Other Adjustments		(220,320)		(220,320)	(152,144)
Appropriations Used		(20,125,047)		(20,125,047)	(19,776,144)
Total Budgetary Financing Sources		1,686,633		1,686,633	329,712
Total Unexpended Appropriations		8,057,072		8,057,072	6,370,439
Net Position	$	$ 6,633,258	$	$ 6,628,972	$ 4,858,864

*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 The Years Ended September 30, 2006 and 2005

	2006 Budgetary	2006 Non-Budgetary Credit Program Financing Accounts	2005 Budgetary	2005 Non-Budgetary Credit Program Financing Accounts
Budgetary Resources:				
Unobligated Balance:				
Beginning of Period	$ 1,389,721	$	$ 962,550	$
Recoveries of Prior Year Obligations	683,709		366,543	
Budget Authority:				
Appropriations Received	22,032,000		20,268,000	
Earned				
Collected	3,704		5,728	
Subtotal	$ 22,035,704		$ 20,273,728	
Permanently Not Available	(220,320)		(162,144)	
Total Budgetary Resources	$ 23,688,813	$	$ 21,440,687	$
Status of Budgetary Resources:				
Obligations Incurred				
Direct	$ 20,445,071	$	$ 20,050,966	$
Subtotal	$ 20,445,071		$ 20,050,966	
Unobligated Balances				
Apportioned	2,754,942		1,017,450	
Subtotal	$ 2,754,942		$ 1,017,450	
Unobligated Balances - Not Available	488,801		372,271	
Total Status of Budgetary Resources	$ 23,688,813	$	$ 21,440,687	$
Change in Obligated Balances:				
Obligated Balance, Net:				
Unpaid Obligations, Brought Forward, October 1	$ 4,962,349	$	$ 4,967,251	$
Total, Unpaid Obligated Balance, Brought Forward, Net	$ 4,962,349		$ 4,967,251	
Obligations Incurred	20,445,071		20,050,966	
Gross Outlays (-)	(19,687,876)		(19,709,326)	
Recoveries of Prior-Year Unpaid Obligations, Actual (-)	(683,709)		(366,543)	
Obligated Balance, Net, End of Period:				
Unpaid Obligations (+) (Note 13)	6,035,834		4,962,349	
Total, Unpaid Obligated Balance, Net, End of Period	$ 6,035,834	$	$ 4,962,349	$
Net Outlays:				
Gross Outlays (+)	19,687,876		19,709,326	
Offsetting Collections (-)	(3,704)		(5,728)	
Net Outlays (Note 14)	$ 19,684,173	$	$ 19,703,598	$

*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 FINANCING

For The Years Ended September 30, 2006 and 2005

	2006	2005
Resources Used to Finance Activities:		
Budgetary Resources Obligated		
Obligations Incurred	$ 20,445,071	$ 20,050,966
Less: Spending Authority from Offsetting Collections and Recoveries	687,413	372,271
Obligations Net of Offsetting Collections and Recoveries	19,757,658	19,678,695
Net Obligations	19,757,658	19,678,695
Other Resources		
Imputed Financing from Costs Absorbed by Others	577,006	707,404
Net Other Resources Used to Finance Activities	577,006	707,404
Total Resources Used to Finance Activities	20,334,664	20,386,099
Resources Used to Finance Items not Part of the Net Cost of Operations		
Change in Budgetary Resources Obligated for Goods Services and Benefits Ordered But Not Yet Provided	(364,379)	353,779
Resources that Finance the Acquisition of Assets	175,924	36,998
Total Resources Used to Finance Items Not Part of the Net Cost of Operations	(188,455)	390,777
Total Resources Used to Finance the Net Cost of Operations	20,523,120	19,995,323
Components of the Net Cost of Operations that will not Require or Generate Resources in the Current Period: (Note 15)		
Components Requiring or Generating Resources in Future Periods:		
Increase in Annual Leave Liability	(244)	18,096
Other (+/-)	3,163	1,021
Total Components of Net Cost of Operations that will Require or Generate Resources in Future Periods	2,919	19,117
Components Not Requiring or Generating Resources:		
Depreciation and Amortization	88,254	62,216
Revaluation of Assets or Liabilities (+/-)	4,286	
Total Components of Net Cost of Operations that will not Require or Generate Resources	92,540	62,216
Total Components of Net Cost of Operations that will not Require or Generate Resources in the Current Period	95,459	81,333
Net Cost of Operations	$ 20,616,579	$ 20,076,655

*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 (DNFSB) 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 DNFSB is directed by a Chairman and four members appointed by the President. The DNFSB'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 Defense Nuclear Facilities Safety Board in accordance with generally accepted accounting principles 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, a Statement of Budgetary Resources and a Statement of Financing. The balance sheet presents, as of September 30, 2006, amounts of future economic benefits owned or managed by the Defense Nuclear Facilities Safety Board (assets), amounts owed by the Defense Nuclear Facilities Safety Board (liabilities), and amounts, which comprise the difference (net position). The Statement of Net Cost reports the full cost of the DNFSB's operations. The Statement of Budgetary Resources reports an agency's budgetary activity, while the Statement of Financing reconciles budgetary resources to the agency's net cost of operations.

(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 Defense Nuclear Facilities Safety Board receives its funding needed to support its programs through congressional appropriations. Appropriated funds are received annually and remain available until expended (e.g., no year funds).

An imputed financing source is recognized to offset costs incurred by the DNFSB 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 DNFSB and other Federal entities.

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

Liabilities represent amounts that are likely to be paid by the DNFSB 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 DNFSB 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 DNFSB's receipts and disbursements. Funds with the U.S. Treasury are cash balances from appropriations as of the fiscal year-end from which the DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB. The pension expense recognized in the financial statement equals the current service cost for the DNFSB's employees for the account period less the amount contributed by the employees. OPM, the administrator of the plan, supplies the DNFSB 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 DNFSB (see note 8).

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

Federal employee benefit costs paid by OPM and imputed to the DNFSB are reported as resources on the Statements of Changes in Net Position and Financing.

(j) Contingencies

The DNFSB 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 DNFSB's financial statements. Thus, there is no provision for such losses in its statements. The DNFSB has not entered into any contractual arrangements which may require future financial obligations.

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

The DNFSB's funds with the U.S. Treasury consist only of appropriated funds. Worksheet adjustments were made for credits of $75 and $26,937 for FY2006 and FY2005, 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, 2006 and 2005 are as follows:

A. Fund Balance with Treasury	2006	2005
Appropriated Fund	$8,479,577	$6,352,070

B. Status of Fund Balance with Treasury

1. Unobligated Balance		
(a) Available	2,754,942	1,017,450
(b) Unavailable	688,801	372,271
2. Obligated Balance not yet Disbursed	5,035,834	4,962,349
Total	$8,479,577	$6,352,070

Note 3 – Accounts Receivable, Net

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

Accounts Receivable	2006	2005
Claims	$86,828	$9,450

Note 4 - General Property, Plant and Equipment, Net

The DNFSB's total cost, accumulated depreciation, and net book value for PPE for the years ending September 30, 2006 and 2005 are as follows.

