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**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**

Washington, DC 20004-2901

November 30, 2017

Via E-Mail

Re: DNFSB FOIA Request 17-27

This letter is an interim response to the Freedom of Information Act request you submitted to the Defense Nuclear Facilities Safety Board (sequential tracking number FY 17-27) asking for copies of the agency's Congressional Budget Justifications/Congressional Budget Requests for fiscal years 2000 through 2006.

We previously advised you that those records had been transferred to the National Archives and Records Administration for storage, and that we would ask that they be returned to us for processing in response to your FOIA request. To date, we have received the 2005 and 2006 budget requests and are providing you with unredacted PDF copies of those documents.

We have renewed our request with NARA for the return of the budget requests for FY 2000 through FY 2004, and when we receive them, we will process them for release as expeditiously as possible.

In the interim, if you have any questions about this request, feel free to get in touch with our FOIA Public Liaison, Paul Wilson, at any time. He can be reached by phone at 202-694-7000 (toll-free at 800-788-4016) or by e-mail at FOIA@dnfsb.gov. Please include the tracking number of this request – FY 17-27 – in any such communication.

Sincerely,

Katherine R. Herrera
Freedom of Information Act Officer

Enclosure



**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**

Washington, DC 20004-2901

November 30, 2017

Via E-Mail

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Sincerely,

Katherine R. Herrera
Freedom of Information Act Officer

Enclosure

**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**

Washington, DC 20004-2901



September 19, 2018

Via E-Mail

Re: DNFSB Freedom of Information Act Request FY 17-27

This letter is the Defense Nuclear Facilities Safety Board's final response to Freedom of Information Act request FY 17-27, which asked for "an electronic copy of the DNFSB Congressional Budget Justification/Congressional Budget Request for the fiscal years 2000 through 2006."

We previously provided you with copies of the budget requests for FY 2005 and FY 2006 and told you that we would continue to search for the documents submitted for fiscal years 2000 through 2004. Following extensive search efforts, we have located copies of those budget requests, and you will find unredacted copies of the four documents attached to this letter.

Our response to your request is now complete. We regret the delay in providing you with this response and waive all fees associated with your request. If you have any questions about our response, feel free to contact our FOIA Public Liaison, Paul Wilson. You can reach him by telephone at 202-694-7000 (toll free at 800-788-4016) or by e-mail at FOIA@dnfsb.gov. Please be certain to provide your request's tracking number, FY 17-27, in any future communications with this office regarding your request.

Very truly yours,

A handwritten signature in black ink, appearing to read "Glenn Sklar", written over a horizontal line.

Glenn Sklar
Chief FOIA Officer

Attachments

FY 2000 & FY 2001 BUDGET REQUEST TO THE CONGRESS

Defense Nuclear Facilities Safety Board



February 1999

**Defense Nuclear Facilities
Safety Board
FY 2000 & FY 2001 Congressional Budget Request**

APPROPRIATION & EXPENSE SUMMARY

(Tabular dollars in thousands).

OPERATING EXPENSES

	ACTUAL FOR <u>FY 1998</u>	PROJECTED FOR <u>FY 1999</u>	BUDGET REQUEST FOR <u>FY 2000</u>	BUDGET REQUEST FOR <u>FY 2001</u>
New Budget Authority	17,000	16,500	17,500	17,500
Obligations	16,582	17,565	18,540	18,353
Outlays	16,611	16,600	17,500	17,500

Authorization: National Defense Authorization Act, Fiscal Year 1989 (amended the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) by adding new Chapter 21 -- Defense Nuclear Facilities Safety Board.

National Defense Authorization Act for Fiscal Year 1991
(P.L. 101-510-Nov. 5, 1990),
National Defense Authorization Act for Fiscal Years 1992 and 1993
(P.L. 102-190-Dec. 5, 1991),
Energy Policy Act of 1992
(P.L. 102-486-Oct. 24, 1992), and
National Defense Authorization Act for Fiscal Year 1994.
(P.L. 103-160-Nov. 30, 1993).

**Defense Nuclear Facilities
Safety Board
FY 2000 & FY 2001 Congressional Budget Request**

PERSONNEL SUMMARY

	<u>FY 1998 ACTUAL</u>	<u>FY 1999 BUDGET PLAN</u>	<u>FY 2000 BUDGET REQUEST</u>	<u>FY 2001 BUDGET REQUEST</u>
Statutory Personnel Ceiling: (FTE's) ^{1/}	150	150	150	150
FTE Usage ^{2/}	99	106	106	106
<hr/>				
Board Members & Permanent Employees at End of Fiscal Year ^{1/}	100	106	106	106

^{1/} National Defense Authorization Act for FY 1992 and FY 1993, P.L. 102-190, raised the Board's statutory employee ceiling from 100 to 150 full-time staff to accommodate mandated additional nuclear weapons safety 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(A).

^{2/} Includes 5 full-time Board Members.

