FY 2006
BUDGET REQUEST
TO THE CONGRESS

Defense Nuclear Facilities Safety Board

February 2005

Defense Nuclear Facilities
Safety Board
FY 2006 Congressional Budget Request

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APPROPRIATION & EXPENSE SUMMARY

(Tabular dollars in thousands.)

OPERATING EXPENSES

	ACTUAL FOR FY 2004	FINANCIAL PLAN FOR FY 2005	BUDGET REQUEST FOR FY 2006
New Budget Authority	19,444*	20,106 **	22,032
Obligations	21,860	20,615	22,277
Outlays	20,937	20,202	21,832

* $19,559,000 appropriation: $115,398 rescission included in FY 2004 Omnibus Appropriations Bill.
** $20,268,000 Appropriation: $162,144 rescission included in FY 2005 Omnibus Appropriations Bill.

Enabling Statute:

National Defense Authorization Act, Fiscal Year 1989 (Pub. L. 100-456, September 29, 1988), amended the Atomic Energy Act of 1954 (42 U.S.C. 2286 et seq.) by adding new Chapter 21– Defense Nuclear Facilities Safety Board,

As Amended by:

National Defense Authorization Act for Fiscal Year 1991
(Pub. L. 101-510, November 5, 1990),

National Defense Authorization Act for Fiscal Years 1992 and 1993 (Pub. L. 102-190, December 5, 1991),

Energy Policy Act of 1992 (P.L. 102-486-Oct. 24, 1992), and National Defense Authorization Act for Fiscal Year 1994 (Pub. L. 103-160, November 30, 1993),

Federal Reports Elimination Act of 1998 (P.L. 105-362, November 10, 1998) and National Defense Authorization Act Fiscal Year 2001 (Pub. L. 106-398, October 30, 2000).

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PERSONNEL SUMMARY

	FY 2004 ACTUAL	FY 2005 FINANCIAL PLAN	FY 2006 BUDGET REQUEST
Statutory Personnel Ceiling: (FTE's) [1/]	150	150	150
FTE Usage [2/]	97	100	100
Board Members & Permanent Employees at End of Fiscal Year	97	100	100

1/ National Defense Authorization Act for FY 1992 and FY 1993, Pub. L. 102-190, raised the Board's statutory employee ceiling from 100 to 150 full-time staff to accommodate mandated additional nuclear weapons oversight responsibilities. This statutory employment ceiling does not include Board Members, who by virtue of the Board's enabling legislation may hire up to the equivalent of 150 full-time employees. See 42 U.S.C. § 2286b(b)(1)(A).

2/ Includes five full-time Board Members appointed by the President, by and with the advice and consent of the Senate.

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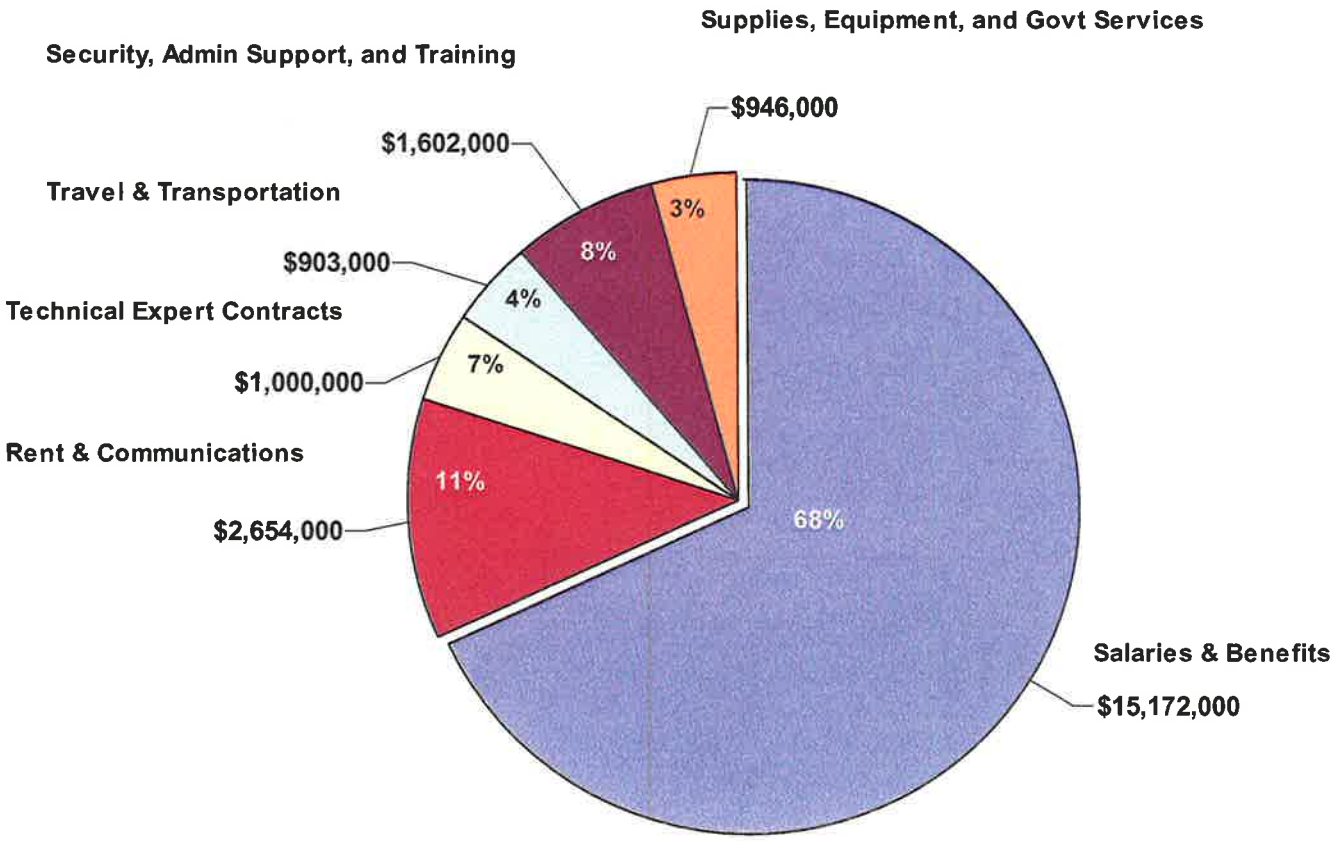
PROPOSED APPROPRIATION LANGUAGE

SALARIES AND EXPENSES

For necessary expenses of the Defense Nuclear Facilities Safety Board in carrying out activities authorized by the Atomic Energy Act of 1954, as amended by Public Law 100-456, section 1441, $22,032,000 to remain available until expended. [*Energy and Water Development Appropriations Act, 2005*]

FY 2006 Total Projected Obligations = $22,277,000



Budget Request Summary

The Board's FY 2006 budget request for $22,032,000 and 100 FTEs includes funding for several major Board safety oversight requirements, as well as new statutory reporting requirements requiring significant expenditures. A brief description of each requirement and associated funding/FTE request follows:

	New Budget Authority	FTEs	Page Ref.
Baseline - FY 2005 Congressional Budget Request Appropriation without rescission	$20,268,000	100	9, 10
Funding to pay for the FY 2006 impact of civilian pay raises effective in January 2002, 2003, and 2004. [Note: the civilian pay raises enacted into law exceeded the President's request by a total of 5.26 percent—includes impact on employee benefits.]	$670,000		
Funding for full impact of FY 2005 civilian pay raise in FY 2006. [Note: this amount is the difference between the 1.5% pay increase included in the President's Budget and the actual 3.5% pay increase—includes impact on employee benefits.]	$280,000		10
Funding for the proposed 2.3% civilian pay raise effective in January 2006. [Note: budget projection based on paying additional salaries and benefits for nine months in FY 2006—includes impact on employee	$164,000		10
Funding for new statutory reporting requirements: **The Accountability of Tax Dollars Act of 2002 and the Federal Information Security Management Act** [Note: OMB has issued extensive audit instructions for agencies to comply with these Acts. A private CPA firm and NIST have been contracted to perform the required audits.]	$100,000		9

	New Budget Authority	FTEs	Page Ref.
Office space lease for DNFSB Washington, DC Headquarters Current GSA lease will expire on March 6, 2006. Based on extensive discussions with GSA, the DNFSB believes that the most cost-effective option is to remain at its existing location with existing floor plans and no build-out. GSA rent estimate is $2.8 million per year for a 10 year lease, approximately $10 per sq ft more than the current 1995 lease rate. Rent increase for FY 2006 assumes 5 months at the current lease rate and 7 months at GSA estimate for a new lease rate. [Note: this option assumes that existing landlord offers a reasonable rent comparable to current market rates.]	$550,000		11
Total Cost of New Initiatives Included in FY 2006 Budget Request.	**$22,032,000**	**100**	

2. EXECUTIVE SUMMARY

The Defense Nuclear Facilities Safety Board's (Board) Fiscal Year 2006 Budget Request is for $22.032 million in new budget authority and 100 full-time equivalent staff years. The requested increase in funds and associated FTE's is necessary if the Board is to continue its vital health and safety oversight role with its unique scientific and technical expertise.

The Board plays a key role in maintaining the future viability of this Nation's nuclear deterrent capability by:

- ensuring that the health and safety of the public and workers at the Department of Energy's (DOE) defense nuclear facilities located throughout the United States are adequately protected, as DOE attempts to maintain readiness of the nuclear arsenal, dismantle surplus weapons, dispose of excess radioactive materials, clean up surplus defense facilities, and construct 25 new facilities;

- enhancing the safety and security at our Country's most sensitive defense nuclear facilities when hazardous nuclear materials and components are placed in more secure and stable storage configurations as a direct result of the Board's oversight operations; and,

- denying terrorists potential targets and sources of material for terror activities with the early identification of health and safety vulnerabilities, allowing the Secretary of Energy to address problems before they become national catastrophes.

The fiscal challenges facing the Board in FY 2005 and FY 2006 will weigh heavily on the Board's future ability to conduct viable oversight operations with a growing workload. To meet operating expenses in FY 2004, the Board had to use $1.6 million or 66 percent of its emergency funds. As will be fully discussed later in our budget request, the ability of the Board to continue operations in FY 2006 is directly dependent on the willingness of the Administration and the Congress to fully fund the Board's budget needs which have been heavily impacted by nondiscretionary cost increases. For example, nearly 70 percent of the Board's budget is currently dedicated to paying the salaries and benefits for 95 staff and five full-time Board Members. The financial impact of Federal pay raises approved by the Congress that have exceeded the amount requested in the President's budgets for FY 2002 through FY 2005 now exceeds $1 million annually.

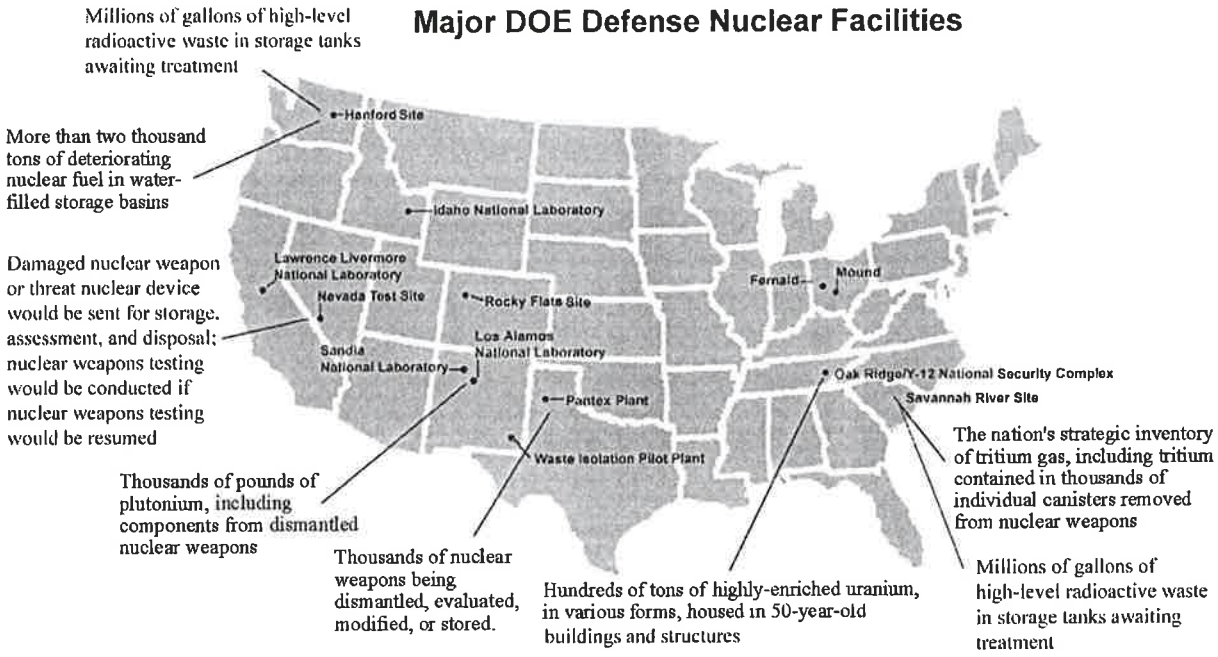
The Board also has been pressed to keep pace with the significant increase in new defense nuclear facilities in the design and construction phase. DOE has 25 new design and construction projects currently underway or planned for the near future. In particular, the design and construction reviews of the $6 billion Waste Treatment Plant (WTP) at Hanford in Washington

have made substantial demands on the Board's technical oversight resources in speciality skill areas such as seismic engineering of structures, geotechnical reviews, concrete chemistry, systems engineering, and hazard analysis. This project is critically important for a successful cleanup of Hanford. The Secretary of Energy recently informed the Congress that the Department relies heavily on the Board to ensure that safety features are incorporated in the WTP design, based on extensive reviews by the Board. 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.

Considering that the WTP is the largest and most complex nuclear design and construction effort in the Nation, it would be inexcusable to overlook or ignore safety issues that could prevent its future operation.

The Risks

The fact that the DOE nuclear weapons program remains a technically challenging and hazardous operation cannot be overemphasized, as the very nature of DOE's defense nuclear mission presents unique hazards. The Board conducts its oversight of DOE in order to reduce the risks that exist in the defense nuclear complex to the greatest extent possible. The following map of major DOE defense nuclear facilities and sites includes a few examples of the types of hazardous materials and operations of concern to the Board:



Unlike commercial nuclear facilities, DOE's nuclear weapons stockpile stewardship and management operations conducted at facilities such as the Pantex Plant in Texas and the Los Alamos National Laboratory in New Mexico are unique in that they include nuclear explosive activities and experiments involving collocated high explosives and nuclear material. The risks at these defense nuclear facilities are not solely a function of the quantities of nuclear material present and associated criticality safety concerns, but more importantly, the material processes involved includes the potential for explosive dispersal of radioactive materials or inadvertent nuclear detonation.

Tons of radioactive and toxic materials exist throughout the defense nuclear complex, and there are many pathways by which these hazards might be released, creating risks to the workers and the public. Consequently, the operation of many of DOE's defense nuclear facilities can pose significant hazards to the environment, the public, and the workers. Most of the facilities in the complex were constructed many years ago and are deteriorating as they age. The integrity of facilities or structures that confine hazardous materials can be threatened by earthquakes, extreme winds, floods, lightning, and other such natural phenomena.

Other potential release mechanisms include inadequate safety controls in new and old facility designs, human errors, equipment malfunctions, chemical reactions, fire, detonation of explosives, and inadvertent nuclear criticality events. Nuclear-related accidents in other countries underscore the significance of the risks in the DOE nuclear weapons operations. For example, on September 30, 1999, a nuclear criticality accident occurred at nuclear fuel processing plant at Tokaimura, Japan. The accident occurred due to human error, serious breaches of nuclear material safety principles, and a mind-set that a criticality accident was incredible. The accident resulted in severe overdoses to three workers, two of whom have died. There have been no criticality accidents in the United States since 1978. However, many DOE facilities contain sufficient amounts of fissionable material such that the risk of an accidental criticality exists and must be controlled.

Also, unpredictable chemical reactions in materials used extensively in defense nuclear work have resulted in several accidents. In 1957, a liquid radioactive waste storage tank exploded at the Mayak, Russia, nuclear complex, contaminating an area equal to the size of New Jersey. It is estimated that this nuclear accident released twice the amount of curies of the Chernobyl reactor accident and forced the evacuation of 11,000 people. The DOE defense nuclear complex includes millions of gallons of radioactive liquid waste which represents a source of hazard that must be addressed.

Management & Policy Overview

The Board believes that identifying potential accident conditions and mitigating their consequences is very important for risk management. Safety is assured by working to understand and reduce the likelihood of events that are adverse to safety and by limiting the consequence of events if they do occur. In addition, safety is assured through robust systems that use multiple layers of protection such that no single layer is depended upon to ensure safety. This concept is called "defense in depth."

Considering the scope of the Board's oversight responsibilities and the risks involved, the Board must function as an oversight organization comprised of technical experts that can quickly recognize problems in the hundreds of hazardous operations conducted daily throughout the DOE defense nuclear complex. Safety oversight activities are prioritized predominantly on the basis of risks to the public and the workers; the types and quantities of nuclear and hazardous material at risk; and the process and setting of the operations involved. Assigning review priorities based on perceived risk levels is a continual process influenced by the technical expertise of the Board Members, as well as by reports from the Board's site representatives, staff issue papers, site visits, implementation plans for the Board's recommendations, responses to reporting requirements, correspondence from workers at DOE sites, testimony from public hearings and meetings, and Congressional inquiries. The Board's outcome measure of successful oversight operations is the early identification of health and safety issues, long before these issues become significant problems and potentially, accidents that could threaten public health and safety and the continued viability of DOE's nuclear weapons and cleanup missions.

The means for an effective Board 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 has asked the Board to do. After years of careful recruiting and selection, the Board'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 have technical master's degrees, and approximately 28 percent have doctoral degrees. Because the Board's health and safety Recommendations and other advisories to the Secretary of Energy are based on in-depth technical information and detailed safety analyses, the recruitment and retention of scientific and technical staff members with outstanding qualifications continues to be critical to the successful accomplishment of the Board's mission.

As an oversight organization comprised of technical experts, the Board must plan for upcoming staff retirements that will reduce our technical capabilities if action is not taken soon. More than 16 percent of the Board's technical staff and 40 percent of our Senior Executives are eligible for regular retirement today. In FY 2006, the number of technical staff eligible for retirement rises to 22 percent of our technical workforce.

To address the expected loss of technical staff capability, the Board developed and previously implemented a three-year Professional Development Program (PDP). This recruitment and development program brings entry-level technical talent into professional positions within the Board. 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.