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

2005	Equipment	Furniture & Fixtures	Software	Total
Cost	$623,120	$52,644	$61,839	$737,603
Accum. Depr.	(533,955)	(31,651)	(17,313)	(582,919)
Net book value	$ 89,165	$20,993	$44,526	$154,684

* rounding

The DNFSB changed its capitalization policy (to that described under Note 1(g)) effective in FY 2006; the change in policy was not made retroactive to FY 2005 and prior capitalized items. The prior policy was to capitalize all items over $5,000 on a straight-line basis over a five year useful life (there was no separate policy for bulk purchase threshold). Had the policy been implemented in FY 2005 there would have been less than a $10,000 impact to the FY 2005 financial statements.

Note 5 – Other Assets

This line item represents Advances to DNFSB employees for relocation expenses. Amounts are recorded as advances until the employees account for their expenses.

	2006	2005
1. Intra-governmental	0	0
2. With the Public – Associates	$0	$11,100
Total Other Assets	$0	$11,100

Note 6 – Liabilities Not Covered by Budgetary Resources

The liabilities on the DNFSB's Balance Sheets as of September 30, 2006 and 2005 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, 2006 and 2005 is as follows:

	2006	2005
Unfunded Leave	$ 830,076	$ 830,320
Intra-governmental Workers' Compensation	$ 5,376	$ 2,213
Total liabilities not covered by budgetary resources	$ 835,452	$ 832,533
Total liabilities covered by budgetary resources	$1,262,670	$ 835,906
Total Liabilities	$2,098,122	$1,668,439

Note 7 - Intra-governmental Liabilities

Intra-governmental liabilities arise from transactions with other federal entities. All of the DNFSB's FY2005 accounts payable intra-governmental liabilities are with the General Services Administration (GSA); $12,601 of the DNFSB's FY2006 accounts payable intra-governmental liabilities are with GSA and the balance ($12,226) are with the General 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, 2006 and 2005 for FEHBP, FEGLIP, FICA, FERS, and CSRS contributions (reference Note 8).

Note 8 – Federal Employee Benefits

All permanent employees participate in the contributory Civil Service Retirement System (CSRS) or the Federal Employees Retirement System (FERS). FERS employees are covered under the Federal Insurance Contributions Act (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 DNFSB's financial statements. The DNFSB 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 Federal Employees Health Benefits Program (FEHBP) and Federal Employees' Group Life Insurance Program (FEGLIP) and may continue to participate after retirement. DNFSB 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 DNFSB 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 DNFSB are reported on the Statement of Changes in Net Position and the Statement of Financing.

Note 9– Other Liabilities

Other liabilities with the public for the years ending September 30, 2006 and 2005 consist of Accrued Funded Payroll and Leave and Unfunded Leave in the amounts shown below.

	With the Public	Non-Current	Current	Total
2006	Other Liabilities	$830,076	$533,606	$1,363,682
2005	Other Liabilities	$830,320	$498,908	$1,329,228

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 DNFSB employees under FECA are administered by the Department of Labor and are paid, ultimately, by the DNFSB.

The DNFSB recorded an estimated liability for claims incurred, but not reported as of September 30, 2006 and 2005, as follows:

	2006	2005
Worker's Compensation	$5,376	$2,213

Note 11 – Leases

The DNFSB 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 2006 and FY 2005 under the terms of its leases amounted to $2,067,960 and $1,979,859, respectively. The DNFSB 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
2007	$ 2,158,406
2008	$ 2,188,819
2009	$ 2,220,145
2010	$ 2,252,410
2011	$ 2,285,643
2012 and thereafter	$10,513,891
Total Estimated Future Lease Payments	$21,619,314

Note 12 – Intra-governmental Costs

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

	Intra-governmental Costs	Costs with the Public	Total Program Costs
FY2006	$3,200,105	$17,418,474	$20,618,579
FY2005	$3,047,707	$17,028,948	$20,076,655

The DNFSB's FY20006 program costs/net cost of operations) by OMB Object Class (OC) are as follows:

OC	Description	Amount
11	Personnel Compensation	$10,325,882
12	Personnel Benefits	$ 3,384,373
21	Travel & Transportation of Persons	$ 700,142
22	Transportation of Things	$ 90,604
23	Rent, Communications, & Utilities	$ 2,211,417
24	Printing & Reproduction	$ 33,023
25	Other Contractual Services	$ 3,302,191
26	Supplies & Materials	$ 197,126
31	Acquisition of Assets	$ 373,821
	Total	$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 DNFSB for good and services received). The amount of each is as follows:

	Undelivered Orders	Accounts Payable	Unpaid Obl. Balance, Net
FY2006	$3,773,163	$1,262,671	$5,035,834
FY2005	$4,126,443	$835,906	$4,962,349

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 DNFSB include current appropriations, unobligated appropriations and recoveries of prior year obligations. For FY 2005, no differences exist between the amounts on the Statements of Budgetary Resource and the amounts in the FY 2007 President's Budget. As the FY 2008 President's Budget is not yet available, comparison between the Statement of Budgetary Resources and the actual FY 2006 data in the 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:

FY2006

	FY2005	FY2006	Change
Unfunded Annual Leave	$830,320	$830,076	($244)
Workers Compensation	$ 2,213	$5,376	$3,163
Total	$832,533	$835,452	$2,919

FY2005

	FY2004	FY2005	Change
Unfunded Annual Leave	$812,224	$830,320	$18,096
Workers Compensation	$ 1,192	$ 2,213	$ 1,021
Total	$813,416	$832,533	$19,116

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.

APPENDIX A: Actual Performance Results for Prior Fiscal Years

The DNFSB 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 DNFSB's strategic plan. The changes to the plan are evolutionary in nature and primarily result in increased DNFSB 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 DNFSB's performance relative to its Strategic Plan and its Annual Performance Plans is available in previous year Performance Reports published on the DNFSB's website at *www.dnfsb.gov*. The tables that follow provide abbreviated summaries and information concerning the DNFSB's actual performance in FY 2005, FY 2004, and FY 2003.

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 health and safety of the workers and the public.

Examples of FY 2005 Accomplishments

Safety Basis at Pantex. The Implementation Plan for DNFSB 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 DNFSB's request, senior DOE management is now providing monthly status briefings to the DNFSB, which has focused management attention on completing these commitments, and improving safety at the Pantex Plant.

Nuclear Material Packaging. On March 10, 2005, the DNFSB 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 DNFSB'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 DNFSB 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 DNFSB. Implementation will commence in FY 2006.

Special Tooling Program at Pantex. In a letter dated December 15, 2004, the DNFSB 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 DNFSB 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 DNFSB'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 DNFSB has now closed this recommendation.