**Defense Nuclear Facilities
Safety Board
FY 2000 & FY 2001 Congressional Budget Request**

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, [16,500,000] \$17,500,000, to remain available until expended. Further, for the foregoing purposes, \$17,500,000, to become available on October 1, 2000 and remain available until expended. (*Energy and Water Development Appropriations Act, 1999*)

**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD
FY 2000 & FY 2001 CONGRESSIONAL BUDGET REQUEST**

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**Defense Nuclear Facilities
Safety Board**
FY 2000 & FY 2001 Congressional Budget Request

1. EXECUTIVE SUMMARY

The Defense Nuclear Facilities Safety Board's (DNFSB or Board) FY 2000 Budget Request is for \$17,500,000 and 106 Full-time Equivalent (FTE) staff years.

This request is equal to the amount of resources requested for the Board in the President's FY 1999 Budget to the Congress. Barring a change in current U.S. national security policy or other unforeseen incident affecting the Department of Energy's (DOE) defense nuclear programs, an FY 2000 appropriation of \$17,500,000 should be sufficient to offset recent cost-of-living pay adjustments raising staff salaries and benefits, and an increase of 28% in the GSA billing for leased office space. Cost-of-living pay adjustments are non-discretionary costs over which the Board has no control.

The Board currently is operating at 2/3 of its statutory employment ceiling. Therefore, this budget is the minimum needed for the Board to conduct adequately its statutorily mandated public and worker health and safety mission and maintain emergency funds to respond, if necessary, to a serious accident at a DOE defense nuclear facility.

1.1 RESOURCE NEEDS VS. FISCAL CONSTRAINTS

As clearly recognized by the Congress when establishing the Board, the ability to effectively carry out an independent, technical oversight program throughout the DOE weapons complex rests on the technical capability of the Board Members and staff.

The conferees believe that the DNFSB is a unique Federal agency, in that its mission (is) to oversee the activities of another federal department whose work is highly technical and potentially dangerous, and that to properly carry out its mission, not only the DNFSB members but also its limited staff must be technically competent in all major phases of nuclear safety.¹

To establish a credible, external oversight organization, the Board's original legislation authorized a work force of 100 full-time employees, but that number was increased by the

¹ National Defense Authorization Act for Fiscal Year 1991, Conference Report, Title XXXII, October 23, 1990.

Congress and the President to 150 when Public Law 102-190 significantly expanded the Board's safety oversight responsibilities over the assembly, disassembly, and testing of nuclear weapons.

Due to current funding constraints, the Board has been forced to prioritize its efforts on the higher risk activities of the Department and to reduce its staff through attrition to 90 employees as of December 31, 1998, well below the Board's statutory employment ceiling of 150 full-time staff.² In addition, the Board has reduced expenditures for outside technical experts, and instituted other cost saving measures. The funding for salaries and benefits represents 74 percent of the Board's FY 2000 Budget Request for \$17.5 million (see Figure 1 and Appendix B, Exhibit A for a presentation by object class accounts). As a small agency, it is very difficult for the Board to absorb budget reductions without directly impacting its technical staff oversight capability, and compromising its statutory mission.

The recruitment and retention of scientific and technical staff with outstanding qualifications have and will continue to be critical to the successful accomplishment of the Board's mission. Through the use of excepted service hiring authority and a carefully structured recruiting program, the Board has succeeded in building a technical staff capability that includes individuals with extensive experience in nuclear, mechanical, electrical, chemical, structural, and metallurgical engineering, and in physics. As an indication of the Board's technical talent, 25 percent of the technical staff hold degrees at the Ph.D. level and an additional 72 percent have masters degrees. Almost all technical staff members, except interns, 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 providing guidance on priorities for the Board's oversight operations, the House Energy and Water Development Appropriations Committee Report accompanying the FY 1999 Appropriations Bill included the following instructions:

The Committee urges the Board to focus on those defense nuclear production facilities that are operational and represent the highest radiological risk to workers and the public.

In deference to the Committee's instructions, the Board plans to continue its efforts to conserve resources whenever possible without compromising its mandated public and worker health and safety oversight mission, as the DOE proceeds with its plans to spend billions of dollars on design, construction, operation, and decommissioning activities in FY 2000 and beyond. As presented in this budget request, the workload of the Board is prioritized to focus primary attention on the most hazardous DOE operations and complex-wide health and safety issues, consistent with the Board's enabling statute, safety oversight approach, and strategic plan.

² Excludes 5 Board Members appointed by the President and confirmed by the Senate.

1.2 SAFETY OVERSIGHT STRATEGY

Maintaining an effective safety oversight program that fulfills the broad mandates of the Board's enabling legislation (see Appendix A) with the constrained budgetary situation described earlier requires a constant reassessment of health and safety conditions throughout the DOE defense nuclear complex. Sources of information used by the Board in making its assessments, evaluations, or recommendations to the Secretary of Energy are varied. They include testimony from public hearings and meetings, site representative reports, staff issue papers, site visits, implementation plans for the Board's recommendations, responses to reporting requirements, and correspondence from workers and union representatives at the DOE sites. Based on the Board's assessment of the risks and the potential impact to public or worker health and safety, priorities will change resulting in revised staff technical review assignments.