Unfortunately, the Board was forced to suspend its PDP program in FY 2004 due to a serious shortfall in overall funding for the Board, and a decrease in the Board's FTE ceiling to 100 that prevents hiring new staff until an actual vacancy occurs. As staff vacancies occur, the Board will attempt to re-institute this succession planning effort in FY 2006 to ensure that qualified scientists and engineers are hired and trained to perform this critical oversight mission.

Major Health and Safety Oversight Initiatives

Oversight of New DOE Design and Construction Projects

The Board is required by law to review the design and construction of projects to ensure the safety of the public and workers is addressed early in the design process. In FY 2006, the Board will continue to expend considerable resources to review the ongoing design effort as well as the construction activities at 25 new DOE defense nuclear facilities currently underway or planned for the near future. (See page 39, Nuclear Facilities Design & Infrastructure for a full discussion of these projects.) The following table provides an informal rating using three project assessment characteristics for each of these 25 projects:

1. Significance = overall importance of the facility to the mission of the complex;

2. Complexity = an assessment of the difficulty in successfully implementing the design; and,

3. Risk = an assessment of programmatic risk and safety risk for the facility.

NEW DOE DESIGN & CONSTRUCTION PROJECTS

	RATING		
	SIGNIFICANCE	COMPLEXITY	RISK
HIGH	19	9	11
MODERATE	6	9	9

The Board plans to concentrate its oversight attention on the projects with high risk, significance, and complexity. One prominent example of a high risk, new facility undergoing both design and construction is the $6 billion Waste Treatment Plant (WTP) in Richland, Washington. The WTP project consists of three major nuclear facilities to pretreat and vitrify high-level waste stored in underground tanks at Hanford. This project has evolved from a facility designed to treat only 10 percent of the tank waste at Hanford to one that can process all of the high-level waste inventory from the underground tanks by 2028.

WTP is a complex, high risk program that is constantly changing design and construction parameters and will require more than 15 years to complete. The design and construction reviews conducted by the Board on WTP and other new DOE facilities are resource intensive and time consuming, but are key in preventing safety flaws in design and construction that could render a newly constructed facility unusable. The Board plans to use technical contract funds in FY 2006 to obtain highly specialized skills in areas such as seismic engineering of structures, geotechnical reviews, concrete chemistry, systems engineering, and hazard analysis that are critical to performing the technical oversight reviews of new DOE projects.

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

The Board will also require additional structural, mechanical engineering expertise to evaluate the design, selection, and installation of safety related mechanical systems such as ventilation systems, process piping, pumps and valves, and to evaluate technical issues that continue to evolve such as erosion and corrosion estimates and limits, black cell design issues and melter design.

The WTP Safety Analysis is the largest and most complex analysis reviewed by the Board in its history. The review of this key safety document is a daunting task that continues to expend extensive Board resources. It is a critical task that must be performed in a timely manner to ensure all the hazards are identified and appropriate engineered safety controls are developed early in the design process, reducing the cost impact of changes later in the design process.

Finally, the Board also requires additional chemical process and nuclear waste vitrification expertise to provide technical oversight of the complex WTP processes. The need for this expertise is also expanding due to the addition of other new projects in the DOE complex such as the Salt Waste Processing Facility and the Plutonium Disposition and Conversion Facility at the Savannah River Site.

Safety of Nuclear Weapon Activities

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

To effectively oversee the health and safety issues and maintain the pace of this expanded weapons program, the Board will need to augment its technical staff with subject matter experts and field site representatives, as well as contract for unique specialized technical expertise (e.g., in-depth knowledge of a particular weapon design). In FY 2004, the Board established a site office at the Lawrence Livermore National Laboratory, and assigned additional site representatives to monitor nuclear weapon-related activities at the Pantex Plant (Texas), the Oak Ridge Y-12 National Security Complex (Tennessee), and the Los Alamos National Laboratory (New Mexico).

DOE will be finalizing testing and start-up of new tritium processing facilities at the Savannah River Site in FY 2006. The new Tritium Extraction Facility will involve highly radioactive tritium producing burnable absorber rods that have been irradiated in a commercial reactor. Some of the processes used at the Tritium Extraction Facility will be new and others will involve operations not conducted at the tritium processing facilities for more than a decade. Because the hazards of radioactive tritium gas are different than the hazards at most other DOE defense nuclear facilities, the Board will need to devote substantial, specialized technical expertise to oversee the start-up, testing, and initial operation of these activities to ensure safety.

In FY 2006, the Board plans to focus additional technical oversight on nuclear explosive operations. The Board's technical staff members with this knowledge and background are currently fully occupied. Additional expertise may be required in the areas of high explosives (particularly with respect to high explosives reaction in abnormal environments such as fires or drops) and nuclear weapon design, production, and testing.

The dominant accident in the nuclear weapons complex is an inadvertent nuclear detonation at either the Pantex Plant during nuclear explosive operations or at the Nevada Test Site while working on a damaged nuclear weapon or an improvised nuclear device. The Board must provide comprehensive and effective oversight to ensure an accident with the absolutely unacceptable consequence of a nuclear detonation never occurs.

It is anticipated that the current operational tempo in nuclear explosive operations at the Pantex Plant will likely increase due to increased requirements to surveil our aging stockpile, particularly in the absence of underground testing, and pressure to dismantle our retired nuclear weapons as we draw down our nuclear weapons stockpile. In addition, NNSA plans to begin nuclear explosive operations for the first time ever at the Device Assembly Facility at the Nevada Test Site to support dismantlement of retired weapons. Oversight of this particular activity will require significant staff resources.

In addition, the Board has been urging DOE to develop a capability at NTS to disposition a damaged nuclear weapon or improvised nuclear devise. While a significant amount of progress has been made, there is still much work to be done. Additionally, there is always the possibility of a national crisis which would require a return to underground testing at NTS. In fact, there is a Presidential requirement to maintain the capability to do this with 18 months. Finally, the

Nation's capability to perform nuclear criticality experiments is being moved from LANL to NTS over the next few years.

Special Study of Facilities for Storage of Plutonium and Plutonium Materials at the Savannah River Site

In the FY 2003 *National Defense Authorization Act*, Congress tasked the Board to conduct a special study of the adequacy of K-Area Materials Storage (KAMS) facility and related support facilities such as Building 235-F, at the Savannah River Site (SRS) in South Carolina, and submit a report to Congress and the Secretary of Energy not later than one year after the date of the enactment of the Act. The required study was completed in December 2003 and provided to the Congress and the Secretary of Energy. In this report the Board made nine proposals it considered appropriate to enhance safety, reliability, and functionality of the plutonium storage facilities at SRS.

Congress also directed the Board to submit a yearly report on the actions taken by the Secretary of Energy in response to the Board's proposals. This followup effort requires a continuing evaluation of the plans for plutonium storage at SRS, as well as an independent assessment of the safety analysis and hazards including the specified safety-related controls for these hazards. Further assessment of modifications to the safety-related systems and components will be necessary to fully review the Secretary's actions to ensure safe, reliable storage of the Nation's excess plutonium until a permanent disposition path is determined. As currently planned, plutonium could be stored in 50-year old facilities for another 20 years. It is imperative that the storage facilities provide the necessary protection for the public, workers, and environment.

These assessments will require an extensive commitment of the Board's staff resources. Several of the assessments will require that the Board obtain specific outside expertise (e.g., a geotechnical expert). The Board's effort to continue the needed assessments is estimated to require 1900 technical staff hours, 350 outside expert hours, and ten on-site reviews. Accordingly, it is estimated that the Board will expend approximately $300,000 in FY 2006 to continue its efforts on this important, Congressionally mandated study.

Administrative Funding Needs

The Board's budget request also includes funding to respond to several non-discretionary requirements that are resource intensive and are beyond the capabilities of the Board to absorb or perform without additional funds. An explanation of each requirement and associated funding impact is discussed as follows:

Accountability of Tax Dollars Act & Federal Information Security Management Act (FISMA)

The Accountability of Tax Dollars Act of 2002 requires all agencies, including the Board, to prepare audited financial statements. OMB Bulletin No. 01-09 now requires the Board to combine the program performance report with the financial statement and accountability report. As a small agency, the Board must rely on an outside auditor to conduct an annual audit of the Board's finances and prepare the required opinion as to whether the Board's financial statements are presented fairly in accordance with generally accepted accounting principles. Due to the cost of such audits, the Board requested and received an OMB waiver from these requirements for FY 2003.

For FY 2004, the Board has contracted with a private CPA firm to conduct the required independent financial audit. The cost for this audit is $80,000, an amount not included in our FY 2004 or FY 2005 appropriation request. Since this reporting requirement is an annual event, the Board requests additional funding of $80,000 in the FY 2006 budget to contract for the required audit services, and $10,000 to pay GSA and the Bureau of Public Debt for the cost of new audit requirements for their fee-for-service accounting and payroll support.

The Federal Information Security Management Act (FISMA) requires an independent evaluation of each agency's information technology (IT) security program. Due to our small size, the Board has contracted with NIST to review the Board's IT security program and to prepare a report based on their independent evaluation on our strengths and weaknesses in this area. To comply with the reporting requirements established by OMB, the Board will forward a copy of the NIST assessment and a list of commitments for any required corrective actions to OMB. The cost for this NIST review in FY 2004 is $10,000. Since this IT security review is an annual requirement, the Board requests that an additional $10,000 be included in our FY 2006 budget.

Fully Fund the Salaries and Benefits Account For FY 2006

During the past three fiscal years, the enacted civilian pay raises have exceeded the pay raise factors that were included in the President's budget requests. Since an agency's budget request for salary and benefit funds includes an allowance for the President's proposed pay increase, any increase in this pay raise above the President's request must be absorbed by each agency as the funding authorized and appropriated for each agency is not adjusted to reflect the actual pay raise.

The chart below shows the financial impact of Congressionally enhanced pay increases above the amount requested by the President. For the Board, the enacted and proposed pay increases for FY 2002 through FY 2005 amount to a $955,188 unfunded mandate. To put the severity of this cumulative funding shortfall in perspective, the pay increases above the President's budget requests amount to almost ten staff positions for the Board. As a small agency with a FY 2005 budget of $20.1 million to support 100 employees (including five Board Members), the Board is unable to absorb pay increases of this magnitude without a severe staff reduction.

YEAR	President's Budget Request	Actual Pay Factors (w /Locality Pay) (DC)	Dollar Impact	Benefits	Total Impact
Jan-01	3.80%	3.80%	$0	$0	$0
Jan-02	3.60%	4.77%	$111,169	$28,904	$140,072
Jan-03	2.60%	4.27%	$163,579	$42,530	$206,109
Jan-04	2.00%	4.42%	$257,165	$66,863	$324,028
Jan-05	1.50%	3.50%	$226,174	$58,805	$284,979
			$758,086	**$197,102**	**$955,188 5 year impact**

Since the percentage increase in base pay is cumulative and must be paid for in future years, an increase in our appropriation is needed to compensate for the under funding of our salary and benefits accounts. With nearly 70 percent of the Board's budget dedicated to paying for staff salaries and benefits, the financial impact of these unfunded cost-of-living pay increases is especially severe. The difference between the President's proposed civilian pay increases and the enacted pay increases equals 5.26 percent for FY 2002 through FY 2004. Therefore, the Board is requesting $670,000 to pay for the impact of these three pay increases in FY 2006.

The Board also needs additional funding to help pay for the out-year impacts of the projected 3.5 and 2.3 percent increases in January 2005 and January 2006 respectively. An additional $280,000 is needed to fund the full impact of the FY 2005 civilian pay raise at the enacted 3.5 percent level for FY 2006, as well as an additional $164,000 to fund the President's proposed FY 2006 civilian pay raise of 2.3 percent effective in January 2006.

Without full funding of these accounts, the Board has no alternative but to reduce staff and curtail operations in the field—the backbone of our health and safety oversight program. The Board is currently operating with only 93 staff and five full-time Board Members (65 percent of its statutory employment ceiling). Recruitment and retention of scientific and technical staff with outstanding qualifications will continue to be critical to the successful accomplishment of the Board's mission.

Expiration of the Board's Office Space Lease

The current GSA lease for office space in Washington, DC, will expire on March 6, 2006. The Board has been located at its current office facility since 1990, and has maintained and periodically upgraded the office support architecture (e.g., telecommunications, security equipment, video teleconferencing) as new technology became necessary. In addition, the physical security of the building was upgraded substantially as a result of the September 11 terrorist attacks. After extensive consultations with GSA leasing officials, the Board has estimated the costs for two office space scenarios, the details of which can be reviewed at the Financial Tables tab, pages 73 and 74.

Option 1 is for GSA to attempt to negotiate a new lease for the Board at its current location. Since the Board has already incurred considerable expenses during the past 15 years installing the necessary office facilities and security modifications for its oversight mission involving classified DOE nuclear weapons information, staying at our existing location is the least cost option. Moreover, since the Board anticipates no changes to the rentable area and no further build out or construction is necessary to the current space, a significant cost avoidance could be realized if GSA can negotiate a new lease with the building owner at a fair and reasonable price. Under this option, GSA advises that the Board should expect to pay approximately $2.8 million per year for this office space in the Washington, DC market, with the space accepted in its current configuration "as is." This annual rent estimate is approximately $850,000 higher that the FY 2005 rent estimate, as the current lease was negotiated in 1995 when the local commercial real estate market was depressed. For FY 2006, the total rent request is $2.5 million, assuming five months at the current lease rate and seven months at the GSA estimate for a new lease rate.

Option 2, as analyzed by the Board and GSA, would involve a relocation of the Board's staff and equipment to new office space that would be selected based on an open market solicitation. This is the least favorable alternative due to the high estimated cost for several reasons. First, there is limited commercial space available for GSA leasing at this time that is in their competitive price range. Consequently, GSA estimated that the Board would pay approximately $3,450,000 per year for comparable office space in this market, as the lessor's costs to build out new space would be amortized over the term of the lease and add considerable expense to the annual rent. Second, the Board would incur first-year move expenses totaling approximately $2.8 million to pay for the physical move, telecommunications installation, and general security replication.

The Board has strongly recommended that GSA pursue Option 1—Remain at our existing location if possible—since a relocation is cost prohibitive and would seriously disrupt Board operations, and requests funds to support this least-cost option.

The Bottom Line

The Defense Nuclear Facilities Safety Board has reached a crossroad in the performance of its vital health and safety oversight mission. During the past four years, the combination of non-discretionary annual cost-of-living pay increases and across-the-board appropriation rescissions have decimated the Board's finances to the point where the Board was forced to use more than $1.6 million or 66 percent of our emergency funds to pay for operations in FY 2004. In particular, total obligations for FY 2004 to support the Board's operations exceeded our FY 2004 appropriation by $2.4 million or 12 percent. Additional funding of $1.8 million is needed in FY 2006 to meet the Board's statutory health and safety oversight workload and the associated financial needs of the Board.

The Board's role in providing independent oversight of health and safety issues throughout the DOE defense nuclear complex for the Secretary of Energy, the Administration, and the Congress places intense pressure on our ability to provide timely and accurate assessments. The Board is the last line of defense in preventing costly mistakes and tragic accidents from occurring in very complex, dangerous programs. Having to abandon or extensively rebuild a newly constructed facility such as the Waste Treatment Plant in Hanford, costing billion of dollars, due to an undiagnosed safety flaw in the design or construction process is inexcusable. An accidental detonation of a nuclear weapon during the evaluation, maintenance, or dismantlement process, resulting in catastrophic impacts on lives and property, as well as on our Nation's nuclear deterrent capability is unimaginable. The primary purpose for the Board's existence is to significantly reduce the chances of failed programs and devastating accidents from becoming a reality.

The Board's budget request of $22.032 million constitutes a wise investment toward improving the safety and reliability of the vital defense activities conducted at DOE's defense nuclear facilities, at a small fraction of the potential economic and health costs of a nuclear accident. We ask for your support of the full amount requested.

Annual Performance Budgeting Objectives for FY 2006

The Defense Nuclear Facilities Safety Board (Board) is an independent Executive Branch agency charged by statute with a broad mission of providing technical health and safety oversight of the Department of Energy's (DOE) defense nuclear facilities and activities.

The Board's Strategic Plan presents the four major performance goals, summarized below, from which annual performance objectives are derived.

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.

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

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.

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

Each of these four performance goals is reviewed in the sections that follow.

To facilitate strategic management, the Board has organized its technical staff into four groups. The Technical Lead of each group is assigned responsibility for one of the four performance goals in the strategic plan, and for executing the performance objectives associated with that goal. As required by the Office of Management and Budget (OMB) guidance governing compliance with the Government Performance and Results Act of 1993, the Board has produced measurable performance goals for Fiscal Year (FY) 2005 and FY 2006 that, when executed, will demonstrate continued progress toward the Board's goals. These annual performance objectives and measures establish projected levels of performance and reflect the nature of the Board's independent oversight function.

The Board's objectives as outlined in its strategic plan address multi-year efforts and encompass a broad spectrum of technical areas relevant to the safety of DOE's defense nuclear mission. The Board's *Annual Performance Plan for FY 2006* identifies annual performance objectives that consist of technical issues to be evaluated in support of the Board's strategic plan,

and the identification of specific candidate topics for these reviews. An outcome measure for each objective is described as part of the discussion of each annual performance goal. Assessments of the outcome associated with each annual performance goal are provided in the Board's annual performance reports.

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

- DOE's acknowledgment that a safety enhancement is needed after the Board communicates the results of its technical reviews;

- DOE's subsequent development of appropriate corrective actions to resolve the Board-identified safety issue; and

- 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 correspondence of DOE and its defense nuclear contractors, Board correspondence, staff reports, DOE and contractor public testimony, and other sources. Past reporting (see the Board's Annual Reports to Congress) of Board-identified issues and associated DOE responses demonstrates that the Board has a sustained, clear, and substantial positive impact on the safety of DOE defense nuclear activities.

Because of the variability of DOE's plans and schedules, some candidate areas identified in the Board's annual performance plan may not be addressed during a performance period. However, the Board's annual performance report will document that an equivalent level of effort was expended in support of the strategic objective, and describe the alternative area that was selected for review.

To facilitate an integrated review, the tables in the four major performance goals that follow are formatted to show the flow-through from the general objective set forth in the Board's Strategic Plan to the specific Annual Performance Objectives for FY 2005 and FY 2006. To place this planning information in context, the performance goals are followed by examples of the Board's accomplishments during the years FY 2001 through FY 2004, as required by OMB's guidance on preparing and submitting a performance budget.

The examples provided in the four major performance goals do not represent the entire scope of progress made on the FY 2004 Performance Goals. A comprehensive assessment of progress during Calendar Year (CY) 2003 appears in the Board's *Fourteenth Annual Report to Congress*. The Board's *Fifteenth Annual Report to Congress*, due for publication in early 2005, will cover accomplishments during CY 2004. The Board's annual performance reports are available for review on the Internet at www.dnfsb.gov under the Public Documents/Reports to Congress research headings.