Lightning Protection at Pantex. In a letter dated November 3, 2004, the DNFSB 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 DNFSB also noted slow progress in addressing the potential for an indirect coupling mechanism from a lightning strike having an impact 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB. 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 DNFSB 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 DNFSB 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 DNFSB assessed conditions at the laboratory and reviewed its restart approach. The DNFSB emphasized the need to closely monitor and appropriately adjust plant conditions to maintain a safe and stable configuration during the stand-down.

The DNFSB supplemented its full-time site-representatives with additional staff to provide real-time feedback to DOE and LANL personnel responsible for resumption activities. The DNFSB 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 DNFSB, 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 DNFSB continued to evaluate the safety of the LANL full-scale aqueous processing line for plutonium-238. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB'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 DNFSB issued a letter to DOE on December 16, 2004, identifying these problems. The RFP was subsequently amended to address the issues raised by the DNFSB, significantly strengthening DOE's safety posture at the laboratory.

Safety Basis at Sandia National Laboratories, New Mexico. In late FY 2005, the DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB reviewed the new glovebox installation and hazard analysis for the Assembly/Disassembly Building at Y-12. Discussion of the results of the DNFSB'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 DNFSB 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 DNFSB reviewed Y-12 processes for conducting independent implementation validation reviews for documented safety analysis (DSA) controls developed under 10 CFR 830. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 health and safety of the workers and the public.

Examples of FY 2004 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 DNFSB 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 DNFSB'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 DNFSB 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 DNFSB 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 FY2004, 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 DNFSB 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 DNFSB identified deficiencies in the safety basis for Building 332, the Plutonium Facility, at LLNL. In particular, the DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB and after an LANL review of a safety requirement violation at TA-18 identified weaknesses that reinforced concerns raised by the DNFSB.

Improvements in Quality Assurance related to the Tooling Program at Pantex. In a June 18, 2004-letter, the DNFSB 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 DNFSB noted that an effective quality assurance program is essential to the safe design, fabrication, procurement, inspection, and maintenance of special tooling. The DNFSB 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 FY2003 and FY2004, the DNFSB'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 DNFSB expressed concerns regarding the maintenance of hoisting equipment, the safety classification of hoisting, vendor communication, and training for emergency scenarios. The DNFSB 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 DNFSB 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 DNFSB'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 & Inspection Program. The W78 Disassembly & 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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.

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.

Examples of FY 2003 Accomplishments

W84 Disassembly and Inspection Operations. W84 disassembly and inspection operations have not been conducted at Pantex since 1998, and the authorization basis is no longer valid. The DNFSB briefed National Nuclear Security Administration (DOE) management on several occasions regarding efforts to restart the W84 disassembly and inspection operations without an adequate authorization basis. The DNFSB raised numerous potential safety issues, which resulted in DOE conducting an internal study that ultimately validated the DNFSB's concerns. W84 operations have been postponed until these issues can be adequately addressed.

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 DNFSB issued Recommendation 2002-2, *Weapons Laboratory Support of the Defense Nuclear Complex*. DOE's Implementation Plan (IP) was negotiated over the next several months and was issued on June 30, 2003. DOE has taken preliminary steps to reemphasize the priority of nuclear weapons work. DOE is also establishing at each site an office that will track and ensure closure of nuclear safety support requirements for weapon laboratories.

Storage of "Pits." Continuing to respond to the DNFSB's Recommendation 99-1, *Safe Storage of Fissionable Material called "Pits,"* in FY 2003, DOE repackaged its 7500th pit into a robust container suitable for interim storage. The associated container surveillance program has also been rejuvenated; almost all of the surveillance backlog will be eliminated by the end of FY 2003.

Criticality Safety at Y-12. The DNFSB expressed its concern that line management at Y-12 was not placing sufficient emphasis on simplifying and standardizing all fissile material handling operations in order to build a criticality safety program structured to assure success. The confusing controls that exist in many current Y-12 facilities with many different forms of uranium, dozens of different containers, and different postings for storage arrays have resulted in a significant number of operator failures. The letter stated that the standardization should extend to requirements, postings, and containers. In response, DOE has started to reduce the amount of stored nuclear materials and to standardize fissile material storage containers.

Nuclear Explosive Operations at Pantex. The DNFSB 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 DNFSB'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 earlier than planned. In FY 2003, DOE completed the start-up of the Seamless Safety for the 21st Century (SS-21) W62 Disassembly & Inspection Program. This program is now significantly safer and more robust than weapons programs to which the SS-21 process has not yet been fully applied. In FY 2003, the Pantex contractor took delivery of the prototype SS-21 tooling for W88 bay operations and W78 bay and cell operations.

Procedural Compliance at Pantex. In October 2001, the DNFSB sent DOE a letter expressing concern with the increasing number of procedural adherence issues observed at Pantex. Although an action was initiated to address this problem, in March 2002, the DNFSB wrote DOE, noting that further improvements were still warranted. During FY 2003, observations indicate that a significant improvement has been achieved.

Building 12-64 Seismic Analysis at Pantex. In 1998, the DNFSB wrote to DOE expressing concern with the seismic response of Building 12-64. In 2002, DOE informed the DNFSB of its intention to upgrade Building 12-64 in preparation for resuming nuclear explosive operations there. Subsequent meetings and discussions in FY 2002 and 2003 between DOE personnel and the DNFSB's staff have identified concerns with analyses that had been completed to address the DNFSB's original concerns. Although DOE's conceptual design for upgrading Building 12-64 addresses the concern for the seismic response of the facility, specific details regarding corrective actions are lacking. Efforts to improve the analyses and identify potential engineering solutions continue.

Pantex Fire Protection. In FY 2003, DOE completed modification of the fire detection and suppression system in Building 12-44 and completed its Readiness Assessment Report for Fire Protection at the Pantex Plant. DOE has taken beneficial occupancy of the 12-44 facilities. DOE experienced numerous delays within their readiness activities for fire protection and completion of the fire protection final report. Under the impetus of continual DNFSB urging, DOE ultimately completed the Readiness Assessment Report for Fire Protection, and delivered it to the DNFSB as Commitment 4.3.2 to Recommendation 98-2.

Improvements in Safety Bases for the Pantex Plant. Fulfilling commitments made in response to Recommendation 98-2, DOE completed the Transportation Safety Analysis Report, Phase 1, Group 1, Readiness Assessment; the Readiness Assessment Report for Fire Protection; and approved the Transportation Safety Analysis Report (SAR) and Technical Safety Requirements (TSRs), as well as Pantex Zone 12 & Zone 4 Staging Facilities SAR and TSRs. Although these accomplishments provide improvements in the safety bases for the Pantex Plant, final implementation of these onsite transportation controls remains to be completed. The DNFSB continues to urge DOE to expedite the implementation of onsite transportation controls.

NTS Readiness to Dispose of a Damaged Nuclear Weapon. The DNFSB 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 2003, DOE responded by improving its capabilities to conduct these activities safely, including making further physical improvements to and maintaining G-tunnel, conducting training on specific hazards and controls and disposition capabilities, beginning the development of a safety basis for G-tunnel, and beginning to improve NTS conduct of operations. 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 such a need arise).