Based on nine years of operating experience, the Board has developed a strategy for maximizing the effectiveness of its resources by executing its safety oversight responsibility according to the following principles:

- The primary responsibility for ensuring protection of the health and safety of the public and workers, and protection of the environment belongs with DOE line managers and extends in an unbroken chain from the Secretary of Energy to the workers on the floor.
- As an external "action-forcing" agency, the Board influences DOE line management actions to the extent needed to achieve safety objectives.
- Effective safety management demands that safety expectations be clearly defined and tailored to specific hazards at all levels—site, facility, or activity.
- Technical expertise is required to define controls commensurate with the identified hazards and to ensure compliance.
- Safety oversight activities will be prioritized by perceived risks to the public, the workers, and the environment. Key indicators are the types and quantities of nuclear material at risk and the processes and setting of the operations involved.
- Safety oversight responsibilities for defense nuclear facilities will be accomplished in full cooperation with other agencies, such as individual states and the EPA for final cleanup, demolition, and environmental restoration activities, in compliance with responsibilities mandated by the Atomic Energy Act of 1954, as amended, and the federal environmental laws, including CERCLA and RCRA.

Various Executive Orders, including E.O. 12862, *Setting Customer Service Standards*, have stressed the need for Executive Branch agencies to be sensitive to the need for public involvement. The Board has used open public meetings and hearings as a forum for public awareness and communication on Board activities. The Board has continued its practice of meeting with state and local officials, labor leaders, DOE facility workers, public interest groups, and area residents to exchange information and inform interested parties of the Board's work.

Public meetings and hearings to educate and assure the public of safety precautions and other Board oversight activities have been held by Board Members in the vicinity of DOE defense facilities at the Hanford Site, Savannah River Site, Oak Ridge Site, Rocky Flats Environmental Technology Site, Pantex Plant, Idaho National Engineering and Environmental Laboratory, Fernald Environmental Management Project/Mound Plant, Sandia/Los Alamos National Laboratories, and Lawrence Livermore National Laboratory. To date, a total of 31 have been held at or near DOE sites and 33 in Washington, D.C., the records of which have been made available to the public.

1.3 SAFETY OVERSIGHT IN PRACTICE

Examples of the Board's contributions to public and worker health and safety, resulting from the practical application of the above safety oversight principles, include the suspension of efforts to restart the In-Tank Precipitation Facility (ITP) at the Savannah River Site; the safe restart of Enriched Uranium Operations at Oak Ridge Y-12; the improvements in the design and construction of stockpile management facilities at the Los Alamos National Laboratory; and the resolution of safety-related Suspect/Counterfeit Parts Issue. A more detailed listing of FY 1998 accomplishments is included in the tables in Section 3 of this document. A summary of each example follows:

- **In-Tank Precipitation Facility.** Based on concerns with the safety of operations at the In-Tank Precipitation (ITP) Facility at the Savannah River Site (SRS), the Board issued Recommendation 96-1 in August 1996. The Board had questioned process safety at this facility, which separates cesium and other radioactive isotopes from high-level waste liquids. The Board recommended that the DOE thoroughly evaluate benzene generation, retention, and release phenomena in ITP and develop adequate controls before conducting further large-scale ITP operations. The results of the chemistry program confirmed the Board's safety concerns with this process. Based on these results, the DOE notified the Board in January 1998 that work on ITP would be suspended, and that a program to evaluate alternative processes would be undertaken.
- **Enriched Uranium Operations.** The Board and its staff conducted numerous safety reviews at the Y-12 Plant, including efforts to upgrade the safety of Enriched Uranium Operations (EUO) and assessments of readiness to resume EUO operations to support a high-priority national security task. These actions by the Board facilitated the safe restart of uranium metallurgical operations in June 1998, the restart of residue processing

operations in December 1998, and the planning for future EUO activity restarts. Specifically, in various letters to DOE the Board identified:

- A lack of appropriate identification and implementation of safety controls for EUO, such as those for the ventilation system, dry vacuum system, emergency lighting, and the casting furnace water detection system. In response, DOE identified several new safety controls and resolved implementation deficiencies.
- Numerous differences between National Fire Protection Association (NFPA) codes and the way in which the Holden Gas Furnace is installed, tested, operated, and maintained. In response, Lockheed Martin Energy Systems performed a rigorous review of adherence to the NFPA codes and addressed the identified noncompliances through several equipment and operational modifications. The furnace is used to dry the wet residues and to burn small amounts of solids to recover highly enriched uranium.
- An overall breakdown in quality assurance for pressure boundary welds on a new anhydrous hydrogen fluoride delivery system being constructed to support future uranium metal production operations. Subsequently, DOE decided that field radiographic inspections of completed system welds would be performed to assure proper weld quality.
- Lack of operations management awareness and control of the maintenance of safety systems at the Y-12 Plant as evidenced by several recent occurrences. In response, DOE addressed the root causes and is taking actions to improve control of maintenance of safety systems.
- **Design and Construction for Stockpile Management.** DOE and the Los Alamos National Laboratory (LANL) have initiated significant steps intended to improve their project management of design and construction of stockpile management facilities. In a letter dated December 5, 1997, the Board highlighted the need for more effective project management of the Capability Maintenance and Improvement Project (CMIP) by both DOE and LANL to ensure that risks are identified early and effective controls are developed during the design stage. At that time, CMIP had as its objectives developing the capability to manufacture 50 pits per year and upgrading related facilities. Subsequently, CMIP began undergoing a redefinition, and the upgrades now being called CMIP are to be designed at some future time. However, the project management issues identified by the Board were common to other projects. Therefore, DOE and LANL in their responses are addressing all stockpile management construction projects involving nuclear facilities at LANL.