3. PERFORMANCE GOAL 1: NUCLEAR WEAPON OPERATIONS

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

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

SUMMARY: DOE actions to increase nuclear weapon activities at Pantex, in response to new stockpile reduction initiatives and life extension programs, will add to the Board's oversight workload in Fiscal Year 2006. At the same time, the potential for accidents during transition period at the national laboratories due to potential contract changes and the relocation of hazardous missions to the Nevada Test Site, will increase demands on the Board's safety oversight. Key areas of oversight for the Board in Fiscal Year 2006 will include:

- *Nuclear Explosive Operations* —DOE's operational tempo will likely be higher than it currently is due to increased requirements to evaluate our aging stockpile, as well pressure to dismantle our retired weapons as we draw down our nuclear weapons stockpile.

- *Nevada Test Site Nuclear Activities*—There is significant work to be done for DOE to develop a capability at NTS to disposition a damaged nuclear weapon or improvised nuclear devise. In addition, it is likely that NNSA will begin nuclear explosive operations for the first time ever at the Device Assembly Facility at the Nevada Test Site to support dismantling of retired weapons. Finally, the Nation's single capability to perform nuclear criticality experiments is being moved from LANL to NTS. The Board will be required to assess the safety of criticality reactor operations at NTS in FY 2006.

- *Safety Upgrades at the National Laboratories*—Recent safety related events led to the complete shutdown of LANL. The contractor anticipates identifying thousands of safety related deficiencies or findings, during its restart activities which will take NNSA and LANL years to resolve. In addition, it is anticipated that the upcoming competition of the operating LANL contract, as well as LLNL, will result in additional safety oversight requirements at the laboratories as a result of the discovery of additional safety 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.

FY 2006 Performance Objectives

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

The Board and its staff will conduct assessments of DOE's efforts to develop and implement safety management systems for stockpile management activities. The Board's evaluations will be split between DOE efforts to develop safety systems (e.g., system and process designs, safety bases, control schemes, and administrative programs) and DOE efforts to implement 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 Board and 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, Y-12 National Security Complex, or NTS that start in 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.

FY 2005 Performance Objectives

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

The Board and its staff will conduct assessments of DOE's efforts to develop and implement safety management systems for stockpile management activities. The Board's evaluations will be split between DOE efforts to develop safety systems (e.g., system and process designs, safety bases, control schemes, and administrative programs) and DOE efforts to implement 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 Board and 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 2005.

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

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

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

Readiness to Dispose of a Damaged Nuclear Weapon. The Board has consistently highlighted to DOE, the need to develop the programs and infrastructure at NTS necessary to safely dispose of a damaged nuclear weapon or improvised nuclear device. In 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 Board noted that the safety-class lightning protection system at LANL's Weapons Engineering and Tritium Facility (WETF) did not appear to provide adequate lightning protection for the facility. Subsequently, DOE has directed LANL to require that all hazard and accident analysis scenarios be re-evaluated. In addition, LANL is required to upgrade fire barriers and package material-at-risk in approved containers.

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

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

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

Examples of FY 2004 Accomplishments

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

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

Improvements in Quality Assurance related to the Tooling Program at Pantex. In a June 18, 2004-letter, the Board expressed concern that there continue to be serious weaknesses in the program to design and fabricate tools for nuclear explosive operations at Pantex. Additionally, the Board noted that an effective quality assurance program is essential to the safe design, fabrication, procurement, inspection, and maintenance of special tooling. The Board has requested that NNSA conduct a comprehensive review of quality assurance as it affects the tooling program at the Pantex Plant. NNSA 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 Board's staff reviewed the hoisting and rigging programs at the Savannah River Site, the Pantex Plant, the Nevada Test Site, and Sandia National Laboratory. In letters dated July 10, 2003 and January 21, 2004, the Board expressed concerns regarding the maintenance of hoisting equipment, the safety classification of hoisting, vendor communication, and training for emergency scenarios. The Board also provided DOE substantive comments for the revision of DOE standard 1090, "Hoisting and Rigging." The safety of hoisting and rigging operations across the complex has improved, in particular the hoisting and rigging program at the Pantex Plant.

W78 Operations at Pantex. The Board has been urging DOE to improve the safety of weapons-related work at the Pantex Plant since it issued Recommendation 98-2, *Safety Management at the Pantex Plant.* Principle among the Board's recommendations was that DOE simplify and expedite its process for re-engineering nuclear explosive processes at Pantex such that the attendant safety improvements could be put in place sooner. In FY 2004, DOE completed the start-up of the Seamless Safety for the 21st Century (SS-21) W78 Disassembly & 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 Board identified a number of deficiencies in various processes at the Pantex Plant that led to the attempted dismantlement of a damaged unit in a manner that was not intended, that was not adequately reviewed, and may not have incorporated adequate safety measures. As a result of this incident, Pantex has made improvements in the training of production technicians, in the conduct of unreviewed safety question evaluations, in the performance of nuclear explosive safety evaluations, and in the requirements for involvement of process engineers in certain types of operations.

Y-12 Building 9212 B-1 Wing Fire Protection. The Board identified concerns to NNSA Headquarters regarding the adequacy of fire protection in the B-1 wing of Building 9212 at Y-12. Following a performance-based review, YSO 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.

Examples of FY 2004 Accomplishments

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

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

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

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

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

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 Board briefed National Nuclear Security Administration (NNSA) management on several occasions regarding efforts to restart the W84 disassembly and inspection operations without an adequate authorization basis. The Board raised numerous potential safety issues, which resulted in NNSA conducting an internal study that ultimately validated the Board'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 Board 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 Board'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 Board 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, NNSA has started to reduce the amount of stored nuclear materials and to standardize fissile material storage containers.

Nuclear Explosive Operations at Pantex. The Board has been urging DOE to improve the safety of weapons-related work at the Pantex Plant since it issued Recommendation 98-2, *Safety Management at the Pantex Plant*. Principle among the Board's recommendations was that DOE simplify and expedite its process for re-engineering nuclear explosive processes at Pantex such that the attendant safety improvements could be put in place 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 Board sent NNSA 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 Board wrote NNSA, 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 Board wrote to DOE expressing concern with the seismic response of Building 12-64. In 2002, NNSA informed the Board 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 NNSA personnel and the Board's staff have identified concerns with analyses that had been completed to address the Board's original concerns. Although NNSA'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 Board urging, DOE ultimately completed the Readiness Assessment Report for Fire Protection, and delivered it to the Board 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 Board continues to urge DOE to expedite the implementation of onsite transportation controls.

NTS Readiness to Dispose of a Damaged Nuclear Weapon. The Board has consistently highlighted to DOE the need to develop the programs and infrastructure at NTS necessary to safely dispose of a damaged nuclear weapon or improvised nuclear device. In FY 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 Board identified deficiencies in LLNL's emergency electrical power system, which did not meet safety-class standards and IEEE codes. As a result of the Board'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 Board noted that the safety-class lightning protection system at LANL's Weapons Engineering and Tritium Facility (WETF) did not appear to provide adequate lightning protection for the facility. In addition, the Board 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 Board 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 Board 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 Board reviewed DOE's assessments and readiness for subcritical experiments, identifying inadequate nuclear safety management programs; inadequate mechanisms for verification of readiness of subcritical experiments and test readiness (should nuclear weapons testing be resumed); and inadequate commitment to improve the readiness review process for subcritical experiments and nuclear weapons testing. In FY 2003, NNSA'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.

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 2002 Accomplishments

Maintenance Improvement Program at Y-12. In 2001, Y-12 responded to Board concerns about overdue and deferred maintenance of safety systems by implementing a maintenance improvement program. In 2002, the Board found that the program did not incorporate certain fundamental requirements, such as integrated scheduling of maintenance and comprehensive tracking of material history and equipment failures. Y-12 has now instituted systematic, scheduled outages at nuclear facilities, while prioritizing and reducing the maintenance backlog.

Material Storage Facilities at Y-12. The Board has highlighted the accumulation of unneeded nuclear materials stored in unsatisfactory configurations at Y-12. During 2002, Y-12 stabilized or disposed of many of the materials, particularly non-Material Access Area legacy items and the uranium inventory in Building 9206.

Chemical Safety at Y-12. Problems with the management of chemicals at Y-12 have been highlighted in extensive correspondence from the Board. In 2002, as a result of the Board's interactions, Y-12 made improvements in the chemical safety program. The site has issued a *Chemical Safety Management Program*, Operational Safety Boards continue to improve, Hazard Surveys are on track for completion, Authorization Basis documents for Chemically Hazardous Facilities have been issued, and the Hazardous Material Inventory System has been upgraded.

Recommendation 99-1. Continuing to respond to Board Recommendation 99-1, *Safe Storage of Fissionable Material called "Pits,"* DOE repackaged its 5000th pit into a robust container suitable for interim storage in July 2002. The associated container surveillance program has also been rejuvenated, with more than half of the surveillance backlog worked off in FY 2002.

Fire Protection at Pantex. In early 2002, LLNL conducted a baseline needs assessment of the Pantex Fire Department, identifying numerous significant safety-related deficiencies. However, the Pantex Plant contractor exhibited reluctance to act on these findings. The Board intervened to emphasize the need for NNSA and its contractor to act promptly to address the deficiencies. As a result, the contractor has placed more emphasis on this issue, and a corrective action plan is being implemented to improve Fire Department readiness.

Deactivation LLNL Heavy Element Facility. The Board reviewed LLNL's plans for deactivation of the Heavy Element Facility, including the removal of nearly 300 radioactive items, some of which pose significant radiological risk. Planning for the project was being approached piecemeal, rather than in a systematic and integrated manner. In March, 2002, the Board informed DOE that comprehensive planning methods, such as those contained in DOE Order 430.1A, *Life Cycle Asset Management*, should be used to better identify hazards and necessary controls, improve sequencing of tasks, and identify repetitive tasks that could be standardized. LLNL is currently working to address this issue.

Readiness to Dispose of a Damaged Nuclear Weapon at NTS. The Board has consistently highlighted to DOE the need to develop the programs and infrastructure at NTS to safely dispose of a damaged nuclear weapon or improvised nuclear device. In FY 2002, DOE responded by upgrading its capabilities to conduct these activities safely, including making further physical improvements to G-tunnel, preparing to develop a safety basis for G-tunnel, and conducting a number of exercises to identify policy, personnel, and procedure requirements and provide training. As a result, DOE has made substantial physical and procedural improvements and provided training to ensure that it will be prepared to safely dispose of a damaged nuclear weapon should the need arise.

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 2001 Accomplishments

Startup of a New Dismantlement Activity at Y-12. The Board identified a number of potentially significant safety issues with the design of a new weapon (secondary) dismantlement process. In response to the Board's concerns, DOE and its contractor redesigned the process to resolve the safety issues.

Restart of the Reduction Process at Y-12. The Board highlighted safety issues related to the design of the reduction process and noted the lack of resolution of safety issues since the failed attempt in November 1999 to restart the reduction process. In response, Y-12 developed an adequate technical basis for the reduction process and successfully restarted the operation in April 2001.

Maintenance at Y-12. The Board identified the need to improve the maintenance work control program at Y-12 and noted a large backlog of overdue or deferred maintenance that could undermine the effectiveness and reliability of safety systems. Y-12 responded by reinstating a requirement for periodic inspections of safety-related equipment and began to implement a maintenance improvement plan.

Material Storage Facilities at Y-12. The Board expressed concern about the degrading physical condition of facilities at Y-12 used to store nuclear material. The Board emphasized its concern that the facilities and containers that store these nuclear materials should provide adequate protection and ensure the health and safety of the workers, the public, and the environment. As a result, material stored in a decrepit building has been transferred to better storage facilities and fire hazards have been substantially reduced.

Recommendation 99-1. In response to Board Recommendation 99-1, *Safe Storage of Fissionable Material called "Pits."* urging DOE to improve the storage environment for plutonium pits, DOE achieved its goal of repackaging 200 pits per month in April 2001. The number of pits repackaged into an inert environment in FY 2001 was more than double that of FY 2000 resulting in the safer storage of plutonium pits.

Lightning Protection at Pantex. During 2001, DOE proposed to relax certain lightning protection controls at Pantex, over the objections of both the design agencies and DOE's Nuclear Explosive Safety Study Group. The Board intervened to emphasize the need for DOE to maintain technically justified controls for all nuclear explosive operations. As a result, DOE retained the controls and the Pantex lightning protection program continues to provide a reduced lightning threat environment with regard to nuclear explosive operations.

Fire Protection at Pantex. The Board concluded that the potential hazards from a fire at Pantex had not been comprehensively and consistently addressed. In response, DOE accelerated replacement of the deteriorating plant-wide fire alarm system and improved the fire hazards analyses that assess the fire risks in the bays and cells.

Nuclear Explosive Program Activities. The Board has been urging DOE to improve the safety of weapons-related work at the Pantex Plant since it issued Recommendation 98-2, *Integrated Safety Management at the Pantex Plant.* Principle among the Board's recommendations was that DOE simplify and expedite its process for re-engineering nuclear explosive processes at Pantex such that the attendant safety improvements could be put in place sooner. In FY 2001, DOE completed the start-up of the Seamless Safety for the 21st Century (SS-21) W76 Disassembly & Inspection Program. This program is now significantly safer and more robust than all of the weapons programs to which the SS-21 process has not yet been fully applied.

Lightning Detection and Warning at LANL. The Board has identified several issues regarding the site-wide requirements for electrical, instrumentation, control, lightning protection and fire protection systems at LANL. In response, DOE revised the LANL Work Smart Standards and implemented several programs to address the Board's issues. In particular, LANL has now documented the adequacy of the lightning protection systems and completed an assessment of the lightning warning detection and alarm system.

Readiness to Dispose of a Damaged Nuclear Weapon at NTS. The Board highlighted to DOE safety-related program and infrastructure problems that may complicate DOE's mission to safely dispose of a damaged nuclear

weapon or improvised nuclear device. In response, and with the Board's assistance, DOE has upgraded its capabilities to conduct these activities safely, including improving G-tunnel and developing its safety basis and conducting a number of exercises that clearly identified further issues to be addressed.

Safety Management at NTS. DOE efforts at the Nevada Test Site in response to Recommendation 95-2 have significantly improved the safety and DOE's oversight of activities at the Nevada Test Site. As a result of Board interactions, work planning, authorization, and control have improved and the DOE facility representative program is developing into an asset for DOE and its contractors.

LANL Special Recovery Line. The Board noted that the Special Recovery Line (SRL) represents the only disposition path for a subset of relatively vulnerable pits currently stored at the Pantex Plant. A lack of funding for SRL had nearly resulted in operations being placed into a cold standby mode. The Board suggested that it would be prudent to stabilize funding for SRL to maintain the ability to dispose of vulnerable pits at Pantex should an acute problem arise there. NNSA has now agreed to maintain the availability of SRL pending the identification of a disposition path for the pits in question.

Fire Protection at LLNL. The Board identified that a building fire alarm system is inadequately designated and maintained to ensure power and control for the room smoke detectors and fire dampers. In response, LLNL acknowledged that the problem increased the probability of malfunction of equipment important to safety and implemented compensatory measures to increase reliability of the fire alarm system. LLNL is also expediting replacement of old system with a new safety-class system.

4. PERFORMANCE GOAL 2: NUCLEAR MATERIAL PROCESSING AND STABILIZATION

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

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

SUMMARY:

The Department of Energy has begun to aggressively pursue acceleration of stabilization and cleanup work at facilities at many of its defense nuclear sites, in some cases in response to Recommendations and other formal correspondence from the Board. Although these activities will ultimately improve the safety posture of the defense nuclear complex, cleanup work is itself hazardous and demands effective safety oversight.

The Board is devoting a significant share of its resources toward oversight of DOE's stabilization and cleanup work, and the demand for such oversight is continuing to increase as additional cleanup projects commence while others remain ongoing. Examples of the most significant new and ongoing projects are summarized below:

High-Level Waste Retrieval and Processing—The Hanford and Savannah River Sites are continuing decades-long projects to retrieve high-level waste from tanks that date as far back as the World War II-era Manhattan Project. At Hanford, retrieval of waste from well over 100 leak-prone single-shell tanks is only now beginning in earnest. In coming years, DOE plans to significantly expand waste retrieval activities, particularly at Hanford, with attendant hazards associated with mobilizing extremely radioactive liquids and sludges, working with old systems and equipment, and working under conditions that frequently are poorly characterized. Safe operation of complex waste concentration and transfer systems is also required once wastes are retrieved into more modern tank farms at these sites. Major new facilities needed to treat and disposition most of the wastes are in various states of design and/or construction and are not yet available. Oversight of retrieval and safe storage operations, as well as of the development, design, and eventual startup and operations of planned treatment facilities will require a substantial share of the Board's resources for the indefinite future.

Facility Decommissioning—The DOE Office of Environmental Management is pursuing accelerated decommissioning of defense nuclear facilities at several sites. In addition to closure activities that are nearing completion at Fernald, Mound, and Rocky Flats, DOE is putting contracts in place to expand this effort to major portions of the Hanford and Savannah River Sites and the Idaho National Engineering and Environmental Laboratory. The transition from an operational or maintenance status to closure activities involves major changes in the type of work performed, the introduction of pressures to meet incentivized milestones for cleanup, and most significantly, a change from a static work environment to a dynamic, often poorly characterized environment in which conditions are constantly changing as cleanup progresses and new hazards are encountered. The Board's experience with recent DOE closure activities, particularly at Rocky Flats and Fernald, has made it clear that these activities pose significant risk to workers and require continued close oversight as long as significant radiological hazards remain.

Plutonium Consolidation, Storage, and Disposition—DOE is planning to relocate essentially all excess plutonium not contained in weapon components to the Savannah River Site for eventual disposition. In December 2003, the Board prepared a report requested by Congress which evaluated the safety aspects of extended storage of plutonium at the Savannah River Site. The Board's report made recommendations aimed at ensuring that DOE properly evaluates its options for providing facilities for storage of these materials at the Savannah River Site, that the storage facilities would provide safe conditions for extended storage of plutonium, and that DOE disposes of unneeded plutonium in a timely manner to minimize the need for continued storage. DOE does not expect to begin disposition of the majority of these materials until 2011. Continued oversight by the Board is needed to evaluate the effectiveness of DOE's response to the recommendations made in the Board's report to Congress and to ensure that a safe approach is taken toward storage of plutonium at the Savannah River Site.