Emergency Power System at the LLNL Plutonium Facility. In April 2002, the DNFSB identified deficiencies in LLNL's emergency electrical power system, which did not meet safety-class standards and IEEE codes. As a result of the DNFSB's efforts, LLNL developed an action plan to correct the deficiencies. As of August 2003, LLNL has completed most of the commitments related to this action plan, including system upgrades and updating important system drawings and calculations. The remaining commitments will ensure that the system will be assessed against appropriate electrical standards, and that backfits involving further upgrades will be considered, if necessary.

Lightning Protection at LANL. The DNFSB 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. In addition, the DNFSB submitted a report presenting additional deficiencies with the lightning protection systems at various facilities at LANL. In March 2003, a subject matter expert study of the WETF lightning protection system concluded that the existing system could not perform its safety-class function. To adequately protect this operating nuclear facility against lightning hazards, a defensible lightning protection scheme must now be developed and implemented at WETF.

Deficiencies in LLNL Safety Bases. The DNFSB identified significant deficiencies in the current safety bases for some of LLNL's defense nuclear facilities, most notably the Plutonium Facility, Building 332. A lack of vigorous DOE oversight has allowed these deficiencies to exist for years. In a letter dated April 10, 2003, the DNFSB established a 60- day reporting requirement for DOE to ensure that these identified weaknesses are adequately addressed in a timely manner or establish appropriate compensatory measures until the deficiencies can be adequately addressed.

Subcritical Experiments. The DNFSB 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 2003, DOE's Nevada Site Office committed to improve the safety basis documents, develop a USQ process, and improve the readiness review process. As a result, subcritical experiment program requirements are being revised, safety basis documents are being improved, and a USQ process is being developed.

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 are performed in a manner that ensures adequate protection of health and safety of the workers and the public.

Examples of FY 2005 Accomplishments

Nuclear Material Stabilization and Storage at LANL. The DNFSB 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 DNFSB continued to ensure that DOE addressed safety issues communicated to DOE in previous years.

Surveillance and Monitoring Program for Plutonium Storage. The DNFSB 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 DNFSB provided feedback on the scientific and statistical methodology being employed for surveillance of plutonium in storage.

High-Level Waste Tank Integrity. The DNFSB closely followed the HLW tank integrity program for double-shell tanks at Hanford. The DNFSB 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 DNFSB's request, and sponsored laboratory corrosion studies to establish optimum waste chemistry limits for maintaining tank integrity. In a letter to DOE, the DNFSB noted that laboratory studies for vapor space corrosion within the tanks was not included. DOE is assessing the feasibility of including vapor space corrosion studies in the program.

Hanford Tank Farms Integrated Safety Management. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB, the contractor at SRS made safety equipment upgrades on HLW Tanks 3, 11, and 41 at the 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 DNFSB 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 DNFSB's suggested improvements.

Hanford Spent Nuclear Fuel Project. The DNFSB'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 DNFSB 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 DNFSB led the contractor to make design changes and DOE to commission a Sludge Review DNFSB to provide additional oversight. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB reviewed decommissioning activities at the Plutonium Finishing Plant (PFP) and identified safety issues regarding the criticality safety and fire protection programs. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB and the site readiness review teams found several deficiencies in the Silos 1 and 2 project and determined that corrective actions were needed before radioactive operations could begin. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB, 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 are performed in a manner that ensures adequate protection of health and safety of the workers and the public.

Examples of FY 2004 Accomplishments

Nuclear Material Stabilization and Storage at LANL. As part of the implementation of the DNFSB's Recommendations 94-1 and 2000-1, the DNFSB 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 DNFSB evaluated NNSA plans for managing non-programmatic actinide materials stored at LANL, LLNL, SNL, the Pantex Plant, and Y-12. The DNFSB 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 DNFSB 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 DNFSB, the Assistant Secretary for Environmental Management restored the funding for this program for fiscal year 2004. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 controls such as Process Control Plans, convened a second independent review to ensure all safety controls had been implemented, and increased the frequency of key tank waste measurements to better ensure that the safety of current waste conditions was understood.

Salt Waste Processing Facility at SRS. The DNFSB 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 DNFSB 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 DNFSB'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 DNFSB 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 DNFSB reviewed the tank inspection program at Hanford and proposals to relax requirements for corrosion inhibitors in the tank waste. The DNFSB 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 DNFSB'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 DNFSB continued to provide close oversight of the contractor's efforts to start the retrieval of sludge from the K-East Basin at Hanford. The DNFSB 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 DNFSB 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 DNFSB reviewed the DOE-authored Basis for Interim Operation for the operation of mobile transuranic waste characterization units. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB, 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 DNFSB 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 DNFSB 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 DNFSB reviewed the safety analysis for the Silo 3 waste disposition project and raised questions regrading 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB letter regarding storage of sodium fluoride traps containing uranium-233 hexafluoride in Building 3019, the DNFSB 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.

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.

Examples of FY 2003 Accomplishments

Inactive Actinide Materials. The DNFSB evaluated the National Nuclear Security Administration's (NNSA) plans for improving the management of non-programmatic actinide materials stored at sites such as Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and the Y-12 National Security Complex (Y-12). The DNFSB found that NNSA did not 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 DNFSB continues to evaluate the approaches taken by each NNSA site, as well as the programmatic direction provided by NNSA Headquarters.

Depleted Uranium at Savannah River Site (SRS). The DNFSB continued to pursue the disposition of depleted uranium stored in inadequate containers and facilities at SRS. During FY 2003, the disposal of the most vulnerable materials began safely with the first shipments of such items to an offsite low-level waste disposal facility.

High-Level Waste Tank Integrity. During FY 2003, as the culmination of an effort that began with the DNFSB's Recommendation 2001-1 in 2001, the DNFSB obtained a commitment from DOE to accomplish ultrasonic inspections of all double-shell high-level waste tanks at SRS by 2006. This plan represents a significant increase in scope and a significant acceleration compared with the proposed inspection program.

Documented Safety Analysis for the SRS High-Level Waste System. The DNFSB's review of the new documented safety analysis for the high-level waste facilities at SRS found that it did not provide a bounding unmitigated accident analysis as required by DOE directives. This problem resulted from the use of non-bounding input values and assumptions regarding operator actions to detect and terminate accidents. In response to a DNFSB letter on this subject, DOE required the contractor to perform additional analyses and to implement specific administrative controls to protect assumptions made in the documented safety analysis.

Advanced Mixed-Waste Treatment Project. The DNFSB identified significant shortfalls in the quality of the activity-level hazards analysis performed to support the identification of effective controls to protect workers involved in waste retrieval in the Advanced Mixed-Waste Treatment Project at the Idaho National Engineering and Environmental Laboratory (INEEL). In response, DOE required the contractor to implement conservative protective measures and to improve its analysis of the hazards associated with this work.