DOE has structured its organization to better oversee stockpile management projects at LANL and has outlined improvements in project management controls for interfacing with the LANL design process. The Director and Deputy Director of LANL committed to

significant improvements in construction project management and formed a new organizational structure to better manage design and construction projects. In part as a result of similar Congressional interest, the director of LANL tasked a Project Management Advisory Panel of outside experts to identify systemic performance issues and recommend improvements and corrective actions. These recommendations are currently being implemented. The full effectiveness of the changes is to be evaluated by the Board and its staff in 1999.

- **Suspect/Counterfeit Parts Issue.** In 1995, the Board's staff discovered substantial deterioration of DOE's program to prevent the introduction of suspect/counterfeit parts into safety-related applications. Board staff initiated several actions to correct the programmatic and operational deficiencies: Board staff alerted DOE's internal auditing elements (the Inspector General and safety oversight office) and the several program offices (Defense Programs; Environmental Management; Environment, Safety, and Health). Staff then undertook several initiatives to independently determine health and safety implications for defense nuclear facilities. For example, Board staff reviewed the Savannah River Site Defense Waste Processing Facility (DWPF) for the presence of suspect/counterfeit parts prior to the planned startup. The Board staff identified numerous applications of suspect/counterfeit fasteners in DWPF, and subsequently assisted DOE's technical evaluation of the suspect/counterfeit parts. This effort led to the replacement of fasteners found to be unacceptable for their safety-related applications in time not to delay the startup of DWPF. The Under Secretary of Energy then formed a Quality Assurance Working Group (QAWG) to restore DOE's quality assurance program and its ability to defend its missions from suspect/counterfeit and non-conforming parts.

In August 1996, Department of Defense investigators notified the DOE that a vendor of semiconductor devices for high-reliability applications supplied the DOE with potentially nonconforming parts. DOE applications of the nonconforming parts included significant national security applications and radioisotopic thermoelectric generators for the Cassini space probe. Notwithstanding repeated assurances from the DOE QAWG that a formal notification to DOE elements was imminent, the DOE did not notify field elements until the Board brought the problem to the attention of the Under Secretary of Energy.

The DOE subsequently took effective action to evaluate and control the future introduction of suspect/counterfeit parts into applications which could adversely affect worker and public safety and the safe maintenance of significant national security applications. The DOE identified nonconforming parts in significant national security applications, and then technically evaluated the adequacy of these parts and determined that the nonconforming parts would not compromise safety.

Additionally, the Cassini probe was inspected for the presence of the nonconforming parts, thus averting last minute legal efforts to halt the launch of the space probe. The U.S. District Court for Hawaii rejected motions to delay the launch of the Cassini probe because, among other reasons, the government was able to show that the Cassini probe

had been thoroughly inspected for the suspect semiconductor devices. Hawaii County Green Party v. Clinton, 980 F.Supp. 1160 (D.C. HAWAII, 1997)

The Board's staff continues to provide oversight and technical assistance to identify and assess the effects of possible introduction of suspect/counterfeit semiconductor devices in stockpile, stockpile support, and subcritical device testing and other safety related applications. As a result, the DOE QAWG is formalizing lessons learned and will report specific recommendations to update and strengthen the DOE Quality Assurance Program.

The Board's oversight and timely intervention in dealing with suspect/counterfeit parts, was pivotal in energizing the reestablishment of the DOE quality assurance program vital to ensuring public health and safety at DOE's defense nuclear facilities.

1.4 CONCLUSION

In establishing the Board, Congress and the President intended that the Board assure and enhance the safety of operations of DOE's defense nuclear facilities by providing independent, expert advice to the Secretary of Energy, identify the nature and consequences of any significant potential threats to public health and safety, elevate such issues to the highest levels of authority, and inform the public and help restore public confidence.

The positive impact of the Board's independent oversight on the DOE defense nuclear complex has become increasingly evident. During FY 1998, a number of DOE risk reduction actions and safety management upgrades resulting from Board initiatives, some initiated in previous years, were completed or advanced significantly. Representative examples of these accomplishments are discussed later in this budget request.

The five Board Members, together with a small but extremely competent workforce, provide a cost-effective organizational arrangement for achieving the added safety assurance that the public seeks. Our budget request of \$17.5 million, to be used for staff salaries and required overhead expenses such as travel to the DOE weapons sites, provides the funding needed to support the Board's health and safety review actions planned for FY 2000.