Hanford K-Basin Sludge Cleanup—Retrieval, stabilization, and safe interim storage of the highly radioactive sludge in the K-Basins continues to require substantial safety oversight. DOE did not meet its commitments to the Board for completing this activity, and is presently attempting to develop a process that will lead to safe interim storage of the sludge by 2007. The Board plans to review the designs of the required retrieval, transfer, stabilization, and packaging systems; to perform oversight of the preparations for startup of each of these systems, which have been a historical weakness for the spent fuel project at Hanford; and to assess the safety of operations once they finally begin. Lastly, DOE plans to begin decommissioning and removal of the basin structures in parallel with the sludge cleanup, which will also require safety oversight by the Board.

Nuclear Material Stabilization—Several of the Board's Recommendations to the Secretary of Energy have focused on improving the safety of nuclear materials stored across the DOE defense nuclear complex. As a result, DOE has made great strides in improving storage conditions by either stabilizing and repackaging materials or by disposing of them. However, much remains to be done, primarily at NNSA sites, chiefly LANL. Despite Board Recommendations dating back to 1994, LANL continues to manage a large inventory of nuclear materials that are not in suitable forms or packaging for extended storage. In response to suggestions on the technical approach and continued urging from the Board, LANL now is pursuing an appropriate stabilization and disposition program. This effort is expected to extend until approximately 2010, and will require continued safety oversight by the Board to ensure the work is performed safely and does not languish.

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.

FY 2006 Performance Objectives

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

- Stabilization, packaging, and storage of 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 stabilization/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 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 and disposition 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 leak 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 sludge retrieval, treatment, and storage at the Hanford Site (Recommendations 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 Plant (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 transuranic waste drums 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.

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.

FY 2005 Performance Objectives

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

- Stabilization, packaging, and storage of 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).
- Characterization, stabilization, and packaging of uranium-233 (^{233}U) at Y-12 (Recommendation 97-1).
- 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).
- Testing and operation of high-level waste retrieval and transfer systems at the Hanford Site.
- 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 initial contact-handled and 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.
- 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 ORNL's system for processing ^{233}U (i.e., ^{229}Th extraction) for potential medical applications.
- Decommissioning activities in Building 371 at Rocky Flats Environmental Technology Site (RFETS).
- SRS deactivation activities, including F-Canyon and M-Area facilities.
- Hanford Site decommissioning activities (e.g., planning for decommissioning the Plutonium Finishing Plant, U-Plant, and K-Basins).
- Decommissioning at the Miamisburg Closure Project.
- Decommissioning at the Fernald Closure Project, including operation of the Silos Project facilities.
- Deactivation and decommissioning of the Heavy Element Facility (Building 251) at Lawrence Livermore National Laboratory.

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

Inactive Actinide Materials. The Board evaluated NNSA plans for managing non-programmatic actinide materials stored at LANL, LLNL, SNL, the Pantex Plant, and Y-12. The Board found that NNSA has begun to define and execute adequately its strategy to characterize materials for storage or disposition, to identify which materials fall under this effort, and to analyze and upgrade, where appropriate, material packaging and storage facility conditions. The Board continues to evaluate the approaches taken by each NNSA site, as well as NNSA's programmatic direction.

Surveillance and Monitoring Program for Plutonium Storage. DOE-STD-3013, *Stabilization, Packaging, and Storage of Plutonium-Bearing Materials*, which establishes requirements governing the long-term storage of plutonium metal and oxides, requires a surveillance and monitoring program to verify safe storage parameters. The Surveillance and Monitoring Program managed by the DOE Savannah River Operations Office was established for this purpose, but despite assurances provided last year, DOE again under funded the LANL portion of this effort, thereby jeopardizing verification of safe storage parameters as required by the standard. At the urging of the Board, the Assistant Secretary for Environmental Management restored the funding for this program for fiscal year 2004. The Board also reviewed the scientific and statistical methodology for surveillance of plutonium in storage and provided input that corrected overly optimistic assumptions regarding the validity of extrapolations.

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

Safety Basis for Hanford Tank Farms. The Board identified that the revised Technical Safety Requirements for flammable gas and waste transfers had eliminated key safety controls and that the site's independent validation of the implementation of the Documented Safety Analysis was inadequate. Continued questions by the Board led to the further discovery that the contractor had inadvertently put a tank at risk of retaining and releasing significant quantities of flammable gas. As a result, DOE rewrote the Technical Safety Requirements to reinstate 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 Board evaluated the safety risks associated with delays in the design and construction of the Salt Waste Processing Facility and urged DOE not to eliminate funding for this important work. DOE has since restored funding for this project and is currently pursuing a program plan that will accelerate waste stabilization and risk reduction. The Board reviewed the Critical Decision (CD)-1 facility design documentation and identified weaknesses in the performance categorization and potential seismic interactions of various portions of the facility. DOE plans to perform further analysis and upgrades to the facility's structural components to address the Board's concerns.

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

Hanford High-Level Waste Tank Integrity. The Board reviewed the tank inspection program at Hanford and proposals to relax requirements for corrosion inhibitors in the tank waste. The Board provided input during meetings of a Corrosion

Examples of FY 2004 Accomplishments

Expert Panel held at Hanford to evaluate the proposed changes. The panel recommended maintaining the existing corrosion inhibitor controls until a solid technical basis can be developed.

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

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

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

Safety Basis for Mobile Transuranic Waste Characterization Units. The Board reviewed the DOE-authored Basis for Interim Operation for the operation of mobile transuranic waste characterization units. The Board discovered inadequacies concerning quantities of material at risk, analysis of deflagrations, and in the controls specified in the Technical Safety Requirements. Following several discussions and a Board letter, DOE agreed to add several new controls including a formal container inspection program and lid restraints for unvented drums, and will require an Operational Readiness Review for new deployments to ensure sites receiving the units are ready to operate them safely.

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

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

Fernald Silo 3 Waste Disposition Project. The Board reviewed the safety analysis for the Silo 3 waste disposition project and raised questions 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 Board also provided comments on ways to improve the readiness review plans for the startup of the Silo 3 project that were accepted by the contractor and DOE.

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

Examples of FY 2004 Accomplishments

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

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 Board 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 Board 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 Board 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 Board 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 Board's Recommendation 2001-1 in 2001, the Board 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 Board'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 Board 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 Board 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 Board 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 Board is continuing to provide input and oversight as DOE works to solve this problem.

Laboratory Support for Long-Term Plutonium Storage. The Board 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 Board 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.

Examples of FY 2003 Accomplishments

Fernald Closure Project. A review by the Board 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 Board 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 Board 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 Board'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 Board 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 Board notified DOE Headquarters of the situation. The Board 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 Board evaluated a significant fire that occurred on May 6, 2003, during glovebox removal activities in Building 371 at RFETS. The Board'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 Board 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 Board 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 Board continued to review planning and implementation of work being done at Hanford. The Board 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 Board 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 Board 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 Board 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.

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 2002 Accomplishments

Stabilization and Storage of Legacy Materials. In Recommendations 94-1 and 2000-1, the Board urged DOE to address legacy nuclear materials remaining following the shutdown of many defense nuclear facilities, recognizing that unstable materials and undesirable storage conditions would worsen with age. In November 2001, the Board provided further suggestions regarding the strategy and schedule for stabilization activities at SRS and LANL. In July 2002, DOE provided an acceptable plan for SRS. However, DOE still has not developed an adequate plan for the materials at LANL, and in August 2002, the Board reiterated the need to expedite stabilization activities there and suggested means by which this could be achieved.

Plutonium Stabilization. DOE completed several significant milestones in implementation of Board Recommendation 94-1. Rocky Flats Environmental Technology Site completed repackaging more than 100 tons of plutonium-bearing residues and about one half of its plutonium metal and oxide. Hanford completed packaging its plutonium metal and stabilized all of its plutonium solutions.

Uranium-233 Stabilization. In response to Board Recommendation 97-1, DOE commenced its ^{233}U inspection program at Oak Ridge National Laboratory. This program will characterize the hazards of materials stored for more than 20 years with little surveillance. So far, most packages inspected have been found to be in good condition, except for a package containing an uncommon form of ^{233}U. The inner can of this package was severely corroded.

Hanford Spent Nuclear Fuel Project. During FY 2002, substantial progress was made in implementation of Recommendation 94-1 to stabilize spent nuclear fuel from the Hanford K-Basins. Removal, treatment, and packaging of fuel from K-West Basin continued throughout the year, although recurring equipment problems hampered initial progress. The Board's review of DOE's maintenance management program led to improved equipment availability and an increase in the fuel removal rate. The risk from continued storage of the degrading fuel and sludge in the K-East Basin will be mitigated when this system becomes operational in early FY 2003.

Hanford High-Level Waste System. Following a leak from the primary to secondary hose in a high-level waste transfer line, the Board discussed with Hanford personnel the need to revise qualification tests for transfer lines, inspect the hose assembly to identify the failure mechanism, and address component aging issues. The Board again met with Hanford senior managers after it became apparent that similar waste transfers were being planned and that needed inspections had not been performed. Subsequently, DOE directed the contractor to perform the necessary evaluations and provide written justification prior to conducting waste transfers through such transfer lines.

Savannah River Confinement System Integrity: In June 2002, the Board determined that DOE was not taking appropriate actions to correct a known deficiency with the H-Canyon confinement ventilation system. An interface with a non-seismically sound system renders the facility vulnerable to an unfiltered ground-level release of contamination during canyon accidents, especially a seismic event. The Board notified DOE of this vulnerability and requested timely corrective actions.

Savannah River Depleted Uranium Storage. In March 2002, the Board identified the need for DOE to address large quantities of depleted uranium materials stored in deteriorating containers and facilities at Savannah River. As a result, senior DOE management has initiated actions to disposition the material.

Y-12 National Security Complex. As a result of continuing efforts by the Board, the safety posture of Building 9206 has been improved. Stabilization of pyrophoric materials in Building 9206 was completed during FY 2002. Other highly reactive material has been processed and shipped out of the facility. Progress was also made in reducing the building's inventory of containerized highly-enriched uranium solids.

Examples of FY 2002 Accomplishments

Lawrence Livermore National Laboratory. In March 2002, the Board issued a letter to DOE highlighting the need to strengthen program planning and work integration for the deactivation of the LLNL Heavy Element Facility, Building

251. Subsequently, the laboratory began to implement the applicable DOE requirements. A project management plan that is now being developed has resulted in a better understanding of the complexity of the proposed work.

Rocky Flats Deactivation and Decommissioning (D&D) Activities. In a March 2002 letter to DOE, the Board identified that improvements in activity-level work planning were needed to ensure that the often unique tasks associated with D&D work at Rocky Flats could be conducted safely. The Board also highlighted the need for improved DOE oversight of the contractor's work planning, and for improved feedback and improvement processes to ensure that the underlying causes of problems in the planning and execution of D&D work are identified and corrected. DOE is taking comprehensive actions to address these issues.

An increasing amount of decommissioning work at Rocky Flats is planned to be performed by subcontractors and other personnel not directly assigned to the major D&D projects. The Board observed that actions planned by DOE and its contractor to address past problems with this approach did not clearly address the flow-down of safety requirements and processes for work planning and work control, or the need for stronger on-the-floor oversight. In response, DOE has identified actions to address these weaknesses and ensure that D&D work performed by subcontractors and other outside organizations is planned adequately, controlled properly, and conducted safely.

The Board observed that the D&D projects in Rocky Flats Building 707 and Building 776/777 had experienced many punctures of glovebox gloves. Onsite evaluations by the Board also noted that D&D personnel were not consistently using cut-resistant gloves while handling sharp objects during D&D activities. Board discussions with Rocky Flats management personnel led to an increased emphasis on the use of cut-resistant gloves for D&D work, which is expected to help reduce worker injuries and contamination.

Hanford D&D Activities. The Board identified a concern regarding the potential for worker injuries due to the use of canvas gloves to remove stuck and damaged blades from a large portable band saw used in D&D work in a nuclear facility at Hanford. Hanford management agreed with the concern, and has directed workers perform such activities using tools rather than their hands.

Miamisburg Environmental Management Project (MEMP). During a review of the MEMP work control program, the Board identified discrepancies between the integrated work control and maintenance control procedures, and a need for improved linkage between the two documents. The contractor took corrective actions to improve the work flow and the safety of maintenance activities.

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 2001 Accomplishments

High-Level Waste Management at the Savannah River Site. In response to the leakage of high-level waste (HLW) from a storage tank at the Savannah River Site (SRS), combined with inadequate corrective action from DOE and its contractor, the Board issued Recommendation 2001-1, *High-Level Waste Management at the Savannah River Site.* This recommendation, issued March 23, 2001, urged DOE to remove waste from the leaking tank and to undertake several initiatives to improve the overall safety and operability of the HLW system at SRS.

High-Level Waste Tank Integrity. The Board has continued to press DOE to improve programs that protect and verify the integrity of the high-level waste storage tanks at Hanford and Savannah River. As a result, during FY 2001, DOE made several improvements to its tank integrity program at Hanford, including adding corrosion inhibitors to tanks with off-specification chemistry and implementing improved requirements for monitoring tank chemistry and operating the annulus ventilation systems which help prevent corrosion of the primary tank wall.

Stabilization and Storage of Legacy Materials. In Recommendations 94-1 and 2000-1, the Board urged DOE to address legacy nuclear materials remaining following the shutdown of many defense nuclear facilities, recognizing that unstable materials and undesirable storage conditions would deteriorate with age. DOE has since taken action to mitigate some of the most immediate concerns, but much of the material has yet to be addressed. In January 2001, in response to issues raised by the Board, DOE provided an updated implementation plan for completing stabilization of the remaining materials. The Board did not fully accept this plan, and, in a letter to DOE dated March 23, 2001, identified the need to further expedite stabilization activities at the Savannah River Site and Los Alamos National Laboratory. DOE is now making progress toward successful resolution of the Board's remaining issues.

Plutonium Stabilization and Packaging. During FY 2001, Rocky Flats, Hanford, and Lawrence Livermore National Laboratory each began packaging plutonium into high-integrity long-term storage containers. This represented the culmination of several years of preparations, and fulfills a commitment made by DOE in response to the Board's Recommendations 94-1 and 2000-1 regarding the stabilization of legacy nuclear materials. Also during FY 2001, Hanford began stabilization of the plutonium solutions stored at the Plutonium Finishing Plant, in response to Recommendations 94-1 and 2000-1.

Uranium-233 Stabilization. In response to Board Recommendation 97-1, *Uranium-233 Safe Storage,* DOE successfully completed readiness preparations for the uranium-233 inspection program at Oak Ridge National Laboratory. This program is needed to characterize materials that have been stored for more than 20 years with little surveillance. Safety issues identified by the Board during the preparations for the inspections have been resolved by DOE, and the Board expects that DOE will perform the first canister inspections in September 2001.

Hanford Spent Nuclear Fuel Project. During FY 2001, a major milestone in the implementation of Recommendation 94-1 was reached with the start-up of stabilization of spent fuel from the Hanford K-West Basin. The safe start-up of this activity followed several years of intensive preparations by DOE, and extensive oversight by the Board which led to the identification and correction of numerous safety issues before operations commenced.

Decommissioning Activity at Miamisburg Environmental Management Project. During FY 2001, the Board's staff reviewed worker training and the implementation of the occurrence reporting and Unreviewed Safety Question processes used during decommissioning work at MEMP. The staff found deficiencies in training and weaknesses in the implementation of these processes. Subsequently, the contractor made revisions to its programs and implemented a computer-based training records system.

Building 9206 at Oak Ridge. For several years, the Board has pressed DOE to pursue risk reduction and deactivation activities at the Y-12 National Security Complex Building 9206. In early FY 2001, shortly after an onsite review, the Board sent a letter to DOE noting that three accomplishments in support of deactivation and risk reduction had been achieved, but that the hazards of most concern to the Board had not been markedly alleviated. During a follow-up review

in May 2001, the Board's staff noted that significant steps had been taken to raise the priority of hazard reduction and that more aggressive efforts were being considered, including reclassifying some materials as waste for direct disposal. The Board found it encouraging that a recently issued revision to the baseline plan for the facility presents an accelerated option that completes deactivation in six years, and that efforts to stabilize pyrophoric material were proceeding toward an Operational Readiness Review before the end of FY 2001.

Hanford Site Deactivation Activities. During FY 2001, the Board's staff continued to review deactivation and decommissioning efforts at Hanford. Comments regarding safety were given to the contractor; subsequently, changes were made and improvements were evident. The Board also evaluated the site-wide approach to excess facility disposition at Hanford, and provided suggestions to improve the processes used to manage such work in a letter to DOE in August 2001. A significant event that occurred in FY 2001 as a result of Board effort was the start-up of facility characterization activities at the defunct Bulk Reduction Building (224-T).

Rocky Flats Environmental Technology Site. The Board's staff observed deactivation and decommissioning work activities in the field, reviewed various planning and authorization basis documents, and engaged RFETS management personnel on various technical issues. The Board's staff evaluated actions taken by RFETS following bioassay results that indicated the intake of radioactive material by ten individuals who were involved with work in Building 771. In addition, the staff evaluated the contractor's Price Anderson "root cause analysis" report and identified that this report did not clearly address deficiencies associated with the basic functions and principles of Integrated Safety Management. Contractor management indicated that they would review the report and corrective actions in light of the staff's observations. Furthermore, subsequent to this occurrence, the Board's staff began a review of the sensitivity of bioassay analysis, sample frequency, and work place indicators.

The Board's staff also provided comments to RFETS regarding work planning and control problems. Subsequent to these interactions, the Board has noted improvements as a result of the promulgation of guidance, revised documents, and increased management attention.

5. 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 Board. Follow-up technical evaluation will verify necessary improvements in the design and construction of DOE's new nuclear facilities and major modifications to existing facilities. New nuclear facility designs will meet acceptable safety standards.

SUMMARY: Increased DOE design and construction activity in FY 2006 will require the Board to significantly increase its oversight in this area to ensure that new facilities will be adequate to perform their intended functions safely. The key performance objectives for FY 2006 in this strategic area of concentration are:

- Ensure adequate design and construction 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 the construction of a treatment facility for high-level waste liquids and salts at the Savannah River Site (SRS), and system improvements to ensure safe management of SRS high-level waste
- Review modifications to existing SRS facilities to increase long-term plutonium storage capacity and provide long-term stabilization/packaging capability.
- Review the design of the Chemistry and Metallurgical Research Facility replacement at the Los Alamos National Laboratory.

Future Challenges for the Board's Safety Oversight:

Design and Construction of Nuclear Facilities. One of the Board's statutory responsibilities is the review of design and construction projects for DOE's defense nuclear facilities to ensure that adequate health and safety requirements are identified and implemented. These facilities must be designed and constructed in a way 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. Integrated Safety Management (ISM) provides the framework for this process. The Board's expectation is that the design and construction phases will identify the unique set of risks for each project and demonstrate clear and deliberate implementation of ISM principles and core functions.