Hanford Spent Nuclear Fuel Project. The DNFSB evaluated readiness preparations for startup of the K-Basins Fuel Transfer System and determined that the contractor had not corrected persistent problems regarding the premature declaration of readiness to operate. DOE identified a series of corrective actions that proved to be inadequate, as demonstrated by the failed attempt to start up the K-East Basin Sludge Water System later in the fiscal year. The DNFSB is continuing to provide input and oversight as DOE works to solve this problem.

Laboratory Support for Long-Term Plutonium Storage. The DNFSB identified that DOE was not planning to provide adequate resources for surveillance, laboratory testing, and shelf-life studies, which provide essential technical support for the safe long-term storage of plutonium. In response, DOE committed to provide adequate resources to continue the required activities and to develop a program plan that would identify how these activities would be carried out in future years.

Sodium Fluoride Traps at Oak Ridge National Laboratory (ORNL). DOE has begun to take actions in response to a letter issued by the DNFSB in late-FY02 regarding the safe storage of sodium fluoride traps containing uranium-233. These vessels store uranium-233 recovered from the Molten Salt Reactor Experiment, and are becoming pressurized from radiolytic gas production. ORNL has completed the depressurization of several traps in the interim, and is evaluating the results to determine the path forward for the remaining traps.

Fernald Closure Project. A review by the DNFSB indicated significant progress is being made toward cleaning up and remediating the Fernald Site. However, there has been an increase worker injuries and near misses. The site attributed this rise in the accident rate to an increase in the number of new workers and the greater amount of work being performed on the site. The DNFSB informed DOE that additional training to identify clearly the safety responsibilities and activities of all levels of management, the development of performance-based safety incentives for the contractor, and a more thorough screening of the qualification of new workers ought to be considered.

Rocky Flats Environmental Technology Site (RFETS) Vandalism. In May 2003, the DNFSB learned that 14 high-efficiency particulate air filters installed in the Building 771 ventilation exhaust system had been vandalized by decommissioning workers and had to be replaced. The DNFSB's evaluation of this event found that the report filed by RFETS in the DOE Occurrence Reporting and Processing System was inaccurate and did not acknowledge that the filter deficiencies were the result of deliberate vandalism. The DNFSB further determined that neither the manager of the DOE Rocky Flats Field Office nor appropriate personnel within DOE Headquarters were aware of the vandalism. A corrected occurrence report was issued after the DNFSB notified DOE Headquarters of the situation. The DNFSB discussed this matter directly with the senior management of the RFETS contractor and the DOE field office manager to ensure they understood the seriousness of the workers' actions and the inaccurate reporting of this incident.

RFETS Building 371 Fire. The DNFSB evaluated a significant fire that occurred on May 6, 2003, during glovebox removal activities in Building 371 at RFETS. The DNFSB's review confirmed DOE's findings that inadequate work planning was a key contributor to the fire and that the workers' response to the fire could have resulted in serious harm to the workers, but found that the site's investigation into the cause of the fire was not adequate. The DNFSB issued correspondence requesting DOE to document measures that had been taken to ensure that ongoing glovebox removal operations were safe and to ensure that materials recovered from the scene of the fire were adequately analyzed to support determining the cause of the fire. The DNFSB further determined that there were fundamental weaknesses in procedure compliance by decommissioning workers and in DOE oversight, including the failure to provide DOE Facility Representatives to cover decommissioning activities in Building 371. These problems were identified to DOE, and corrective actions continue.

Activity Level ISM of Hanford Decommissioning Work. The DNFSB continued to review planning and implementation of work being done at Hanford. The DNFSB found that the work control procedures and practices need improvement to meet the intent of Integrated Safety Management and the DOE Orders and Guides for worker protection. The approach to hazard analysis does not use techniques such as those described by the American Institute of Chemical Engineers Guidelines for Hazard Evaluation Procedures, or the U.S. Department of Labor, Occupational Safety and Health (OSHA) publication, OSHA 3071, Job Hazard Analysis. These deficiencies are such that it is not clear that the controls are adequate to protect personnel performing decommissioning work at Hanford. Areas in need of improvement have been communicated directly to DOE. Some improvements are being implemented and have proven to be effective, however further effort is necessary.

Mound Closure Project. The DNFSB reviewed decommissioning activities at Mound following the implementation of a new accelerated closure contract. DOE plans to reduce and relocate the DOE site office staff, while accelerating cleanup of the site. The DNFSB informed DOE that the impacts on DOE's ability to provide adequate safety oversight of closure activities needed to be addressed.

Lawrence Livermore National Laboratory. The DNFSB reviewed preparations for deactivation of Building 251 at the Lawrence Livermore National Laboratory and observed a readiness assessment for removal of heavy elements from the underground storage vaults. Weaknesses in conduct of operations and the use of procedures were identified to the laboratory. Corrective actions are in progress.

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 health and safety of the workers and the public.**

Examples of FY 2005 Accomplishments

The DNFSB's 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 DNFSB 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 DNFSB 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 DNFSB, DOE is now evaluating design solutions to address the issue.

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

- The DNFSB 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 DNFSB 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 DNFSB'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, as well. DOE commissioned an independent review team of subject matter experts to review the DNFSB's issue. This independent review team agreed with the DNFSB's issue and made recommendations to improve the design criteria for the facility. As a result, DOE is developing new criteria to ensure that the design of the facility will adequately confine hazardous materials. The DNFSB has also informed DOE of the concerns with the DOE directives associated with developing facility design criteria.

Pit Disassembly and Conversion Facility. The DNFSB continued to review the safety of the design of the Pit Disassembly and Conversion Facility (PDCF). The DNFSB found the Preliminary Documented Safety Analysis comprehensive and acceptable. However, the DNFSB 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 DNFSB 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 DNFSB'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 DNFSB'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 DNFSB reviewed the major safety aspects of the Critical Decision 1 package submittal. In a letter dated February 24, 2005, the DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB. 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 DNFSB 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 DNFSB issued its annual update to Congress. The DNFSB 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 DNFSB 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 health and safety of the workers and the public.

Examples of 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 DNFSB 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 DNFSB issued its initial report as well as a follow up report to Congress. The DNFSB 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 DNFSB 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 DNFSB was concerned that the design of equipment in these areas were not sufficiently robust to operate normally for 40 years without maintenance. The DNFSB 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 DNFSB 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 their approval of safety-related expectations (codes, major design changes, and safety control modifications) to the contractor. As a result of the DNFSB'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.

High Enriched Uranium Materials Facility at Y-12 National Security Complex. The DNFSB has continued its design reviews of the High Enriched Uranium Materials Facility (HEUMF). Based on detailed reviews, the DNFSB identified concerns with important safety systems such as the structure, electrical, ventilation, and instrument and control (I&C) systems. Based on these DNFSB 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 DNFSB.

Pit Disassembly and Conversion Facility. The DNFSB has been reviewing the structural design for the Pit Disassembly and Conversion Facility (PDCF) to be located at the Savannah River Site. The DNFSB 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 DNFSB letter dated May 13, 2003, the contractor conducted a fire risk analysis to assess a seismically induced full-facility fire. The DNFSB 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 DNFSB noted that DOE was not addressing the structural weaknesses of the bays in Building 12-64 during conceptual design of upgrades. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB, 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 DNFSB 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 DNFSB, DOE issued an update to this important handbook in December 2003. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB identified weaknesses with the proposed revision to the Electrical Safety Handbook, DOE-HDBK-1092-98. The DNFSB 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 a guidance for effective electrical safety program. This version is under review.