Finally, and perhaps of greatest significance, a federal commitment of \$17.5 million to support the Board's oversight operations in FY 2000 is a wise investment in the safety and security of our Nation, and pales in comparison to the potential economic and health costs of a nuclear accident in a defense nuclear facility.

2. MISSION & STRATEGIC PLANNING GOALS SUMMARY

2.1 THE DOE DEFENSE NUCLEAR COMPLEX TODAY

The DOE defense nuclear complex includes 34 individual sites containing about 3,500 nuclear facilities and covering approximately 2.1 million acres, with more than 85 million square feet of building space in 13 states. Numerous radioactive and toxic materials exist throughout the complex, and there are various pathways by which these hazardous materials might be released, thereby creating risks to workers, the public, and the environment. The integrity of facilities or structures which confine hazardous materials can be threatened by earthquakes, extreme winds, floods, lightning, and other such natural phenomena. Other potential release mechanisms include operator errors, equipment malfunctions, chemical reactions, fire, ignition of explosives, and inadvertent nuclear criticality events.

If hazardous materials and their potential release mechanisms are not carefully addressed, the consequences of a resulting accident at one of these defense nuclear facilities could include exposure to unacceptable radiation levels, uptake of radioactive materials, other serious compromise of the health and safety of the public and onsite workers, and unacceptable environmental impact. For example, recent incidents involving bulging waste storage containers, ruptured drums, and contamination of workers and facilities could be precursors of potentially more serious situations. The relative extent of these risks may be appreciated by considering the following:

- Hundreds of tons of fissionable material, in various forms, housed in buildings and structures that are more than 50 years old;
- Thousands of nuclear weapons being dismantled, evaluated, or modified;
- Hundreds of tons of plutonium, including components from dismantled nuclear weapons;
- The nation's strategic inventory of tritium gas, including thousands of individual containers removed from nuclear weapons;
- Thousands of tons of deteriorating nuclear fuel in water-filled storage basins;
- Millions of gallons of high level radioactive waste awaiting treatment, including highly radioactive isotopes in heavily shielded above-ground tanks, in addition to wastes stored underground at several sites.

2.2 GENERAL GOALS

With its broad health and safety oversight mission as defined by statute, the Board has developed seven general outcome goals that describe the intended result, effect, or consequence that will occur as a direct result of its oversight activities. These goals fall into two categories. The first category of the Board's goals (Goals 1–5) includes continuing safety goals that will not be completed in any single year, but are achieved every year as a result of the Board's actions (e.g., Goal 1—continuing assurance of the safety of DOE nuclear weapons operations). The second category of the Board's goals (Goals 6–7) focuses on achieving a specified safety outcome for a defined activity type (e.g., Goal 6—new defense nuclear facilities are designed and constructed to meet current safety standards) for which the Board in any given year may complete milestones associated with various DOE projects.

Using its action–forcing powers, the Board seeks to effect the following general outcome goals:

1. The safety of nuclear weapons at DOE defense nuclear facilities will continue to be assured.
2. Events or practices at hazardous DOE defense nuclear facilities that have adversely affected or may adversely affect public health and safety will be identified and, as needed, recommendations will be made to the Secretary of Energy identifying technically and economically feasible measures to address these hazards.
3. A flexible and adaptable DOE standards–based safety management program will be established that incorporates recognized good nuclear safety practices and allows for integration of work and safety planning for work that the Department and contractors perform at its hazardous defense nuclear facilities.
4. DOE technical expertise will be improved to permit the DOE to better manage the hazardous work associated with defense nuclear facilities.
5. Integrated Safety Management programs will be implemented for operations at defense nuclear facilities, with processes and controls tailored to the hazards involved.³

³ Integrated Safety Management (ISM) is the means by which the Department of Energy is institutionalizing the process of incorporating into the planning and execution of every major defense nuclear activity involving hazardous materials those controls necessary to ensure that environment, safety and health objectives are achieved. It consists of the infrastructure of component safety management programs and processes that, as an integrated whole, implements or ensures implementation of all institutional, facility, and activity level requirements, controls, and authorization basis commitments. Examples of “component safety management programs” include radiological control, maintenance, emergency response, fire protection, training, etc. Examples of “component safety management processes” include work planning, configuration management, criticality safety review, process hazard analysis, and self–assessment.

6. New defense nuclear facilities under design or construction will meet current safety standards.
7. Facilities used in the past for defense nuclear purposes will be safely cleaned up and deactivated in such a manner as to permit safe eventual disposition.

These outcome goals serve as the primary drivers for all oversight activities planned for FY 1999, FY 2000, and beyond. The Board focuses its actions on those activities and facilities that have reached a development stage that is best suited to constructive safety oversight, and on those operations where safety improvements have the greatest potential for risk reduction. The Board's independent oversight activities often reveal safety concerns that have not received attention by the DOE that is commensurate with the threat posed to the workers, the public, or the environment.