Board reviews of the design and construction of major facilities and projects are resource intensive and time consuming, but they result in significant safety improvements. The Board has demonstrated the value of rigorous technical oversight to ensure that safety is addressed early in the design process. The following list provides a brief description of major DOE projects currently underway, or planned for the near future, which will require significant Board resources to review. The list describes each project and provides an informal rating of three characteristics: Significance (overall importance of the facility to the mission of the complex); Complexity (relative assessment of the difficulty in successfully implementing the design); and Risk (assessment of programmatic risk and safety risk for the facility).

- **Fernald** - Silo Project - to retrieve and dispose of, or store low-level waste from the Fernald Silos. HIGH SIGNIFICANCE, MODERATE COMPLEXITY, LOW RISK.

- **Hanford Site (Office of River Protection)** - Initial Tank Retrieval Systems and Waste Feed Delivery System - long-term project to provide feed to the proposed Hanford Waste Treatment Plant. This project combines the Tank Farm Restoration and Safe Operation Project and Waste Feed Delivery System Project. HIGH SIGNIFICANCE, HIGH COMPLEXITY, HIGH RISK.

- **Hanford Site (Office of River Protection)** - Waste Treatment Plant - A project consisting of three major nuclear facilities to pretreat and vitrify some of the waste from the Hanford high-level waste tank farms. HIGH SIGNIFICANCE, HIGH COMPLEXITY, HIGH RISK.

- **Hanford Site (Office of River Protection)** - Immobilized High-Level Waste Interim Storage Facility - to provide storage for glass waste canisters produced at the Waste Treatment Facility. HIGH SIGNIFICANCE, LOW COMPLEXITY, LOW RISK.

- **Hanford Site (Richland Operations Office)** - Spent Nuclear Fuel Dry Storage Project - to provide safe storage for spent nuclear fuel stored in modern, robust containers. HIGH SIGNIFICANCE, MODERATE COMPLEXITY, HIGH RISK.

- **Hanford Site (Richland Operations Office)** - Cesium/Strontium Dry Storage Project - to provide a new facility to store approximately 2000 capsules of cesium and strontium salts containing more than 100 megacuries of radionuclides. The capsules are presently stored in a water-filled basin at Hanford. HIGH SIGNIFICANCE, MODERATE COMPLEXITY, HIGH RISK

- **Idaho National Engineering and Environmental Laboratory -** (Advanced Mixed Waste Treatment Project) - to retrieve, treat, and dispose of waste drums from INEEL. MODERATE SIGNIFICANCE, MODERATE COMPLEXITY, MODERATE RISK.

- **Lawrence Livermore National Laboratory** - Tritium Facility Modernization Project - Modify the existing Tritium Facility to expand tritium research and development capability. MODERATE SIGNIFICANCE, MODERATE COMPLEXITY, MODERATE RISK.

- **Los Alamos National Laboratory** - TA-18 Mission Relocation - to relocate and/or upgrade the criticality facility to replace the current facility. HIGH SIGNIFICANCE, HIGH COMPLEXITY, HIGH RISK.

- **Los Alamos National Laboratory** - Site-Wide Fire Alarm - to replace the current outmoded and unreliable fire alarm system with a modern system tied into the new Emergency Operations Center. MODERATE SIGNIFICANCE, LOW COMPLEXITY, MODERATE RISK.

- **Los Alamos National Laboratory** - TA-54 Waste Management Mitigation - to mitigate fire-related vulnerabilities in TA-50 (radioactive liquid waste operations) and TA-54 (solid waste) operations. MODERATE SIGNIFICANCE, LOW COMPLEXITY, LOW RISK.

- **Los Alamos National Laboratory** - Chemistry, Metallurgical Research Facility Replacement - to replace the current aging and deteriorating facility with a modern facility. HIGH SIGNIFICANCE, HIGH COMPLEXITY, HIGH RISK.

- **New Pit Production Facility (final location to be determined)** - new facility for production of pits for the nuclear stockpile. HIGH SIGNIFICANCE, HIGH COMPLEXITY, HIGH RISK.

- **Pantex Plant** - Building 12-64 Upgrade - to upgrade the existing facility to current standards for nuclear explosive operations to provide for future and near-term, weapons systems refurbishment capacity. HIGH SIGNIFICANCE, MODERATE COMPLEXITY, HIGH RISK.

- **Pantex Plant** - Special Nuclear Material Component Requalification Facility - to convert an area in 12-86 (currently used for joint test assembly (JTA) operations) for use with various operations necessary to requalify certain special nuclear material for reuse. The most hazardous of the proposed operations will be pit tube replacement. MODERATE SIGNIFICANCE, LOW COMPLEXITY, MODERATE RISK.

- **Savannah River Site** - Tritium Extraction Facility - to provide a new facility to extract tritium from tritium producing burnable absorber rods (TPBAR) that will be irradiated in commercial power reactors. HIGH SIGNIFICANCE, HIGH COMPLEXITY, HIGH RISK.

- **Savannah River Site** - Extended Plutonium Storage - to provide a capability to store, stabilize and package plutonium consolidated at the Site from the DOE complex. HIGH SIGNIFICANCE, HIGH COMPLEXITY, HIGH RISK.

- **Savannah River Site** - HLW Salt Processing Facility - to be used to remove cesium, strontium, and actinides from high-level waste. The high-activity stream would go to the Defense Waste Processing Facility for vitrification in glass logs. The low-activity stream would go to the Saltstone Production Facility for disposal in grout. HIGH SIGNIFICANCE, HIGH COMPLEXITY, MODERATE RISK.

- **Savannah River Site** - Pit Disassembly and Conversion Facility - to convert surplus weapons-grade plutonium metal into oxide for subsequent feed to the Mixed Oxide (MOX) Fuel Fabrication Facility. HIGH SIGNIFICANCE, HIGH COMPLEXITY, HIGH RISK.

- **Savannah River Site** - Waste Solidification Building - to process waste streams generated in the Pit Disassembly and Conversion Facility and MOX Plant. MODERATE SIGNIFICANCE, LOW COMPLEXITY, LOW RISK.

- **Savannah River Site** - Glass Waste Storage Building #2 - to provide a second storage building for glass waste canisters produced at the Defense Waste Processing Facility. HIGH SIGNIFICANCE, LOW COMPLEXITY, LOW RISK.

- **Savannah River Site** - High Activity Treatment Facility - Transuranic (TRU) Waste - to provide capability to size reduce and re-package high activity transuranic waste in large containers that are incompatible with shipping in TRUPACTs to WIPP. HIGH SIGNIFICANCE, MODERATE COMPLEXITY, MODERATE RISK.

- **Savannah River Site** - Intermediate Level Tritiated Vault - to receive tritium contaminated waste to support an expected increase in tritium contaminated waste material from the Tritium Extraction Facility. HIGH SIGNIFICANCE, LOW COMPLEXITY, MODERATE RISK.

- **Savannah River Site** - Actinide Removal Process - to modify an existing facility (Late Wash Facility) in order to install equipment to remove actinides from high-level waste prior to treatment or disposal. HIGH SIGNIFICANCE, MODERATE COMPLEXITY, MODERATE RISK.

- **Y-12 National Security Complex** - Highly Enriched Uranium Materials Facility - to provide long term consolidated storage for all highly enriched uranium material forms at the Y-12 Site. HIGH SIGNIFICANCE, MODERATE COMPLEXITY, MODERATE RISK.

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.

FY 2006 Performance Objectives

The Board 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 hazards analyses; the design of safety-related structures, systems and components (SSC); and the adequacy of SSC installation, startup and operational readiness. Candidates for review include:

Continue design and construction reviews of the Waste Treatment Plant at the Hanford Site. 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 stabilization/packaging capability. (Public Law 107-314, Section 3183)
- Evaluate the construction of the Pit Disassembly and Conversion Facility at SRS.
- Review the design of the Chemistry 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 system 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 Board. Follow-up technical evaluation will verify necessary safety improvement in the design and construction of DOE's new nuclear facilities and major modification to existing facilities. New nuclear facility designs will meet acceptable safety standards.

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

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

- The contractor had planned to eliminate much of the fire-resistive coatings on the structural steel used in the facilities. Eliminating the coatings is inconsistent with DOE's own requirements as well as industry standards. This decision is now being reversed.
- The cesium ion exchange system could accumulate explosive concentrations of hydrogen gas. Furthermore, the hydrogen generation rates, hydrogen gas retention and release in waste tanks, and the ability of the mixing systems to prevent gas accumulation in the stored high-level waste tanks was not understood. DOE has now added an inerting system to the cesium ion exchange system to manage hydrogen flammability.
- One of the facilities in the WTP contains areas that by design will not be accessible after construction. The Board was concerned that the design of equipment in these areas were not sufficiently robust to operate normally for 40 years without maintenance. The Board encouraged DOE to further evaluate the performance criteria and validate that this equipment could in fact be expected to perform for this extended period of time. DOE conducted the study and is now correcting noted deficiencies and is also considering providing limit access to the areas for maintenance.
- In response to Board concerns with the large number of weld defects and missing leak tests for a high-level waste vessel, DOE performed root cause analyses which identified significant weaknesses in vessel technical specifications, fabrication oversight, and engineers' understanding of safety requirements. DOE is now implementing corrective actions for these weaknesses.
- DOE proposed delegating their approval of safety-related expectations (codes, major design changes, and safety control modifications) to the contractor. As a result of the Board's objections, DOE significantly modified their process and maintained their control of the standards and design of the Waste Treatment Plant.
- The criteria proposed by the contractor to be used to accept a new, experimental concrete mixture was inadequate. As a result, additional acceptance criteria were developed to ensure the concrete's quality would be suitable.

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

Pit Disassembly and Conversion Facility. The Board has been reviewing the structural design for the Pit Disassembly and Conversion Facility (PDCF) to be located at the Savannah River Site. The Board has ensured the structural design criteria were adequate, the geotechnical evaluations were appropriate, and the soil-structure interaction (SSI) analysis was adequate for the PDCF structures. In response to a Board letter dated May 13, 2003, the contractor conducted a fire risk analysis to assess a seismically induced full-facility fire. The Board is reviewing the final design to ensure that it is adequate and incorporates appropriate defense-in-depth.

Examples of FY 2004 Accomplishments

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

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

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

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

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

Electrical Safety Handbook. In a letter to DOE dated August 7, 2003, the Board identified weaknesses with the proposed revision to the Electrical Safety Handbook, DOE-HDBK-1092-98. The Board requested that DOE provide effective, detailed guidance to contractors on electrical safety programs. In July 2004, DOE revised the handbook to include the details of electrical safety and 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 Board 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 Board 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 Board is taking place as the design progresses.

High Enriched Uranium Materials Facility (HEUMF). In a Board 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 Board 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 Board 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 Board'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 Board 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 Board 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 Board has conducted extensive design reviews of the Tritium Extraction Facility (TEF) at the Savannah River Site. The Board 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 Board and on December 19, 2002, the Board 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 Board 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 Board 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 Board 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 Board 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.

Examples of FY 2003 Accomplishments

The Board 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 Board 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 Board 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 Board 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 Board in FY 2002. DOE and LANL have taken some actions to improve safety, including revising the process hazard analysis. The Board 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 Board has pushed for resolution of longstanding concerns regarding the hazards of certain portions of the operations associated with the LANL dynamic experiments. The Board 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 Board also successfully enforced agreement on a project standard on vessel construction.

Plutonium Storage at SRS. In response to a Congressional reporting requirement, the Board 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 Board 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.

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 2002 Accomplishments

Fire Protection in B-1 Wing at Y-12. Proposed upgrades to the fire protection program supporting the wet chemistry area consisted of minor plant improvements and nearly 35 administrative controls. The Board noted significant problems with maintaining administrative controls at Y-12, and identified inconsistencies in the safety basis supporting this operation. Based on interactions with the Board, NNSA acknowledged the safety issue, re-evaluated the safety basis, and is considering fixed fire suppression to protect the structure and its workers.

Building 12-64 Seismic Analysis at Pantex. In 1998, the Board wrote DOE, expressing concern with the seismic response of Building 12-64. In 2002, NNSA informed the Board of its intention to upgrade Building 12-64 in preparation for resuming nuclear explosive operations there. A subsequent meeting between NNSA personnel and the Board's staff identified concerns with analyses that had been completed to address the Board's original concerns. Efforts to improve the analyses and identify potential engineering solutions have begun.

Plutonium-238 Scrap Recovery Line at LANL. LANL was proceeding toward initial operation of the plutonium-238 scrap recovery line by the end of FY 2002. The Board noted that the project had not fully characterized and developed controls to address the hazards associated with this operation. DOE and LANL actions to respond to these issues and safely start up the scrap recovery line have just begun.

LANL Classified Experiment. The Board noted that for key aspects of this experiment, engineering approaches developed to control hazards have been insufficient, particularly given the stated schedule and intent to complete a documented safety analysis consistent with that schedule. DOE is reviewing potential actions.

Emergency Power System at the LLNL Plutonium Facility. In April, 2002, the Board identified deficiencies in LLNL's emergency electrical power system, which did not meet safety-class standards and IEEE codes. As a result of the Board's efforts, LLNL developed an action plan to correct the deficiencies.

Lightning Protection at LANL. In a letter dated August 6, 2002, the Board noted that the safety-class lightning protection system at the LANL's Weapons Engineering and Tritium Facility does not appear to provide adequate lightning protection for the facility. In addition, the Board attached a report presenting additional deficiencies with the lightning protection systems at various facilities at LANL. LANL personnel are working to address these issues.

Emergency Operations Center at LANL. The new Emergency Operations Center (EOC) was tentatively sited in the deformation zone associated with the seismically active Pajarito fault. The Board noted that basic emergency operations could be impacted in the event of an earthquake, and that it would be better to consider the new EOC as one element in an emergency system which included an older EOC and a mobile command center. LANL agreed that this concept provided a more robust capability, and it is being implemented.

Hanford Spent Nuclear Fuel Project. During FY 2002, substantial progress was made in implementation of Recommendation 94-1 to stabilize spent nuclear fuel from the Hanford K-Basins. DOE completed construction of a system to remove fuel from the K-East Basin for stabilization. The risk from continued storage of the degrading fuel and sludge in the K-East Basin will be mitigated when this system becomes operational in early FY 2003.

Site-Specific Safety Issue Reviews. At LLNL, a review of the emergency power system in Building 332 disclosed a lack of understanding of system vulnerabilities. As a result of this review, the contractor has committed to perform a comprehensive reliability study of the system.

Examples of FY 2002 Accomplishments

Highly Enriched Uranium Materials Facility at Y-12. The Board's staff conducted in-depth reviews of the design of the Highly Enriched Uranium Materials Facility at Y-12. The Board concluded that additional design work was needed in order to more accurately document the design bases and to specify the general design criteria and specific requirements for safety class systems, structures, and components at the facility. As a result of the Board's efforts, a number of immediate safety improvements were implemented. DOE agreed to address the Board's concerns regarding building foundation alternatives and the need to obtain higher-quality data on soil and rock material properties of the site.

In addition, the general design criteria have been changed to more adequately capture the appropriate codes and standards.

Hanford Waste Treatment Plant. The Board's staff continued the review of the design and construction activities related to the Hanford Site's Waste Treatment Plant. Specific structural reviews focused on the facility site geotechnical issues, site seismicity, and the structural adequacy of the facility basemat design. The Board issued a letter to DOE on August 8, 2002, describing concerns regarding the structural design margins being used in view of the aggressive design and construction schedule for this project.

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 2001 Accomplishments

LANL Classified Experiment. As a result of the Board efforts, DOE and LANL have reached an agreement on a defensible design basis for the confinement vessels to be used for these experiments. The Board has also worked to ensure that an acceptable approach for developing the overall authorization basis for these experiments is institutionalized in the directive system for application to future experiments at LANL.

Design and Construction at LANL. The Board had previously emphasized the need to identify and analyze hazards and develop controls to protect the public, workers, and the environment early in the design process for hazardous projects. Delays had been encountered in an important project because design criteria were not developed early in design. As a result of the Board's efforts, these issues have now been resolved and LANL is making progress to replace this important safety system.

Project Management/Engineering. During reviews at Los Alamos National Laboratory and Y-12, the Board and its staff identified a lack of qualified, highly experienced federal project managers capable of managing design and construction of major nuclear projects. The staff also found that DOE's local project engineering review process was inadequate to identify issues concerning quality assurance and potential safety implications. The Board asked NNSA to evaluate these concerns and develop a corrective plan to address this important human resource need to ensure that safety is integrated in the design and construction of DOE nuclear projects.

Design of Tritium Extraction Facility. The Tritium Extraction Facility, currently under construction at SRS, will replenish the tritium reserves for the Nation's nuclear weapon stockpile. The Board identified needed improvements in design, including the potential impact of water on electrical/electronic components, the need for additional high range gamma monitors, and the need to improve structural response to potential earthquakes. In response, DOE modified the design criteria, completed enhanced seismic response calculations, and provided improvements in its program for ensuring quality construction.

Hanford Spent Nuclear Fuel Project. Results of the ongoing review of the Hanford Spent Nuclear Fuel Project (SNFP) by the Board's staff were documented in DNFSB/TECH-30, *Safety Review of the Hanford Spent Nuclear Fuel Project During the Design and Construction Phase*, issued in February 2001. This report described safety issues identified by the Board's staff and their resolution. Lessons learned were identified for application to future activities in the K-East Basin.

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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.

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

SUMMARY: For FY 2006, the key performance goals and initiatives of the Board in this area are intended to resolve continuing problems and ensure safety is improved at the level of the workers. If safety of the workers at DOE defense nuclear facilities can be improved, then the safety of the public more distant from the hazards will be substantially improved. Major efforts to achieve this goal in FY 2006 include:

- Ensure that DOE and its contractors apply the principles of integrated safety management at the activity level, i.e., that work scope is properly identified, that workers know the hazards and controls for their work, that work is performed in accordance with those controls, and that feedback and improvement is used to reduce further the risks of future work.

- Ensure that directives that inform DOE personnel and contractors how to fulfill their responsibilities safely are evaluated and strengthened where necessary, including the development of new safety directives to provide guidance in areas for which none is currently available.

- Strengthen the application of quality assurance principles at defense nuclear facilities to improve the reliability and effectiveness of controls used to prevent or mitigate potential radiological accidents.

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.