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 health and safety of the workers and the public.

Examples of FY 2003 Accomplishments

Hanford Waste Treatment Plant. The DNFSB continued to review the design and construction activities related to the Hanford Site's Waste Treatment Plant. Reviews of concrete quality, structural adequacy, site geotechnical, process safety, electrical system design, and adequacy of standards were conducted. The DNFSB issued letters on November 4, 2002, addressing safety and design basis concerns; January 21, 2003, addressing Hanford ground motion issues; March 7, 2003, addressing electrical concerns; and on May 29, 2003, addressing authorization basis and standards issues. Resolution of the issues raised by the DNFSB is taking place as the design progresses.

High Enriched Uranium Materials Facility (HEUMF). In a DNFSB letter dated December 27, 2002, concerns were expressed about the confinement system design for HEUMF at the Y-12 National Security Complex, which was based on isolation (holdup) of the facility following a design basis fire event. The DNFSB also identified potential inadequacies related to the form and packaging requirements of uranium for long-term storage at HEUMF. In response, the ventilation system design has been modified to address this safety issue and the contractor is developing a plan to evaluate facility storage containers and determine a minimum set of storage containers that meet facility safety and operational needs.

HEUMF–Geotechnical. In December 2002, the DNFSB informed DOE about concerns with the foundation design for the HEUMF. The contractor had started the structural design process without completing the geotechnical report and using only a best estimate of the required seismic loading. Also, the proposed foundation fill material had not been tested and the response of this material under earthquake loading was unknown. The contractor has subsequently completed the necessary geotechnical studies to address the DNFSB's concerns and is finalizing the foundation design. It was concluded from the studies that the use of limestone fill as a base for the foundation could produce adverse building responses during an earthquake. Currently, the site is evaluating using concrete as the engineered fill below the building foundation.

Nevada Test Site Electrical and Lightning Protection Systems. In a letter dated July 1, 2003, the DNFSB noted that compensatory measures to mitigate potential lightning hazards are needed at the Nevada Test Site (NTS) until robust lightning detection and protection programs have been implemented. The DNFSB also identified deficiencies with the electrical systems for selected facilities at NTS. DOE is evaluating these conditions.

Tritium Extraction Facility Design Review. During the past five years, the DNFSB has conducted extensive design reviews of the Tritium Extraction Facility (TEF) at the Savannah River Site. The DNFSB has provided a series of comments to DOE as the design progressed from its initial conceptual stage to its final form. DOE formally responded to all of the issues raised by the DNFSB and on December 19, 2002, the DNFSB issued a response concurring with DOE's proposed resolution. As a result, the safety of TEF has been significantly improved.

Hanford 221-T Building (T-Plant) Design. The T-Plant has been proposed as a potential storage facility for K-Basin sludge. Due to the age (built in 1944) and configuration of the structure, this facility presented a unique condition, to which the Uniform Building Code's simplified procedures were not easily applied. The DNFSB conducted a structural evaluation and informed DOE in a letter dated May 30, 2003, that the structure was adequate for it's intended storage mission, but new missions that increased the material at risk would require further evaluation.

Fire Safety at LANL. The DNFSB continued to follow the fire protection upgrade program and Cerro Grande Fire recovery work currently underway at Los Alamos National Laboratory (LANL). In a January 2003 letter to the Secretary of Energy, the DNFSB expressed concern over the safety impacts of rescinding $75M of Cerro Grande funds on fire protection projects. The funds were subsequently reinstated for these critical projects.

Pit Disassembly and Conversion Facility. The DNFSB has been reviewing the Title I design for the Pit Disassembly and Conversion Facility (PDCF). While the main structure of the PDCF Plutonium Processing Building was designed to survive the design basis earthquake, this is not the case for many of the 2-hour fire barriers between fire zones. As a result, a postulated seismically-induced full-facility fire could lead to calculated offsite dose that exceed the evaluation guideline. The DNFSB issued a letter on May 13, 2003, urging DOE to consider upgrading the design of the fire barriers to withstand the design basis earthquake, eliminating the potential for a full-facility fire.

Emergency Operations Center at LANL The DNFSB identified a weakness in DOE's plans for construction of a new Emergency Operations Center (EOC) at LANL. Located on a seismic fault, the EOC could itself become nonoperational during a seismic event, and thus be unable to coordinate emergency operations related to that event. The DNFSB suggested that it would be better to consider the new EOC as one element in an emergency system that included an older EOC and a mobile command center. In FY 2003, a mobile command center was procured and the new EOC system is now nearing completion.

Plutonium-238 Scrap Recovery Line at LANL. In FY 2003, the DNFSB urged DOE and LANL to take action to address safety issues with startup of the new Pu-238 scrap recovery line that had been identified by the DNFSB in FY 2002. DOE and LANL have taken some actions to improve safety, including revising the process hazard analysis. The DNFSB continues to urge DOE and LANL to make improvements in implementing engineered controls and Technical Safety Requirements (TSRs) that are appropriate for a production operation. While these activities are in progress, LANL and DOE have deferred the start-up of the scrap recovery line.

LANL Classified Experiment. For several years, the DNFSB has pushed for resolution of longstanding concerns regarding the hazards of certain portions of the operations associated with the LANL dynamic experiments. The DNFSB has observed some improvements; however, the preliminary design review suffered from inadequate coverage of the relevant engineering disciplines and limited participation from the reviewers. These concerns were communicated to DOE and LANL management. As a result, portions of the design review will be repeated. The DNFSB also successfully enforced agreement on a project standard on vessel construction.

Plutonium Storage at SRS. In response to a Congressional reporting requirement, the DNFSB has performed numerous reviews of the adequacy of facilities and systems for long-term storage of plutonium at SRS. This study is not yet complete, but the DNFSB has already informed DOE of several issues of near-term safety significance regarding fire protection; lightning protection; electrical, instrumentation, and control systems; and the safety bases for plutonium storage and packaging facilities at SRS.

GOAL 4 — NUCLEAR SAFETY PROGRAMS AND ANALYSIS

Performance Goal 4	**Nuclear Safety Programs and Analysis.** DOE develops, maintains, and implements regulations, requirements, and guidance; and establishes and implements safety programs at defense nuclear facilities as necessary to ensure adequate protection of health and safety of the workers and the public.