2.3 NATURE OF THE BOARD'S WORK

The Board's primary function is to assist the DOE in identifying health and safety problems at defense nuclear facilities so that they can be corrected, and then confirming that the resulting corrective actions are appropriately implemented. The Board stays closely attuned to the planning and execution of DOE's defense nuclear programs, gathering its information from a broad range of sources. These sources include, but are not limited to:

- On-site technical evaluations, reviews, and observations by the Board and its staff;
- Critical review of DOE safety analyses and proposed safety control schemes by competent technical experts;
- Public meetings at Board Headquarters and in the field; and
- Daily input from the Board's Site Representatives, as well as weekly summary reports that are placed on the public record.

The scheduling and conduct by the Board and its staff of its independent on-site technical evaluations, reviews, and observations frequently catalyze the DOE to begin identifying and correcting safety deficiencies. The Board has optimized its resources by assigning Site Representatives to high-priority defense nuclear sites, but extensive travel by Headquarters technical staff to defense nuclear facilities is still essential for the Board to accomplish its safety oversight mission.

So as to remain better informed on DOE's activities and initiatives, the Board also receives regular briefings by senior DOE officials. Information received by the Board in these briefings is used to understand how much progress is being made on safety matters and to gauge DOE's commitment to achieving real progress.

Based on the information gained, the Board chooses from the broad spectrum of action-forcing mechanisms granted to it by law to formally communicate identified concerns and promote appropriate DOE corrective action. These action-forcing mechanisms include Recommendations to the Secretary of Energy and to the President in the case of an imminent threat to public health and safety, requests for reports from the DOE, public meetings or hearings, technical exchanges and issuance of technical reports, investigations, and testimony to Congressional Committees. In addition, the Board often transmits issue reports prepared by the Board's staff to the DOE, thereby sharing the staff's observations and findings. The Board has found that calling DOE's attention to the important findings in these reports is often sufficient to lead to responsive corrective action by DOE's management. After a safety concern is identified, and formally communicated to the DOE, the Board and its staff confirm that appropriate corrective actions are developed and implemented by the DOE and its contractors in a timely manner.

Individual Board Members and the Board's staff may also engage in direct technical dialogue with the DOE and its contractors on specific safety concerns, and may participate in technical workshops and conferences where information relevant to safety improvement and risk reduction is exchanged. The Board has directed its senior staff members to meet frequently with their DOE counterparts to ensure that the staff is able to brief the Board on the status of safety issues and programs and on key safety questions, and that the DOE understands the Board's safety objectives and initiatives. This type of direct interaction conserves federal resources by ensuring that the DOE and the Board understand each other's positions in depth. This understanding, in turn, permits the Board to focus its Recommendations, letters, requests for information, and public meetings and hearings on the most important health and safety issues to be resolved. It averts the waste of resources of both the DOE and the Board on false starts and contention over easily resolved side-issues. In many cases, the simple exchange of ideas is sufficient to motivate the DOE to take appropriate actions without the Board's having to make formal Recommendations.

In addition to the wide scope of the Board's communications with DOE, the Board has exchanged information with other government agencies (e.g., Nuclear Regulatory Commission, the General Accounting Office, the Department of Defense, and the Environmental Protection Agency), as well as outside agencies (e.g., National Research Council and the National Academy for Public Administration). Such meetings serve to share knowledge, experiences, and factual information on matters of mutual interest with regards to the safety of the DOE defense nuclear facilities.

The Board remains committed to this policy of enhanced communication in the belief that in the end, safety is best served by spending federal dollars on real improvements at defense nuclear facilities, not on correspondence. Direct communication and discussions with the DOE in an open forum, such as public meetings, have proved to be powerful, cost-effective tools in advancing the Board's nuclear safety initiatives. The Board held eight public meetings with DOE in FY 1998, in both Headquarters and field locations, each of which involved substantive interchanges with senior DOE officials.

2.4 KEY EXTERNAL FACTORS AND PLANNING ASSUMPTIONS

The mission of the DOE defense nuclear complex has changed significantly from year to year since the Board's establishment, and will continue to evolve. The Board's safety oversight focuses on technical issues associated with mission-specific operations, which change with DOE's mission shifts. The Board also identifies and addresses fundamental and complex-wide safety management deficiencies, which are generally not impacted by DOE's changing mission.

During each annual performance reporting period, it is anticipated that DOE's mission and associated schedules for major actions will continue to change, and that the Board's independent evaluations will identify previously unknown safety concerns. As this occurs, the Board often will be required to redeploy resources within and among the primary areas of concentration addressed in the Board's Strategic Plan. The specified facility or activity on which a performance plan action focused may change; however, the same (or an increased) level of performance and output should be achieved, in support of the general outcome goals.

In addition to DOE mission/schedule changes and the emergence of new safety concerns, there are other external forces that have the potential to influence the Board's execution of its Strategic Plan and annual performance plans. In particular, if a major accident or other safety-significant event occurs at a DOE facility involving special nuclear material, the Board's oversight priorities will be changed significantly. This priority shift may require an expeditious reallocation of resources and a substantive revision to the Board's performance planning goals, and potentially may impact the Board's Strategic Plan objectives and action plans.