FY 2006 Performance Objectives

The Board will continue to assess the adequacy of proposed changes to DOE directives to ensure that any revisions are appropriate and adequate. The results of reviews completed by the Board will be provided to DOE for action. The Board anticipates that approximately 20 DOE directives that may impact public and worker health and safety require review, of which two or three are likely to require significant Board and staff interaction to ensure satisfactory resolution of potential issues. In those rare cases in which new directives are determined to be required, the Board will work with DOE to ensure that the applicable documents are developed adequately. The Board also expects to continue its involvement in the efforts of the National Nuclear Security Administration (NNSA) to establish its own directive system. It is estimated that 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 Board will continue its reviews of DOE's implementation of Integrated Safety Management (ISM), as well as ongoing efforts to make ISM more effective. At least five reviews will be completed. Candidates for review include:

- Activity-level ISM implementation at sites with performance indicators judged to have higher than expected rates of abnormal occurrences related to worker protection.
- 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 Board has noted that considerable progress has been made in the implementation of ISM, but that continued DOE efforts are necessary to maintain ISM systems and ensure continuous improvement across the complex. Specific functional areas will be sampled to a greater depth, such as training and qualification, quality assurance, nuclear criticality safety, software quality assurance, conduct of operations, 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 Board 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 Board anticipates that the effort to complete the implementation plan associated with Recommendation 2004-1, *Oversight of Complex, High Hazard Nuclear Operations*, will have required significant Board and staff interaction with multiple federal and contractor agencies.

The Board 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.

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.

FY 2005 Performance Objectives

The Board will continue to assess the adequacy of proposed changes to DOE directives to ensure that any revisions are appropriate and adequate. The results of reviews completed by the Board will be provided to DOE for action. The Board anticipates that approximately 20 DOE directives that may impact public and worker health and safety require review, of which two or three are likely to require significant Board and staff interaction to ensure satisfactory resolution of potential issues. The Board also expects to continue its involvement in the efforts of the National Nuclear Security Administration (NNSA) to establish its own directive system. It is estimated that 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 Board will continue its reviews of DOE's implementation of Integrated Safety Management (ISM), as well as ongoing efforts to make ISM more effective. At least five reviews will be completed. Candidates for review include:

- Activity-level ISM implementation at sites with performance indicators judged to have higher than expected rates of abnormal occurrences related to worker protection.
- Activity-level ISM at several NNSA sites.
- Activity-level ISM for non-10 CFR 830 activities.
- 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 Board has noted that considerable progress has been made in the implementation of ISM, but that continued DOE efforts are necessary to maintain ISM systems and ensure continuous improvement across the complex. Specific functional areas will be sampled to a greater depth, such as training and qualification, quality assurance, nuclear criticality safety, software quality assurance, conduct of operations, 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 Board 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 Board anticipates that this effort will have required a series of public meetings and significant Board and staff interaction with multiple federal and contractor agencies.

The Board 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.

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

DOE Directives. As part of its ongoing review of new and revised DOE directives, the Board and its staff evaluated and provided constructive critiques of 37 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 19 pending directives to improve the content, clarity, and consistency in safety requirements and guidance. Examples include:

- **Applicability of DOE Order Requirements.** The Board has been instrumental in preventing enactment of a DOE proposal to restrict "the applicability of DOE Orders to only major facility management contractors." This proposal would have the detrimental effect of undermining the application of specific safety-related requirements to a wide range of DOE contractors and sub-contractors, including contractors whose personnel are conducting hands-on work on nuclear materials.
- **Electrical Safety.** In June 2001, the Board 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 Board learned that DOE had deleted much of the technical content in the proposed revision. The Board informed DOE that this was unacceptable, especially in light of the high rate of electrical safety incidents observed across the defense nuclear complex. DOE agreed to revise the handbook to include the details of electrical safety and a guidance for effective electrical safety program . The Board worked closely with DOE to ensure appropriate technical safety content was included. In July 2004, DOE submitted a revised handbook to the Board and to the field for comment. DOE plans to issue the handbook by October 2004.
- **DOE Functional Area Qualification Standards.** During the past three years, the Board has driven DOE to upgrade and incorporate 30 functional area qualification standards for federal employees into the DOE Directives System. During the past year, the Board's staff reviewed and evaluated the final 14 DOE functional area qualification standards in such areas as nuclear safety, construction management, facility maintenance, technical training, and civil engineering. This effort significantly improved the technical content and rigor of these DOE qualification standards, and will help to raise the technical competence of DOE personnel.
- **Hoisting and Rigging Safety.** The Board continued to follow closely DOE's programs, policies, and practices in activities related to hoisting and rigging at defense nuclear facilities. Insights from a number of field reviews were integrated to provide substantive input toward revising DOE-STD-1090-2001, *Hoisting and Rigging*. As a result of the Board's observations and input, significant revisions were made to this standard that will further enhance the safety of hoisting and rigging activities throughout the DOE complex.

Oversight of Complex, High-Hazard Nuclear Operations. During FY 2004, the Board conducted eight public hearings to examine DOE's methods of ensuring safety at defense nuclear facilities. The Board was concerned that changes in oversight contemplated by DOE and NNSA could unintentionally reduce nuclear safety. The Board also sought to benefit from the lessons learned as a result of investigations conducted by the Columbia Accident Investigation Board and the U.S. Nuclear Regulatory Commission following the discovery of the deep corrosion in the reactor vessel head at the Davis-Besse Nuclear Power Station. The Board concluded that there was cause for concern with regard to the potential increase in the possibility of nuclear accidents in the nuclear defense complex as evident in: (1) DOE's increased emphasis on productivity at the possible expense of safety, (2) the loss of technical competency and understanding at high levels of DOE's organizational structure, (3) the apparent absence of a strong safety research focus, and (4) the reductions in the central oversight of safety. On May 21, 2004, the Board issued Recommendation 2004-1, *Oversight of Complex, High-Hazard Nuclear Operations*, to ensure that the likelihood of a serious accident, facility failure, construction problem, or nuclear incident will not be increased as a result of DOE's well-intentioned changes. On July 21, 2004, the Secretary of Energy accepted the Board's Recommendation and tasked a team to begin developing an adequate implementation plan.

10 CFR 851, *Worker Safety and Health.* The Bob Stump National Defense Authorization Act, Public Law 107-314, directed DOE to promulgate regulations on worker safety and health, rather than rely exclusively on a contractual approach

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

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

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

Site Specific Safety Reviews. The development of a comprehensive safety basis and the identification and selection of an appropriate control set are essential cornerstones of safe operation at defense nuclear facilities. The Board conducted numerous reviews of the site-specific safety bases throughout the DOE complex. In particular, the Board reviewed the critical assumptions used in the development of the safety bases as well as the control strategies used to prevent and mitigate accident scenarios of concern for facilities and activities such as the Savannah River Site (SRS) and Hanford tank farms, the Waste Isolation Pilot Plant (WIPP) Mobile Waste Characterization and Loading Units, the Pantex Plant Onsite Transportation Program, Los Alamos National Laboratory's "Armando" subcritical experiment, Hanford Spent Nuclear Program's Sludge Removal Project, Sandia National Laboratories' Auxiliary Hot Cell Facility, and the Nevada Test Site (NTS) Device Assembly Facility, G-tunnel, and Onsite Transportation Programs. During the course of these reviews, the Board identified a number of specific instances where inappropriate assumptions and methodologies were used in the development of safety bases. These included analyses which did not always use bounding input assumptions and which implicitly credited non-qualified plant indications and equipment in the development of the safety analyses. These deficiencies resulted in situations where the safety analyses may not have appropriately bounded the actual hazard conditions for the facilities concerned. As a result of these concerns, DOE/NNSA and its contractors have implemented a number of corrective actions to address these issues. For example:

- At the Pantex Plant, multi-unit nuclear explosive operations remain suspended for the present until further testing and analysis can resolve the concerns or until adequate controls can be developed. Additional controls have also been imposed on some operations to assure safety given new information regarding electro-static discharge environments.
- At the Hanford Tank Farms, DOE rewrote the Technical Safety Requirements to reinstate key controls (such as Process Control Plans) that the Board had discovered were improperly eliminated. A second independent review was convened to ensure all safety controls had been implemented. The contractor has increased the frequency of taking key tank waste measurements so that current waste conditions were better understood, due to the Board's discovery that the contractor had inadvertently put a tank at risk of retaining and releasing significant quantities of flammable gas.

Examples of FY 2004 Accomplishments

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

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

NNSA Training and Qualification. The Board noted concerns with Federal oversight of training and qualification at the Pantex Plant. Most notably, required reviews of contractor training and qualification programs were not being performed. In July, the Board broadened 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 Board found that senior NNSA management had not taken prompt action to upgrade the programs at these three sites. A letter to NNSA identified this situation as unacceptable—NNSA was given 45 days to define the bounds of the problem, and 30 days to develop a corrective action plan.

Functions Responsibilities and Authorities (FRA) Documents. The Board continued to follow DOE activities in the closure process associated with Recommendation 98-1, *Resolution of Issues Identified by DOE Internal Oversight*. DOE is also obligated under DOE Manual 411.1, *Safety Management Functions Responsibilities and Authorities (FRA) Manual* to annually update the FRA Manual to reflect changes in organizational responsibilities and authorities. After significant effort on the part of the Board, DOE has developed a credible FRA Manual at the corporate level, and sub-tier FRAs in key DOE organizational elements (e.g., the Office of Environmental Management, and NNSA). The Board will continue to work with the DOE program offices throughout FY 2004 to refine their FRA documents to ensure safety roles and responsibilities are clearly defined.

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

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 Board 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 Board'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 Board 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 Board learned that DOE had deleted much of the technical content in the proposed revision. The Board informed DOE that this was unacceptable, especially in light of the high rate of electrical safety incidents observed across the defense nuclear complex. DOE is now revising the handbook.
- **Environment, Safety and Health Reporting.** During most of 2003, the Board worked closely with DOE to consolidate and revise the various DOE reporting orders into a single directive. The Board 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 Board 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 Board 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 Board 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 Board has reviewed 22 advance copies of proposed NNSA Policy Letters, in anticipation of their issue.

Software Quality Assurance: Considerable Board 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 Board's concerns with SQA, on September 23, 2002, the Board issued Recommendation 2002-1, *Quality Assurance for Safety-Related Software*. Development of the Implementation Plan (IP) for this recommendation required significant interaction between the Board and DOE—it was finally accepted by the Board on April 10, 2003. The Board will follow DOE's implementation efforts closely in FY 2004. In a related effort, members of the Board'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 Board 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 Board'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 Board'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 Board 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 Board 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 Board 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 Board noted concerns with Federal oversight of training and qualification at the Pantex Plant. Most notably, required reviews of contractor training and qualification programs were not being performed. In July, the Board broadened 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 Board continued to follow DOE activities in the closure process associated with Recommendation 98-1, *Resolution of Issues Identified by DOE Internal Oversight.* DOE is also obligated under DOE Manual 411.1, *Safety Management Functions Responsibilities and Authorities (FRA) Manual* to annually update the FRA Manual to reflect changes in organizational responsibilities and authorities. Despite significant effort on the part of the Board, DOE remains without a credible FRA Manual at the corporate level, and without sub-tier FRAs in a number of DOE organizational elements. The Board 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 Board worked with DOE to develop formal training and qualification requirements for contractor system engineers in response to Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems*. The Board 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 Board 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 Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems*, the Board 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 Board 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 Board conducted a number of site-specific safety reviews in the DOE complex. In particular, the Board 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 Board 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 Board 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 Board'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 Board 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 Board 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 Board 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 Board 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 Board has noted that reportable hoisting and rigging events continue to occur throughout the defense nuclear complex. As a result, the Board has developed a special initiative to review the adequacy of hoisting and rigging operations at selected DOE facilities. During this fiscal year, the Board 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 Board 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 Board 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.

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 2002 Accomplishments

As part of its ongoing review of new and revised DOE directives, the Board and its staff evaluated and provided constructive critiques of 19 directives associated with, but not limited to, hazards from natural phenomena, quality assurance, facility representative program, and DOE's emergency management program. At year's end, both staffs were in the process of resolving issues on 23 pending directives to improve the content, clarity, and consistency in safety requirements and guidance. Examples include:

- **Natural Phenomena Hazards.** Members of the Board's staff worked closely with DOE to revise criteria for design and evaluation of DOE facilities' ability to withstand hazards arising from natural phenomena such as earthquakes, severe storms, and floods (Revision of DOE-STD-1020-94). This effort was completed in January 2002, culminating in an updated standard meeting the requirements of current model building codes such as IBC 2000 and current industry standards. Three related standards (DOE-STD-1021-93, -1022-94 and -1023-95) were reviewed and reaffirmed, addressing performance categorization guidelines for systems, structures, and components; site characterization criteria; and criteria for assessment of natural phenomena hazards.
- **Software Quality Assurance.** Considerable staff resources were expended during FY 2002 in reviewing a new draft DOE Order, O-203.X, *Software Quality Assurance.* The Board's staff submitted formal comments to DOE in December 2001. The resolution of the staff's comments, as well as those from internal-DOE reviewers, is still pending.
- **Facility Representative Program.** The Board's staff reviewed the qualification standard for DOE Facility Representatives (TRNG-0019, *Facility Representative Functional Area Qualification Standard*). As a result of the staff's efforts, as well as those of DOE participants, this key standard was issued expeditiously in April 2002.
- **Emergency Management.** During 2002, the Board's staff provided comments on DOE's draft order on emergency management, DOE O 151.1B, *Comprehensive Emergency Management System.* In addition, the staff reviewed and commented on revisions to an associated DOE Manual addressing programs for coping with: (1) onsite emergencies involving hazardous materials at fixed facilities, and (2) offsite emergencies associated with transportation of hazardous materials in DOE's possession. These revisions, which are key to strengthening DOE's emergency response posture as a result of the events of September 11, 2001, were still pending at the end of FY 2002. The Board will continue to urge DOE to strengthen the emergency management directives to ensure that a fully responsive department-wide emergency management program is in place.

Contractor System Engineers. The Board worked with DOE to develop formal training and qualification requirements for contractor system engineers in response to Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems.* As a result, DOE revised its directives to require the contractors to implement a formal system engineering program. The sites have begun to implement these programs.

Federal Technical Oversight of Safety Systems. In Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems,* the Board urged DOE to identify federal expertise needed to ensure effective oversight of contractor safety systems. In response, DOE's performed an analysis that identified 31 additional personnel were needed for this important function, and that critical technical skills gaps existed in the areas of mechanical engineering, fire protection, electrical engineering, instrumentation and control, and nuclear criticality. Also, DOE determined that the majority of the skill gaps resided in the Office of River Protection, Los Alamos Area Office, Oakland Area Office, and the Y-12 Area Office. The Board and its staff will continue to engage DOE as they recruit, train and qualify federal employees for oversight of the vital safety systems.

Nuclear Criticality Safety Program. The Board continued to stress the need for stable funding for future criticality safety program elements, dedicated emphasis on maintenance of criticality safety engineering training, and the need to minimize the gap in criticality services during the relocation of the Los Alamos Criticality Test Facility. Throughout 2002, the staff conducted onsite reviews of selected facilities at LANL, SRS, and ORNL and observed improving trends in

criticality safety as a result of the Board's efforts under Recommendation 97-2, *Continuation of Criticality Safety at Defense Nuclear Facilities*.

Human Factors Engineering. The staff conducted site-specific reviews and collected complex-wide information related to the use of human factors engineering principles in the evaluation of the appropriateness and effectiveness of administrative controls. In particular, reviews conducted at the Pantex and LLNL Sites in November 2001 and February 2002, respectively, focused on the development, implementation, and verification of selected administrative controls. Further, another safety review at the Y-12 facility in April 2002 indicated a high reliance on administrative controls in lieu of engineered fire protection features. In letters dated January 15, 2002 and May 13, 2002, the Board communicated a number of specific concerns related to the use of administrative controls. As a result of the Board's effort, DOE now recognizes the safety issues, and is working to resolve them.

Contractor Training and Qualification. The Board's staff reviewed the safety basis and supporting programs of the Waste Examination Facility (WEF) at the Nevada Test Site (NTS) in January 2002 and its readiness to begin operations as a Hazard Category 3 (HC-3) nuclear facility. The staff noted that many administrative support programs, such as the training and qualification program, were not adequately developed nor implemented to meet the requirements of nuclear facilities as addressed in *10 Code of Federal Regulations (CFR) Part 830, Nuclear Safety Management*. The training and qualifications did not have the additional rigor necessary for an HC-3 nuclear facility. Training was not adequate for facility operators or outside maintenance support to perform surveillance requirements or pre-operational checks. The Board letter of March 7, 2002, transmitted these observations. DOE's efforts to address the issues is ongoing.

Site-Specific Safety Issue Reviews. At the Hanford Site, a review of the maintenance program at the Spent Nuclear Fuel Project program identified weaknesses which threatened to delay the schedule for removing the fuel from the reactor basins. Similarly, at Y-12, reviews of the maintenance program identified programmatic weaknesses which significantly impaired the effectiveness of the program. As a result of these reviews, DOE and the contractor improved activities which have strengthened both programs. At SRS, a review of the hazards associated with the storage of depleted uranium resulted in a Board reporting requirement and DOE initiatives to consolidate and disposition several metric tons of this hazardous material at the site for safer long term storage.

Recommendation 2000-2. Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems*, addressed the degrading condition of safety systems, calling upon DOE to assess the condition of vital safety systems, designate technically competent system engineers, codify this program in the DOE Directives System, and ensure that DOE possesses the requisite technical expertise to monitor and oversee these systems. In response, DOE completed detailed reviews of vital safety systems that identified equipment degradation as well as programs (such as the drawing control) that needing improvement. DOE is taking steps to address these deficiencies. As a result of the Board's efforts, DOE has taken positive steps to ensure the condition of vital safety systems is understood and controlled.

Unreviewed Safety Question Procedures. The Unreviewed Safety Question (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. This year, the Board initiated a complex-wide review of the USQ process and implementing procedures at Pantex, LLNL, LANL, and SRS, As a result of these interactions, substantial improvements were made to the Pantex Plant's procedure to bring it into compliance with 10 CFR 830.203. In addition, contractor personnel agreed to incorporate specific improvements into future revisions of the LLNL, LANL and SRS procedures.

Integrated Safety Management (ISM) Annual Review Process. The Board's staff continued to monitor the implementation and effectiveness of ISM at defense nuclear facilities. The Board noted that considerable progress had been made in the implementation of ISM, but that continued DOE efforts were necessary to maintain ISM systems to ensure continuous improvement across the complex. The Board communicated specific concerns with the annual ISM review process in letters. In response, DOE will hold a conference to explore methods for strengthening the annual ISM review process and to share lessons learned.

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 2001 Accomplishments

Environment, Safety, and Health Directives. The Board and its staff provided substantive comments to DOE during the review process for 24 directives associated with, but not limited to, integrated safety management, nuclear explosive operations, system engineer program, and line management functions, responsibilities and authorities. At year's end, both staffs were completing resolution of issues on several remaining directives to improve the content, clarity, and consistency in safety requirements and guidance.