Examples of FY 2005 Accomplishments

DOE Directives. As part of its ongoing review of new and revised DOE directives, the DNFSB 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 DNFSB 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 DNFSB 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 DNFSB'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 DNFSB 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 DNFSB conducted numerous reviews of the safety bases throughout the DOE complex. The DNFSB 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 DNFSB identified a number of specific weaknesses in the development and implementation of the safety bases at defense nuclear facilities. In particular, the DNFSB 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 DNFSB 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 DNFSB continues to follow DOE's activities associated with the use of quantitative risk assessment at Defense Nuclear Facilities. Previously, the DNFSB 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 DNFSB's review suggested that DOE and its contractors have employed quantitative risk assessment in a number 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 DNFSB'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 DNFSB conducted eight public hearings to examine DOE's and NNSA's current and proposed methods of ensuring safety at its defense nuclear facilities. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB's Recommendation, however, the DOE implementation plan submitted to the DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 DNFSB 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 analyses 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 DNFSB 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 develops, maintains, and implements regulations, requirements, and guidance; and establishes and implements safety programs at defense nuclear facilities as necessary to ensure adequate protection of health and safety of the workers and the public.

Examples of FY 2004 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 DNFSB is required by law to review and evaluate all applicable DOE Orders, regulations, and requirements. The DNFSB 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 DNFSB's issues could be resolved. The DNFSB 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 DNFSB 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 DNFSB 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 DNFSB'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 DNFSB 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 DNFSB 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 DNFSB conducted numerous reviews of the site-specific safety bases throughout the DOE complex. In particular, the DNFSB 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 DNFSB 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 DNFSB 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 DNFSB'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 DNFSB, 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 DNFSB 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 DNFSB'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 DNFSB 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 DNFSB 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 DNFSB broadened their concern 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 DNFSB 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 DNFSB 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 DNFSB, 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 DNFSB 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 DNFSB 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 DNFSB 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.

Performance Goal 4	Nuclear Safety Programs and Analysis. **DOE develops, maintains, and implements regulations, requirements, and guidance; and establishes and implements safety programs at defense nuclear facilities as necessary to ensure adequate protection of health and safety of the workers and the public.**

Examples of FY 2003 Accomplishments

DOE Directives. As part of its ongoing review of new and revised DOE directives, the DNFSB and its staff evaluated and provided constructive critiques of 34 directives associated with, but not limited to, worker protection management, electrical safety, software quality assurance, and DOE's Occurrence Reporting and Processing System. At year's end, both staffs were in the process of resolving issues on 26 pending directives to improve the content, clarity, and consistency in safety requirements and guidance. Examples include:

- **Worker Protection Management.** Members of the DNFSB's staff worked closely with DOE to revise the requirements in Change 1 to DOE Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*. This effort was completed in June 2003, culminating in an updated directive that included important new biological agent protection requirements developed in response to increased homeland security awareness.
- **Electrical Safety.** In June 2001, the DNFSB had urged DOE to take a proactive stance to ensure adequate electrical safety. DOE agreed to update the *Electrical Safety Handbook* in August 2002. However, in July 2003 the DNFSB learned that DOE had deleted much of the technical content in the proposed revision. The DNFSB informed DOE that this was unacceptable, especially in light of the high rate of electrical safety incidents observed across the defense nuclear complex. DOE is now revising the handbook.
- **Environment, Safety and Health Reporting.** During most of 2003, the DNFSB worked closely with DOE to consolidate and revise the various DOE reporting orders into a single directive. The DNFSB provided formal comments on draft DOE Order 231.1A, *Environment, Safety and Health Reporting*, plus its many supporting documents, including DOE Manuals 231.1-1, 231.1-2, *Occurrence Reporting and Processing of Operations Information*, and DOE Guides 231.1-1, *Occurrence Reporting and Performance Analysis Guide*, and 231.1-2, *Occurrence Reporting Causal Analysis*. These revisions, which are key to maintaining a strong feedback and improvement program across the defense nuclear complex, are being implemented at the start of FY 2004. The DNFSB will monitor closely the effectiveness of the revised program during this implementation phase.

National Nuclear Security Administration (NNSA) Policy Letters. During FY 2003, NNSA instituted an internal system of directives under the authority of Public Law 106-65. However, the DNFSB initiated a review of the system and found that the system architecture had not been adequately described, directives being issued were potentially in conflict with existing DOE directives, and all of the conditions of the public law had not yet been satisfied. The DNFSB worked closely with NNSA throughout the year to design a system that would meet the needs of NNSA, while protecting the integrity of the environment, safety, and health requirements already established under DOE. This effort will continue into FY 2004. In the interim, the DNFSB has reviewed 22 advance copies of proposed NNSA Policy Letters, in anticipation of their issue.

Software Quality Assurance: Considerable DNFSB resources were expended during FY 2002 reviewing draft DOE Order 203.X, *Software Quality Assurance (SQA)*. As a result of inadequate progress toward resolution of the DNFSB's concerns with SQA, on September 23, 2002, the DNFSB issued Recommendation 2002-1, *Quality Assurance for Safety-Related Software*. Development of the Implementation Plan (IP) for this recommendation required significant interaction between the DNFSB and DOE—it was finally accepted by the DNFSB on April 10, 2003. The DNFSB will follow DOE's implementation efforts closely in FY 2004. In a related effort, members of the DNFSB's staff are leading efforts to revise and update ANSI/ANS Standard 10.4, *Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry*. This standard will be important to both the Nuclear Regulatory Commission (NRC) and DOE.

Integration of Hazards Analyses. The DNFSB reviewed the contents of several DOE directives that contain requirements for hazard and accident analyses, performed site reviews, and identified less-than-adequate implementation of safety requirements due to inconsistencies and lack of integration of the directives. The directives included DOE Guides for implementation of 10 CFR 830, and DOE Orders 151.1A, 420.1, and 451.1A. As a direct result of the DNFSB's activities, DOE issued a handbook entitled *Integration of Multiple Hazard Analysis Requirements and Activities*, which has helped several DOE contractors to perform their activities in a safer, more integrated, and significantly more cost effective manner. Several contractors realigned their organizational structure to benefit from the DNFSB's findings and achieved improved operational safety.

Safety Analysis Methodology. As part of its ongoing review of the adequacy of health and safety directives, the DNFSB noted a number of weaknesses with respect to the implementation of the methodology associated with the performance of safety analyses at several defense nuclear facilities. Consequently, the DNFSB issued a series of letters to the Secretary of Energy outlining these concerns. As a result, the Department committed to increased attention and vigilance in its acceptance and oversight of documented safety analyses.

Design Requirements and Guidance for Facilities. The DNFSB had previously noted that the design requirements for nuclear facilities in DOE Order 420.1, *Facility Safety,* and its associated guidance documents were not being implemented at LANL and requested a report describing the status of implementation of the DOE Order and applicable guidance at all NNSA sites having defense nuclear facilities. Such requirements and guidance are important for properly selecting discipline-specific industry codes and standards for safety-class and safety-significant structures, systems and components. As a result, NNSA has now developed complete crosswalks between the codes and standards in the implementation guide and those in the appropriate contractor documents such as design manuals, design criteria, and procedures, and is having contractors update their internal requirements and guidance documents.

National Nuclear Security Administration Training and Qualification. In a letter dated June 5, 2003, the DNFSB 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 DNFSB broadened their concern 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 has initiated a review at all field sites. Necessary corrective actions will be implemented in FY 2004.