The Board's Strategic Plan was prepared with the acknowledgment of this potential for rapid change in the complex under its oversight purview. To focus the plan to the greatest extent possible, the Board highlighted certain planning assumptions that underlie its current prioritization of activities. These are as follows:

- U.S. national security policy continues to require nuclear weapons stockpile stewardship and management.
- The Administration maintains its moratorium on the underground testing of nuclear weapons. Resumption of underground testing would require a major shift in Board resources for oversight.
- The national priorities concerning the cleanup of contaminated DOE defense nuclear facilities, a key premise in the Board's Strategic Plan, remain unchanged.
- No major changes in the Board's current statutory authority or responsibilities in the DOE defense nuclear complex occur.

- **The startup date for the Waste Isolation Pilot Program (WIPP) does not slip. A significant delay in WIPP's opening will require a revised storage strategy for residues at Rocky Flats, impacting the Board's oversight plans.**

(The projected 1998 start-up date for WIPP was missed due to ongoing legal disputes. As of January 1999, a WIPP opening date remains uncertain pending resolution of the legal issues. The slippage caused Rocky Flats to implement a revised storage strategy for residues. The Board's oversight plans have been appropriately modified to accommodate the revised strategy.)

3. ANNUAL PERFORMANCE PLANS FOR FY 2000

The Board's statutory mission is logically divided into three strategic areas of concentration:

- **Complex-Wide Health and Safety Issues;**
- **Management and Stewardship of the Nation's Stockpile and Nuclear Weapons Components; and**
- **Hazardous Remnants of Weapons Production.**

In planning its work, the Board and its staff have applied a general set of strategic planning goals (see Section 2.2) to these focus areas. A set of seven strategic objectives and sixteen associated action plans that, in aggregate, implement the Board's general goals have been developed to address the three strategic areas of concentration. The relationship among these elements is discussed in the Board's Strategic Plan (available on the Board's Internet Home Page at www.dnfsb.gov).

As required by the Government Performance and Results Act, the Board and its staff further refined their planning efforts for the FY 1999 Budget Request to produce measurable performance goals that, when executed, would demonstrate progress towards the Board's strategic objectives in each focus area, and consequently toward its general goals. As was anticipated, operational experience in using the objectives, actions, and projected goals and measures throughout FY 1998 revealed areas of potential improvement in performance planning and measurement for FY 1999 and FY 2000. The resulting necessary modifications to the FY 1999 performance plan are discussed in the introductory material for each of the three strategic areas of concentration; some terminology was changed in all sections of the performance plan to more accurately reflect the action-forcing nature of the Board's work. It should be noted that the FY 2000 performance goals have been prepared to clearly communicate how the Board's planned efforts will support DOE's FY 2000 strategic objective of full implementation of integrated safety management systems throughout the DOE complex; as a result, more explanatory material is included in some of the FY 2000 performance goals than was seen in the goals for FY 1999. It is anticipated that the Board's Strategic Plan objectives and action plans may also evolve slightly prior to submission of the Board's FY 2000 Budget Request to Congress.

The Board has created a set of performance goals and measures for FY 2000 that establish projected levels of performance and reflect the nature of the Board's independent oversight function. As discussed in Sections 2.3 and 2.4, the focus of the Board's efforts can vary significantly from year to year largely because of external factors. To address this uncertainty (that is beyond its span of control), the Board has created performance goals focused on activity-level areas of concern that support its strategic objectives (e.g., safe dismantlement of

nuclear weapons, stabilization of nuclear wastes, etc.), coupled with a combination of output and expected outcome measures. Often, the expected outcome measure will be evidenced by appropriate safety management action by the DOE, taken in response to a formal or direct Board or staff action. Past reporting experience, developed over the last eight years of reporting progress to Congress in the Board's Annual Reports, has shown that it should be possible to conduct a retrospective assessment of Board-identified issues and associated DOE responses to demonstrate that the Board has had a clear and positive impact on the safety culture within the DOE.

To facilitate an integrated review, the sections below are formatted to show the flow-through from strategic objectives to annual performance goals for FY 1999 and FY 2000, as well as the associated performance measures for FY 2000. To place this planning information in context, the tables also provide examples of the Board's related FY 1998 accomplishments.