Nuclear Safety Rule. The "Nuclear Safety Rule" (10 CFR 830, *Nuclear Safety Management*) was issued in November 2000 after extensive review and comment by the Board. A set of associated implementation guides issued by DOE shortly thereafter incorporated significant improvements suggested by the Board in the selection of TSRs and the identification of safety systems. These changes provide improved guidance to DOE contractors aimed at enhancing the safety of defense nuclear facilities through better identification and maintenance of safety controls.

Safety of Nuclear Explosive Operations. The Board and its staff made significant contributions to the format and content of two DOE Orders associated with the safety of operations involving nuclear explosives: DOE Order 452.1B, *Nuclear Explosive and Weapon Surety Program*; and DOE Order 452.2B, *Safety of Nuclear Explosive Operations*. Both these Orders were issued in August 2001.

Safety Management Functions, Responsibilities, and Authorities Manual. The Board reviewed a draft revision to DOE Manual 411.1-1B, *Safety Management Functions, Responsibilities, and Authorities Manual*, and provided specific suggestions for improvements that were accepted by DOE. These improvements strengthened the role of the DOE Office of Environment, Safety, and Health (EH). For example, the Board urged that EH be given the responsibility for reviewing and approving the use of alternative methodologies for safety analyses by DOE contractors vs. using the "safe harbor" approaches provided in the newly issued 10 CFR 830, *Nuclear Safety Management*.

Contractor System Engineers. The Board provided significant comments to draft Change 4 to DOE Order 420.1A, *Facility Safety*, which is being revised to define requirements for contractor System Engineers in response to Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems*. The Board identified needed improvements, including a more rigorous set of System Engineer qualification requirements, appropriate revision to site contractor procedures to permanently integrate the System Engineer program into the site infrastructure, and a clearer description of the System Engineer's accountability for ensuring that vital safety systems will perform as intended when called upon.

Safety Management Personnel. The Board and its staff continued to assess the competence of key safety personnel at defense nuclear facilities. During a review at LLNL, the staff observed that substantial improvements had been made to the Nuclear Material Technology Program staff who are actively involved in planning and controlling nuclear activities at the facility. At Y-12, the Boards Site Representative, working in concert with a DOE Facility Representative, identified deficiencies in Y-12's program for certification of fissile material handlers and in controlling the actions of workers who had not completed their qualifications/certifications. In February 2001, Y-12 reinstated proper controls over these workers, and as of June 2001, approximately 150 fissile material handlers have been properly reclassified and have completed their certifications.

Federal Technical Capability Program. The Board continued to focus DOE's attention on the technical competence of federal workers. In June 2001, the Board's staff conducted a review of the institutionalization of the Federal Technical Capability Program at the Albuquerque Operations Office (ALO), the Kirtland Area Office, and the Los Alamos Area Office and found that the technical qualification program continued to languish, as previously reported in the DOE Independent Assessment of April 2000. Senior ALO managers subsequently committed to devoting greater attention to the qualifications of their technical staff.

System Engineers. The Board and its staff have urged DOE to develop formal training and qualification requirements for both federal and contractor system engineers in response to Board Recommendation 2000-2, *Configuration Management, Vital Safety Systems*. As a result, DOE has drafted a significant modification to DOE Order 420.1, *Facility*

Examples of FY 2001 Accomplishments

Safety, defining responsibilities and training requirements for contractor system engineers. On the Federal side, the Board and its staff continued to engage DOE in assessing the need and developing criteria for subject matter experts for vital safety systems.

Nuclear Criticality Safety Program. In FY 2001, DOE reported the completion of its implementation plan for Recommendation 97-2, *Nuclear Criticality Safety*, and took action to demonstrate a long-term commitment to maintain a strong nuclear criticality safety program. In February 2001, the Board issued DNFSB/Tech-29, *Criticality Safety at Department of Energy Defense Nuclear Facilities*, documenting reviews of the nuclear criticality safety program at four DOE sites, and highlighting the importance of strong field office oversight of criticality safety programs. The report also identified a number of areas for improvement in the development and maintenance of criticality controls. DOE acknowledged the Board's observations, and is taking action to implement the suggested improvements.

Critical Safety Engineer Qualifications. The Board has played a key role in ensuring comprehensive, high quality standards for training and qualification programs for criticality safety engineers. This year, the Board continued to engage DOE to ensure that at least one qualified DOE criticality safety engineers is assigned to each DOE site, as committed in DOE's Implementation Plan for Recommendation 97-2, *Nuclear Criticality Safety*.

Application of Error Analysis to Authorization Basis Documents. Several DOE contractors argued that the methodology for identification of safety-class and safety-significant structures, systems and components, as set forth in DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*, was overly conservative and espoused an alternative methodology. The Board discouraged use of this alternate methodology in a November 1, 2000 letter, followed by a formal reporting requirement dated April 10, 2001. DOE agreed with the Board's position and prohibited use of this alternate methodology, pending further studies.

Quality Assurance. Board interactions and correspondence with DOE, including three public meetings and the issuance of Board report DNFSB/TECH-31, *Engineering Quality Into Safety Systems*, indicate that DOE's QA Program is not being executed with the rigor required. In response, DOE performed self-assessments of the QA programs throughout the complex and began developing corrective action plans to address identified weaknesses.

Software Quality Assurance. In January 2000, the Board's DNFSB/TECH-25, *Quality Assurance for Safety-Related Software at Department of Energy Defense Nuclear Facilities*, raised issues with the process of developing and maintaining the computer software used for validating and applying design, analytical, and control software. In October 2000, DOE provided a corrective action plan which partially addressed those issues. The Board's two public meetings stressed the importance of software QA and explored approaches used by DoD, NASA, and the chemical and nuclear power industries. DOE is revising their corrective action plans in the context of a broader Quality Assurance improvement plan.

Integrated Hazards Analysis Reviews. Board reviews at several DOE sites indicated that requirements for hazards analyses have not been sufficiently integrated to ensure identification and implementation of adequate controls over the process. Consequently, hazard analyses performed for safety analysis reports, emergency response plans, environmental impact assessments, and fire safety plans may not be adequate. Board letters dated January 1, March 29, and April 30, 2001 identified additional hazards that had been overlooked, improvements needed, and additional controls to improve operational safety.

OBJECT CLASS SUMMARY

Actual obligations for FY 2004, projected obligations for FY 2005, and the Board's Budget Request for FY 2006 are presented by object class accounts in Exhibit A. The Board proposes to utilize the budget resources requested in the following manner:

Salaries and Benefits. The FY 2006 expenditure request includes funding of $15,171,852 to support the projected salary and benefit costs for 100 FTEs. The rationale and justification for the additional salaries and benefits costs are outlined in detail in the executive summary on pages 9 and 10. The additional FTE rationale is detailed in Budget Request Summary (see Introduction). The funding for salaries and benefits represents 68 percent of the Board's FY 2006 estimated obligations. In calculating the projected salary and benefits needs of the Board, the following federal pay adjustment and benefits factors for Executive Branch employees are used:

- Pay increase of 3.5 percent beginning in January 2005
- Pay increase of 2.3 percent beginning in January 2006
- Employee benefits of 26 percent of salaries, or $29,825 per FTE in FY 2004 and FY 2005.

In establishing the Board, Congress sought to bring the best talent available to focus on health and safety oversight questions associated with the design, construction, operation, and decommissioning of DOE defense nuclear facilities. The recruitment and retention of scientific and technical staff with outstanding qualifications are the key components in the Board's human capital strategy if we are to be successful in accomplishing the Board's mission. The Board has assembled a small and highly talented technical staff with extensive backgrounds in science and engineering disciplines such as nuclear–chemical processing, conduct of operations, general nuclear safety analysis, conventional and nuclear explosive technology and safety, nuclear weapon safety, storage of nuclear materials and nuclear criticality safety, and waste management. Essentially all of the technical staff hold technical Masters' degrees and approximately 28 percent hold doctoral degrees. Almost all technical staff members possess practical nuclear experience gained from duty in the U.S. Navy's nuclear propulsion program, the nuclear weapons field, or the civilian reactor industry. In order to accomplish the Board's highly technical mission, it is of paramount importance that the Board receives sufficient funds to meet the salary and benefit requirements of the staff.

The Board maintains its on–site safety oversight of defense nuclear facilities by assigning experienced technical staff members to full–time duty at priority DOE sites. Currently ten full–time site representatives are stationed at six DOE sites: 1) Pantex Plant to oversee nuclear weapons activities, including the weapons stockpile stewardship and weapons disassembly programs; 2) Hanford Site to monitor waste characterization and stabilization and facility deactivation; 3) Savannah River Site to monitor the DOE's efforts to deactivate facilities, stabilize waste materials, and store and process tritium; 4) Oak Ridge Y–12 Complex to monitor safety and health conditions at Y-12 and other defense nuclear facilities in the area; 5) Los Alamos National Laboratory (LANL)

to advise the Board on overall safety and health conditions at LANL, and to participate on Board reviews and evaluations related to the design, construction, operation, and decommissioning of LANL defense nuclear facilities; 6) Lawrence Livermore National Laboratory (LLNL). During FY 2004, the Board reviewed the potential risks to the public and the environment at LLNL and stationed a full-time site representative at this site.

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

Travel. The Board requests $703,000 to support the official travel of the Board Members and staff. Extensive travel is necessary to the various DOE defense nuclear facilities located throughout the United States in order for the Board Members and staff to conduct first-hand assessments of operations and associated health and safety issues. The Board is required to react to incidents at the DOE defense nuclear facilities that may affect public health and safety, requiring unplanned travel expenditures to support its work at these sites. Board Members, technical staff and the Board's outside technical experts made 423 visits during FY 2004 to major defense nuclear sites in support of its high priority public health and safety oversight mission.

The Board is also authorized to station staff members at DOE sites or facilities during critical construction and testing periods. The Board has assigned technical staff teams to round–the–clock monitoring of major start–up, testing, or restart activities at various DOE sites. The presence of its technical staff has proved to be invaluable in providing the Board with firsthand information on the demonstrated readiness, capabilities, and performance of the DOE and its contractors for ensuring safety in the conduct of such activities. During the coming fiscal years, the Board anticipates a continued increase in travel for Board technical staff teams to monitor construction and start-up of new DOE defense nuclear facilities, such as the Hanford Waste Treatment Facility in Richland, Washington and the Highly Enriched Uranium Materials Facility in Oak Ridge, Tennessee.

Travel funds are also used to pay for Board expenses associated with public hearings and meetings at or near DOE sites, where any interested persons or groups may present comments, technical information, or data concerning health and safety issues under Board .

Transportation of Things. The Board has included $200,000 in its FY 2006 Budget Request for the shipment of household goods for employees relocating to the Washington, DC area or to become site representatives at DOE facilities.

Rental Payments to GSA. The Board requests funds totaling $2,500,000 to reimburse the General Services Administration (GSA) for projected office rental costs. This overhead expense represents approximately 11 percent of the Board's FY 2006 Budget Request. This annual rent estimate has been increased, as the current lease was negotiated 10 years ago and GSA Public Building Services estimates that annual rental costs at 2006 rates will be $2,800,000 per year. The

Board is requesting only $2,500,000 for FY 2006 because five months of FY 2006 will still be under the current lease that expires in March of 2006.

Communications and Utilities. The FY 2006 Budget Request includes $154,500 for projected communications support costs. Funds in this account will be used for telephone services, Internet access charges, postage costs, special messenger services, and equipment rentals. Contracts for emergency communications services for the Board Headquarters, site representatives and the Board's alternate Continuity of Operations Facility (COOP) are also included in this account.

Printing and Reproduction. The budget request includes $27,000 for reimbursing the U.S. Government Printing Office for publication of the required legal notices in the *Federal Register.* Routine printing and copying charges, including the Board's *Annual Report to Congress* and technical reports, are also included in this account.

Consulting Services. Although the Board's enabling legislation authorized the hiring of up to 150 FTEs, due to budgetary constraints, the Board is operating with a ceiling of 100 FTEs and due to staff attrition, employed only 93 full-time staff as of January 30, 2005. The Board maintains a highly skilled staff, but it is not economically feasible to maintain multiple permanent staff in very specialized technical disciplines. Therefore, it is necessary to have the funds available to immediately contract for this expertise when needed. For example, extensive use of technical consultants has been necessary to review complex design and construction of the High Level Waste Treatment Facility at Hanford. This includes seismic analysis, structural loading and review and approval of construction plans to ensure the safety of this $6 billion project. The Board obtains specialized contractor expertise in a variety of technical disciplines to augment its internal review capability and avoid any unnecessary impact on DOE's construction schedule.

The Board plans to continue contracting for technical expert services in highly specialized disciplines such as: lightning protection, geotechnical investigation and seismic/structural engineering. Should an unexpected imminent or severe threat to public health and safety be identified, this expertise may be required for short durations. Each technical expert that the Board employs will continue to be carefully screened for possible conflict of interest.

A list of major technical support contracts, with a brief description of each contractor's areas of expertise, and a chart which reflects funding levels for this support are included on pages 69 through 72. The FY 2006 Budget Request includes $1,000,000 in this account for technical support contracts to assist the Board in its health and safety reviews. This represents a 25 percent reduction from 2004 obligations for outside technical expertise.

Other Services. The budget request includes $1,602,000 to fund a wide range of recurring administrative support needs of the Board in FY 2006 such as physical security, cyber security, employee training, information technology support, court reporting, records storage and retrieval, and drug-free workplace testing and support.

Government Services. The Board's budget request includes $374,000 for reimbursable support agreements with other federal agencies to provide services such as: accounting, payroll, health unit, employee background investigations for security clearances, Employee Assistance Program services, the Library of Congress' FedLink for legal and legislative research, and Defense Contract Auditing Agency (DCAA) services to assist in determination of fair and reasonable contracting costs.

Supplies and Materials. The Board requests $295,000 for continued access to numerous technical standards databases, legal research services, maintenance of the technical reference information for its library, and for general office supplies and materials. This represents a reduction of 5 percent from FY 2004 obligations for supplies and materials. This reduction in cost was accomplished through an agency-wide review of research materials usage, elimination or reduction of services available from other sources and competitive negotiations with vendors.

Equipment. The FY 2006 Budget Request includes $250,000 to replace outdated office equipment such as printers, copiers and graphic presentation equipment. Since maintenance contracts on outdated equipment are very costly, upgraded equipment is purchased "bundled" with maintenance contracts at little or no additional cost. This procurement strategy improves the efficiency of operations, reduces overall costs, and eliminates down time. In addition, the Board plans to purchase upgraded cyber security equipment, improved communications equipment and support equipment for site representatives. This request represents a reduction of 34 percent from FY 2004 obligations in this account. This reduction was accomplished through negotiation of multi-year software licenses and implementation of a standardized plan for desktop platforms and servers. The standardization plan enabled the Board to negotiate with vendors and take advantage of cost savings through economies of scale.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

2006 CONGRESSIONAL BUDGET REQUEST, 02-01-05

BUDGET ACCOUNT	COST ELEMENT	FY 2004 OBLIGATIONS (ACTUAL)	FY 2005 PROJECTED FINANCIAL PLAN	FY 2006 PROJECTED BUDGET REQUEST
PERSONNEL SALARIES -- (11)		$ 11,174,976	$ 11,415,464	$ 11,773,261
PERSONNEL BENEFITS -- (12)		$ 3,349,479	$ 2,957,106	$ 3,398,591
TRAVEL -- (21)		$ 777,879	$ 703,000	$ 703,000
TRANSPORTATION OF THINGS -- (22)		$ 188,729	$ 105,000	$ 200,000
RENTAL PAYMENTS TO GSA -- (23.1)		$ 2,252,735	$ 1,942,634	$ 2,500,000
COMMUNICATIONS & UTILITIES (23.3)		$ 117,989	$ 144,000	$ 154,500
PRINTING & REPRODUCTION -- (24)		$ 23,403	$ 24,000	$ 27,000
CONSULTING SERVICES -- (25.1)		$ 1,339,627	$ 1,000,000	$ 1,000,000
OTHER SERVICES -- (25.2)		$ 1,671,580	$ 1,457,030	$ 1,602,000
GOVERNMENT SERVICES -- (25.3)		$ 273,464	$ 331,500	$ 374,000
SUPPLIES & MATERIALS -- (26)		$ 310,956	$ 285,000	$ 295,000
CAPITAL ASSETS -- (31)		$ 378,211	$ 250,000	$ 250,000
*** TOTAL OBLIGATIONS ***		$ 21,859,029	$ 20,614,734	$ 22,277,352
NEW BUDGET AUTHORITY		$ 19,443,602	$ 20,105,856 *	$ 22,032,000
UNOBLIGATED BALANCE - PREV. FY		$ 2,477,974	$ 982,341	$ 473,462
RECOVERY OF PRIOR YR OBLIGATIONS		$ 921,071	$ -	$ -
TOTAL BUDGETARY RESOURCES		$ 22,842,647	$ 21,088,197	$ 22,505,462
EST. UNOBLIGATED BAL. - CUR. FY		$ 982,341	$ 473,462	$ 228,110
APPROPRIATION		$ 19,443,602	$ 20,105,856	$ 22,032,000
OUTLAYS		$ 20,936,931	$ 20,202,440	$ 21,831,805
STAFF & BOARD MEMBERS (FTE'S)		97	100	100

*$20,268,000 appropriation; $162,144 rescission

Exhibit A

TECHNICAL SUPPORT CONTRACTS SUMMARY

A list of major technical support contracts, with a brief description of each contractor's areas of expertise, follows. The FY 2006 Budget Request includes $1,000,000 in this account for technical support contracts to assist the Board in its health and safety reviews.