Functions Responsibilities and Authorities (FRA) Documents. The DNFSB 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. Despite significant effort on the part of the DNFSB, DOE remains without a credible FRA Manual at the corporate level, and without sub-tier FRAs in a number of DOE organizational elements. The DNFSB will continue to work with the DOE program offices throughout FY 2004 to revise their FRA documents to ensure safety roles and responsibilities are clearly defined.

Contractor System Engineers. The DNFSB worked with DOE to develop formal training and qualification requirements for contractor system engineers in response to DNFSB Recommendation 2000-2, *Configuration Management, Vital Safety Systems*. The DNFSB conducted progress reviews of the programs at the Y-12 National Security Complex, the Pantex Plant, the Hanford Site (Fluor Hanford, CH2M Hill, and Pacific Northwest National Laboratory), and Lawrence Livermore National Laboratory (LLNL), finding that the effectiveness of site contractors' systems engineer programs varied significantly. Only the contractors for Y-12 and the Hanford tank farms had maturing, well-founded, and robust programs. The contractors' systems engineer programs at the remaining sites suffered from a number of shortcomings and were much less effective. The DNFSB will continue to engage with DOE as the contractors' system engineer programs are implemented.

Federal Technical Oversight of Safety Systems. While maintaining DOE's implementation of DNFSB Recommendation 2000-2, *Configuration Management, Vital Safety Systems*, the DNFSB found that the DOE subject matter expert (SME)/systems engineer programs were weak at all four sites reviewed. Although each DOE site office had established an SME organization, few site offices had a fully staffed and implemented program. DOE SMEs have not yet had a meaningful presence in the field, and the intended benefits from these programs in terms of contractor oversight have yet to be realized fully. While DOE has developed an adequate path forward to provide qualified federal personnel, no site reviewed had fully achieved that objective. The DNFSB will continue to urge DOE to apply more senior management attention and resources to staff and qualify technical personnel for these systems engineering organizations.

Site Specific Safety Reviews. The DNFSB conducted a number of site-specific safety reviews in the DOE complex. In particular, the DNFSB conducted reviews associated with the adequacy of the development and implementation of the documented safety analyses (DSAs) performed as a result of the requirements specified in 10 CFR 830, *Nuclear Safety Management*. The DNFSB performed detailed safety reviews at the following facilities: Savannah River Site (SRS) and Hanford tank farms, Lawrence Livermore National Laboratory (LLNL) plutonium facility, Waste Isolation Pilot Plant (WIPP) remote handled transuranic waste operations, and at the Nevada Test Site (NTS) device assembly facility, radioactive waste management complex and U1a underground facility. During the course of these reviews, the DNFSB identified a number of important safety issues that required resolution by DOE. For example, the SRS review identified the need for additional rigor in the protection of important assumptions and selection of appropriate controls. At LLNL, the DNFSB's review identified the need for additional analysis to ensure the appropriate safety classification of important equipment and also the need for DOE to exercise increased vigilance in ensuring that all the necessary conditions of approval are being met with respect to safety evaluation reports. At NTS, the DNFSB found that NNSA and its primary support contractor did not have adequate staff or nuclear safety management programs to support the operation of nuclear facilities. DOE and NNSA are taking corrective actions for all of these findings.

Administrative Controls. In late 2002, the DNFSB noted that many administrative controls currently serve in safety-related applications, but may not have been developed with the same rigor as an engineered control. As a result, these administrative controls may not always have the same level of reliability as would be expected from an analogous safety-related engineered feature. Therefore, the DNFSB issued Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*. In response, DOE developed an Implementation Plan that committed to strengthen the guidance and expectations associated with the development of administrative controls and to review the existing set of administrative controls to ensure that these revised expectations are being met. This plan will be implemented throughout FY 2004-5.

Software Quality Assurance at the Pantex Plant. The Pantex Plant contractor attempted to reduce errors associated with several administrative control programs by using computer-based systems. Due to inadequate software quality assurance (SQA) practices, there has been a continuing series of problems with the installed Move Right software package, resulting in errors in material control and accountability. Similar problems were noted in

the development of the site's Interactive Electronic Procedures. The DNFSB highlighted these issues to DOE, and significant corrective actions are in progress for both of these software products. Additionally, Pantex procedures for improved SQA are being developed.

Hoisting and Rigging Safety. The DNFSB has noted that reportable hoisting and rigging events continue to occur throughout the defense nuclear complex. As a result, the DNFSB has developed a special initiative to review the adequacy of hoisting and rigging operations at selected DOE facilities. During this fiscal year, the DNFSB completed reviews at the Savannah River Site and the Pantex Plant. Significant feedback for improvement was provided to the respective facilities. As a result of the success of this initiative, additional reviews are planned for the coming fiscal year.

Fire Safety at LANL. In a January 2003 letter to the Secretary of Energy, the DNFSB expressed concern over the safety impacts of rescinding $75M of Cerro Grande funds on fire protection projects, as proposed by DOE. The funds were subsequently reinstated for these critical projects for FY 2003.

Unreviewed Safety Question (USQ) Procedures. The USQ process required by 10 CFR 830.203 is the mechanism for ensuring that the substantial investment in the safety bases for defense nuclear facilities isn't invalidated by undocumented and/or unauthorized changes. In FY 2003, the DNFSB reviewed seven USQ procedures and identified substantial areas of noncompliance with the governing requirements. Responding to discussions of the issues raised, DOE required substantial revisions of the procedures, and required the contractors to include guidance in the procedures submitted for approval that had previously been relegated to documents that were not subject to DOE approval.

APPENDIX B: LIST OF ABBREVIATIONS AND ACRONYMS

BIO ..... **Basis for Interim Operations**
CD ..... **critical decision**
CFR ..... **Code of Federal Regulations**
CY ..... **calendar year**
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**
FR ..... **facility representative**
FRA ..... **Functions, Responsibilities, and Authorities (Manual)**
FTF ..... **Filter Test Facility (at Oak Ridge)**
FY ..... **fiscal year**
GPRA ..... **Government Performance and Results Act**
HLW ..... **high-level (radioactive) waste**
HEPA ..... **high-efficiency particulate air (filter)**
HEUMF ..... **Highly Enriched Uranium Materials Facility**
I&C ..... **instrumentation and control**
IEEE ..... **Institute of Electrical and Electronics Engineers**
INEEL ..... **Idaho National Engineering and Environmental Laboratory**
ISM ..... **Integrated Safety Management**
KAMS ..... **K-Area Material Storage (at SRS)**
LANL ..... **Los Alamos National Laboratory**
LLNL ..... **Lawrence Livermore National Laboratory**
NNSA ..... **National Nuclear Security Administration**
NTS ..... **Nevada Test Site**
OMB ..... **Office of Management and Budget**
ORNL ..... **Oak Ridge National Laboratory**
ORR ..... **Operational Readiness Review**
PDCF ..... **Pit Disassembly and Conversion Facility (at SRS)**
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**
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**