DEFENSE NUCLEAR FACILITIES
SAFETY BOARD

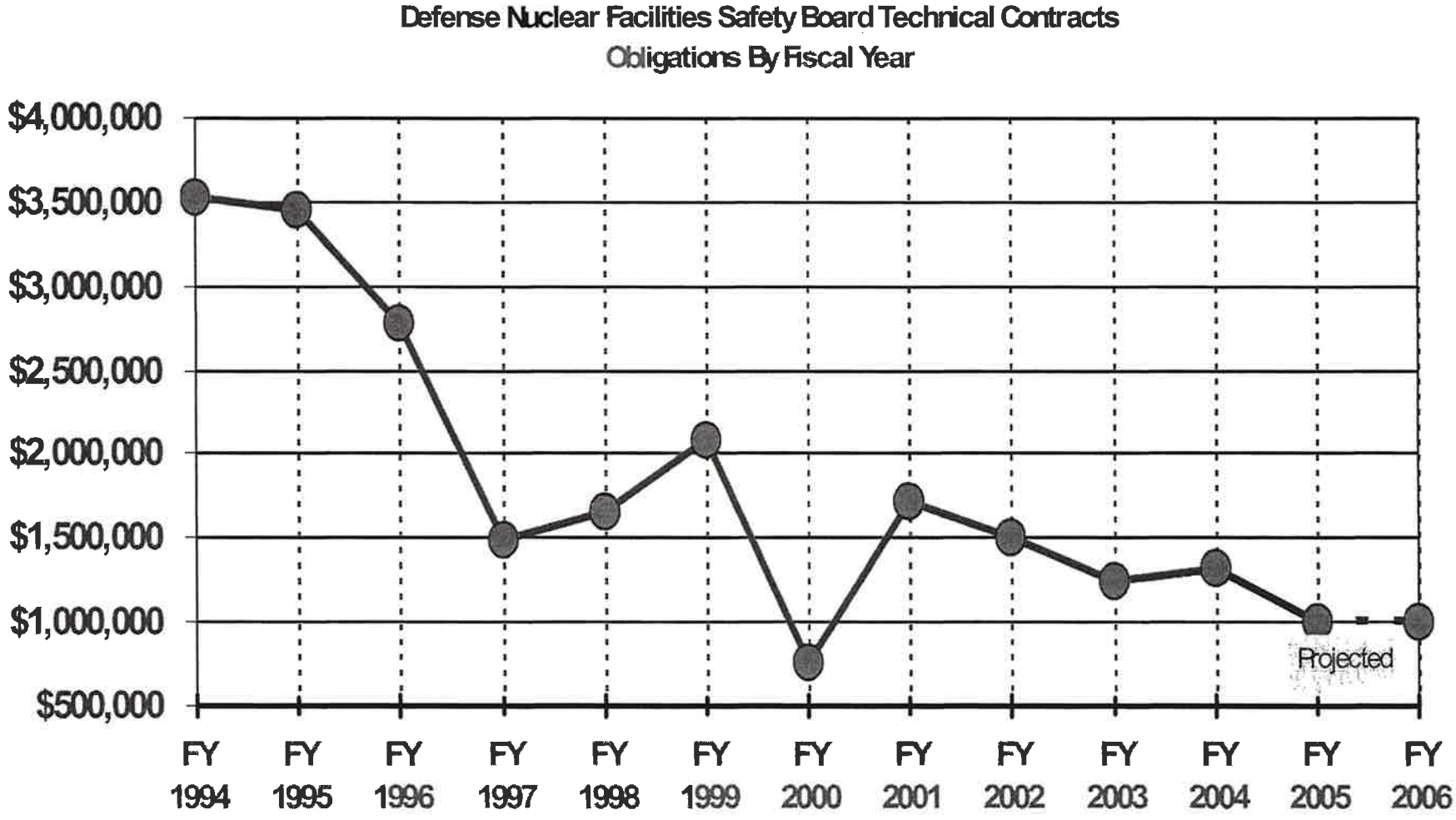
TECHNICAL SUPPORT CONTRACTS
(Status as of 01/30/05)

CONTRACTOR	CONTRACT EXPIRATION DATE	DESCRIPTION OF WORK
Dr. Harold Agnew	12/15/05	Provide technical expertise related to assembly, disassembly and testing of nuclear weapons. These services include assisting the Board in oversight activities at facilities charged with disassembly, safe handling, and storage of nuclear weapon systems.
Mr. Richard Collier	09/30/05	Provide expertise related to lightning safety issues at DOE's defense nuclear facilities. These services include assisting the Board in review, analysis and modeling of lightning protection systems. Examples of work include analysis of the risk presented by lightning in explosive areas and in and around large structures.
Mr. Joseph DiNunno	10/13/05	Provide technical assistance in reviewing, evaluating, and advising the Board on various issues related to Integrated Safety Management (ISM) programs at defense nuclear facilities.
Dr. Kevin J. Folliard	10/10/05	Provide expertise related to performance of structures during normal and extreme loading events, natural phenomenon events, and application of national consensus codes and standards. These efforts are primarily focused on concrete chemistry in construction designs.
Dr. James Jirsa	06/30/05	Provide technical support to the Board, specifically in review and evaluation of concrete structures. These efforts include review of construction designs for structural performance during normal and extreme loading events, natural phenomenon events, and application of national consensus codes and standards.

CONTRACTOR	CONTRACT EXPIRATION DATE	DESCRIPTION OF WORK
Dr. Herbert Kouts	12/31/05	Provides technical expertise on a wide range of subjects associated with safety at DOE's defense nuclear facilities, including: safety management, criticality, stabilization, storage and disposition of nuclear materials, nuclear reactor physics, various issues related to nuclear facilities safety engineering, evaluation of DOE's implementation of Board recommendations and integrated safety management and protection of workers and the public in support of the Board's oversight authority.
Dr. Joseph A. Leary	12/31/05	Provide technical support to the Board, specifically involving review of operations and nuclear technology at facilities involved in processing and handling of nuclear materials. Examples of work include: evaluation of technologies to stabilize plutonium residues and plutonium storage safety issues.
Dr. James L. Liverman	06/30/05	Provide technical support to the Board in the general subject area of Integrated Safety Management (ISM), quality assurance and radiation protection, specifically involving review and evaluation of amendments to 10 CFR 835 Rule, radiological protection standards, other radiological and environmental health and safety issues, and reviewing the development of DOE's quality assurance improvement plan.
Management Support Technology, Incorporated	02/28/05	Provides technical support to the Board, specifically involving the evaluation of directives and procedures governing operation and maintenance of defense nuclear facilities. In addition, provides technical support evaluating the implementation of Integrated Safety Management for ongoing operations and maintenance, and also preparations for startup or restart of defense nuclear facilities. Recent work involved reviewing readiness preparations for startup of defense nuclear facilities at the Pantex Plant, the Y-12 Security Complex, and the Hanford Site, as well as DOE's implementation of Integrated Safety Management.

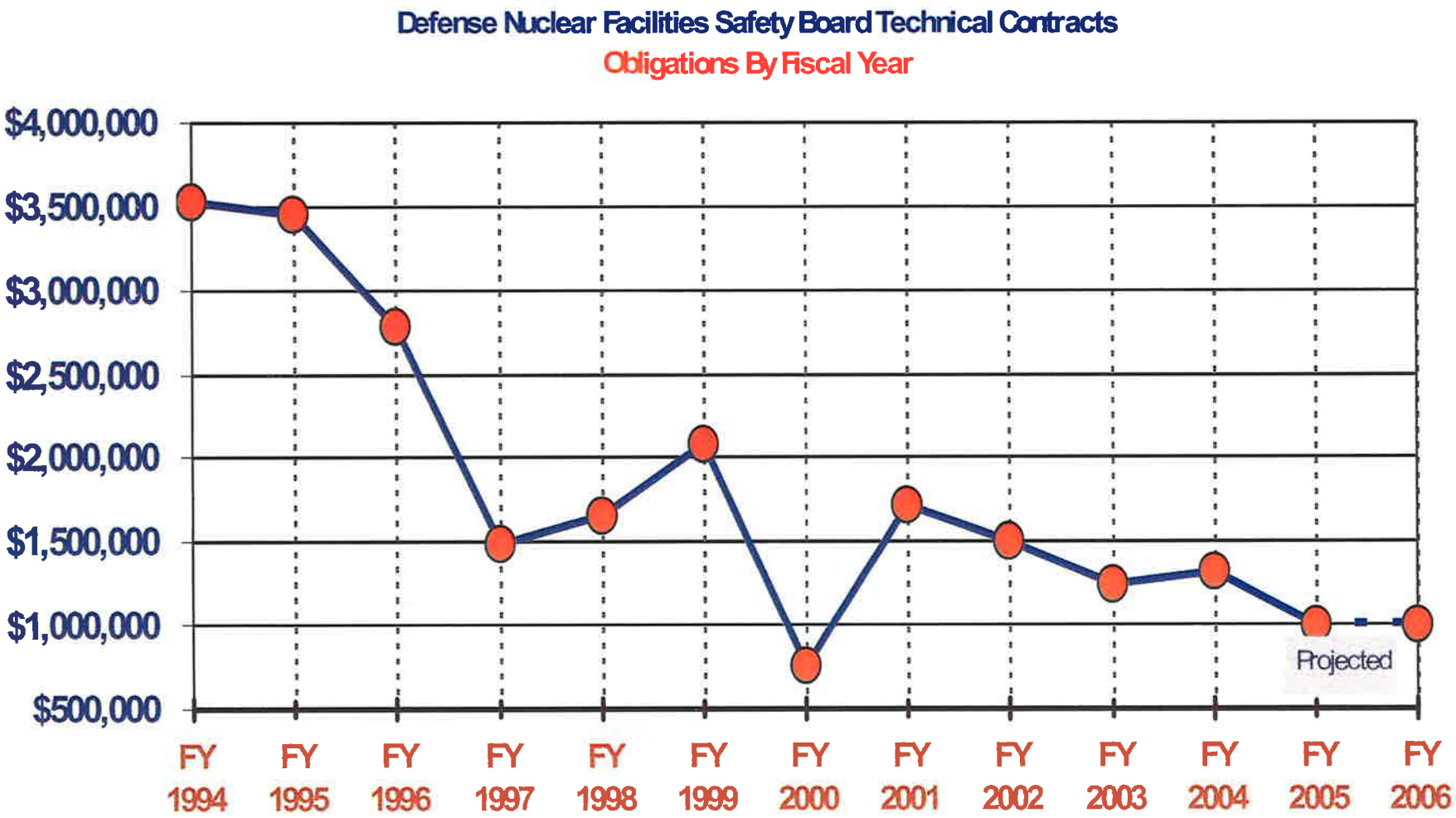
CONTRACTOR	CONTRACT EXPIRATION DATE	DESCRIPTION OF WORK
Mr. Lary M. McGrew	01/31/05	Provide expertise related to safety issues associated with those facilities involved in the assembly, disassembly, and testing of nuclear weapons systems. Specifically, advise the Board from direct experience in conventional and nuclear explosive technology and safety, nuclear materials handling and storage, criticality safety, and nuclear weapons assembly, storage and testing. Recent work has included, for example, review of the W79 and W56 dismantlement processes and the W78 and W88 assembly and disassembly and inspections at the Pantex Plant.
Paul C. Rizzo Associates, Inc.	12/31/05	Provide technical support to the Board, specifically in the review and evaluation of systems and seismic engineering of structures, systems and components with particular emphasis on: geotechnical investigation and soil mechanics; systems engineering; adequacy of various types of analyses performed by DOE contractors; seismological hazards; safety analysis; hydrology; and environmental related issues.
J.D. Stevenson, Consulting	12/31/05	Provide technical support to the Board, specifically in the review and evaluation of systems and seismic engineering of structures, systems and components with particular emphasis on: applicability and content of orders and standards developed by DOE and its contractors as well as existing codes and standards used at DOE utilities, applicability of commercial nuclear industry standards as they apply to DOE facilities; quality assurance related matters; adequacy of various types of analysis performed by DOE contractors; and hazard and systems classification.

CONTRACTOR	CONTRACT EXPIRATION DATE	DESCRIPTION OF WORK
Briere Associates, Inc.	09/30/05	Provide technical editing services of Board documents that include, but are not limited to technical reports, issue reports, the Board's Reports to Congress, and formal Board Recommendations to DOE. These services include analyzing manuscripts in terms of its objective, style, and manner of presentation and recommending revisions as appropriate.


Defense Nuclear Facilities Safety Board Technical Contracts
Obligations By Fiscal Year
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
FY 1994
FY 1995
FY 1996
FY 1997
FY 1998
FY 1999
FY 2000
FY 2001
FY 2002
FY 2003
FY 2004
FY 2005
FY 2006
Projected

Lease Cost Analysis Summary

	Moving Cost Summary					
	Square footage currently required by the Board		56,457	RSF		
	Rentable Useable (RU) Factor = 1.11079		1.11079	R/U Factor		
	Useable Square Footage (56,457 / 1.11079)		50,826	USF		
	Common Area = Rentable Square Footage less Useable Square Footage (56,457 - 50,826)		5,631	Common Area		
	First Year (one time costs)					
	Physical Move & Lost Productivity	SQ FT factor		Extended Cost		
1	Physical Move (per Sq ft.) ($5 * 50,826)	$	5.00	$ 254,130		
2	Telecommunications (per Sq ft.)	$	10.00	$ 508,260		
3	General Security Replication (per Sq ft.)	$	6.00	$ 304,956		
				$ 1,067,346	$	1,067,346
	Lost Productivity	Hours				
4	Government Packing/Unpacking (48 hrs per person * 100 Employees @ $68 per hr)		48	$ 326,400		
5	Contractor Packing/Unpacking (48 hrs per person * 20 contractors @ $37.50 per hr)		48	$ 36,000		
				$ 362,400	$	362,400
		SQ FT factor				
6	Tenant Improvements over and above Customization level Tier 2 ($38.30) replicating the sunk costs of building out to Board's requirements. (not amortized)	$	36.70	**$ 1,359,405**	$	1,359,405
	First Year Physical Move & Lost Productivity cost Subtotal			**$ 2,789,151**	**$**	**2,789,151**
	Tenant Improvement Replication	SQ FT factor				
7	Tenant Improvement for Secure Vault Space on the 4th and 8th Floors (replication factor from GSA) (356 SFof classified Vault Space X $1,000 to replicate)	$	1,000	$ 356,000		
	Interest for amortizing Secure Vault Space TIs over 10 Years (Rate from OMB A-94)		4.60%	$ 88,805		
				$ 444,805	$	444,805
8	Tenant Improvement for 13,429 SF of Specialty Space (replication factor from GSA) (13,429 SF * $200 per SF)	$	200	$ 2,757,000		
	Interest for amortizing Specialty Space TIs over 10 Years (Rate from OMB A-94)		4.60%	$ 687,743		
				$ 3,444,743	$	3,444,743
9	Tenant Improvement for Standard Office Space (50,826 USF less 356 SF Vault Space less 13,429 SF of specialty space = 37,041 SF Useable Office Space) customization level Tier 2 buildout over Warm lit shell.	$	38.30	$ 1,418,670		
	Interest for amortizing Office Space TIs over 10 Years (Rate from OMB A-94)		4.60%	$ 353,892		
	37,041			**$ 1,772,563**	$	1,772,563
10	Architect/ Design Services (including an architect to lead the program and oversee buildout)	$	250,000	$ 250,000		
	Interest for amortizing Architect/ Design Services over 10 Years (Rate from OMB A-94)		4.60%	$ 62,363		
				$ 312,363	$	312,363
	Tenant Improvement Replication SubTotal			**$ 5,974,475**	**$**	**5,974,475**
	Tenant Improvement Replication SubTotal per year over 10 Years			**$ 597,447**	**$**	**597,447**
11	**Total Estimated Relocation Costs (Physical Move and Tenant Improvement Replication) (A+B)**			**$ 8,763,626**	**$**	**8,763,626**
	Rent Estimate FY 2006 Shell and Operating of $46 per SF	$	46.00	**$ 2,597,022**		
	Total Estimated Yearly Rent (Annual Shell and Operating Rent plus TI Amortization) ($2,597,022 + $597,447)			**$ 3,194,469**		
	Plus 8% PBS fee		8%	**$ 255,558**		
12	**Total Estimated Annual Rent 2006-2016 If Board is relocated (Shell/Operating/TI & Security Allowance& PBS Fee)**	**$**	**61.11**	**$ 3,450,027**	**$**	**3,450,027**
13	**Current FY 2004 Rent @ 625 Indiana Ave, with PBS Fee and all TIs amortized**	$	34.90	**$ 2,252,000**		
14	**Total Estimated Annual Rent 2006-2016 If Board remains @ 625 Indiana Ave (Shell/Operating/& PBS Fee)**	**$**	**49.68**	**$ 2,804,784**	**$**	**2,804,784**
		Relocating			**Remaining @ 625**	
	Increase over current annual rent of $34.90 per square foot $	$	1,198,027		$	552,784
	Increase over current annual rent of $34.90 per square foot %		53.2%			24.5%
15	**First Year (one time costs)**	$	2,789,151		$	-
16	FY 2006 BA increase (in $) to absorb one time costs and 1st year rent increase	$	3,987,178		$	552,784
	Increase to Total BA for FY 2006 %		**20.5%**			**2.8%**
17	FY 2007- FY 2016 Increase to Total Budget Authority required annually for years 2 through 10 to absorb rent increase and Amortize TI Replications	$	1,198,027		$	552,784
			6.2%			**2.8%**
	FY 2004 Budget Authority Total	**$**	**19,443,000**		**$**	**19,443,000**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FY 2006

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		6.2%			**2.8%**
	FY 2004 Budget Authority Total	**$ 19,443,000**		**$**	**19,443,000**

COST ANALYSIS ON NEW OFFICE LEASE OPTIONS

The Board's ten-year lease at 625 Indiana Avenue, NW expires on March 6, 2006. On April 23, 2003, the Board's Chairman notified GSA's Public Building Services (PBS) of the Board's "continuation of need" to occupy its present location after the expiration of the current lease.

The Board conducted a lease cost analysis in accordance with OMB Circular A-94, "*Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs.*" This cost analysis confirms that a relocation of the Board to new space would create an enormous and unnecessary financial burden. These costs can be avoided if a Succeeding Lease at 625 Indiana Avenue, NW is negotiated by PBS, allowing the Board to remain in its current facility. Our lease cost analysis on the following page illustrates that amortization of the cost to replicate the Board's existing build-outs for security and other mission critical needs would increase the Board's rent expenses in excess of 53 percent annually. Further, absorbing the cost for these tenant improvements, coupled with the cost of the physical move, telecommunications, information technology security and physical security infrastructure replications would require the Board to request a Budget Authority (BA) increase in the first year of a new lease in excess of 20 percent (nearly $4,000,000). This financial impact would continue in years two through ten, assuming a ten-year lease, at an estimated 6.2 percent overall increase in BA ($1,200,000 annually). The total ten-year cost is estimated to exceed $8,700,000.

The Board has leased office space at its current location since 1990 and established our need to remain at this location for several reasons. Among these is the considerable expense the Board has incurred in security modifications necessary to perform the Board's health and safety oversight mission associated with the assembly, disassembly and testing of nuclear weapons. Additionally, the Board's enabling legislation requires it to work closely with the Department of Energy (DOE). Presently, the Board is located within convenient walking distance of DOE's Headquarters at the Forrestal building, at 1000 Independence Avenue, SW.

As no additional space at 625 Indiana Avenue, NW is needed, and no further build-out or construction to the current space is anticipated. Therefore, a significant cost avoidance will be realized if GSA negotiates a lease at prevailing market rates, allowing the Board to remain at its current location.

In light of the current federal budgetary deficits, it is not reasonable to expect that additional budgetary resources would be made available to the Board to absorb these costs. Incurring such costs, when they are avoidable, are not supportable as a sound use of public funds when OMB's A-94 guidelines for evaluating the cost of federal programs are applied.