The use of consensus and DOE-specific standards is fundamental to the Board's approach to safety assessment and oversight. Board Recommendations, DOE's associated Implementation Plans and other commitments, and the Board's Technical Reports are also used to focus reviews. The standards and criteria used to support the Board and staff evaluations include:

10 CFR 835	<i>Occupational Radiation Protection</i>
29 CFR 1910	<i>Process Safety Management of Highly Hazardous Chemicals</i>
48 CFR 970.2303-2(a)	<i>Integration of Environment, Safety, and Health Into Work Planning and Execution</i>
DOE P 414.1	<i>Management Functions, Responsibilities, and Authorities Policy</i>
DOE P 450.1	<i>Environment, Safety, and Health Policy for the Department of Energy Complex</i>
DOE P 450.4	<i>Safety Management System Policy</i>
DOE P 450.5	<i>Line Environment, Safety and Health Oversight</i>
DOE O 210.1	<i>Performance Indicators and Analysis of Operations Information</i>
DOE O 231.1	<i>Environment, Safety and Health Reporting</i>
DOE O 232.1	<i>Occurrence Reporting and Processing of Operations Information</i>
DOE O 251.1A	<i>Directives System</i>
DOE O 252.1A	<i>Technical Standards Program (presently in draft)</i>
DOE O 360.1	<i>Training</i>
DOE O 420.1	<i>Facility Safety</i>
DOE O 425.1	<i>Startup and Restart of Nuclear Facilities and applicable Guides</i>

DOE O 430.1	<i>Life Cycle Asset Management (430.1A presently in draft), and applicable Good Practice Guides</i>
DOE O 452.1A	<i>Nuclear Explosive and Weapon Surety Program</i>
DOE O 452.2A	<i>Safety of Nuclear Explosive Operations, and applicable Guides</i>
DOE O 460.1A	<i>Packaging and Transportation Safety, and applicable Guides</i>
DOE O 5480.19	<i>Conduct of Operations Requirements for DOE Facilities</i>
DOE O 5480.20A	<i>Personnel Selection, Qualification and Training Requirements for DOE Nuclear Facilities</i>
DOE O 5480.21	<i>Unreviewed Safety Questions</i>
DOE O 5480.22	<i>Technical Safety Requirements</i>
DOE O 5480.23	<i>Nuclear Safety Analysis Reports, and applicable Guides</i>
DOE O 5480.24	<i>Nuclear Criticality Safety, and applicable Guides</i>
DOE O 5820.2A	<i>Radioactive Waste Management</i>
DOE O 6430.1A	<i>General Design Criteria</i>
DOE M 411.1-1	<i>Manual of Safety Management Functions, Responsibilities, and Authorities</i>
DOE M 450.3-1	<i>DOE Closure Process for Necessary and Sufficient Sets of Standards</i>
DOE G 421.1	<i>Criticality Safety Good Practices Guide for DOE Nonreactor Nuclear Facilities</i>
DOE G 450.4-1	<i>Integrated Safety Management System Guide</i>
DOE STD 1073-93	<i>Guide for Operational Configuration Management Programs</i>
DOE STD 3013-96	<i>Criteria for Preparing and Packaging Plutonium Metals and Oxides for Long-Term Storage</i>
DOE STD 1120-98	<i>Integration of Environmental, Safety and Health into Facility Disposition Activities</i>
DOE-AL Supplemental Directive 56XC	<i>Nuclear Weapons Stockpile Evaluation Program</i>
DOE-AL Engineering Procedure EP401080	<i>New Material and Stockpile Systems Evaluation</i>
Recommendation 93-1	<i>Standards Utilization in Defense Nuclear Facilities, and DOE's associated Implementation Plan</i>

Recommendation 93-3	<i>DOE Technical Capability in Defense Nuclear Facilities Programs, and DOE's associated Implementation Plan</i>
Recommendation 93-5	<i>Hanford Waste Tanks Characterization Studies, and DOE's associated Implementation Plan</i>
Recommendation 93-6	<i>Maintaining Access to Nuclear Weapons Expertise in the Defense Nuclear Facilities Complex, and DOE's associated Implementation Plan</i>
Recommendation 94-1	<i>Improved Schedule for Remediation in Defense Nuclear Facilities Complex, and DOE's associated Implementation Plan</i>
Recommendation 94-3	<i>Rocky Flats Plutonium Storage, and DOE's associated Implementation Plan</i>
Recommendation 94-4	<i>Y-12 Plant Conduct of Operations, and DOE's associated Implementation Plan</i>
Recommendation 95-1	<i>Uranium Enrichment, and DOE's associated Implementation Plan</i>
Recommendation 95-2	<i>Safety Management, and DOE's associated Implementation Plan</i>
Recommendation 96-1	<i>In-Tank Precipitation System at the Savannah River Site, and DOE's associated Implementation Plan</i>
Recommendation 97-1	<i>Uranium-233 Storage Safety at Department of Energy Facilities, and DOE's associated Implementation Plan</i>
Recommendation 97-2	<i>Criticality Safety, and DOE's associated Implementation Plan</i>
DNFSB/TECH-1	<i>Plutonium Storage Safety at Major Department of Energy Facilities</i>
DNFSB/TECH-3	<i>Overview of Ventilation Systems at Selected DOE Plutonium Processing and Handling Facilities</i>
DNFSB/TECH-5	<i>Fundamentals for Understanding Standards-Based Safety Management of DOE Defense Nuclear Facilities</i>
DNFSB/TECH-6	<i>Safety Management and Conduct of Operations at the Department of Energy's Defense Nuclear Facilities</i>
DNFSB/TECH-10	<i>An Assessment Concerning Safety at Defense Nuclear Facilities — the DOE Technical Personnel Problem</i>
DNFSB/TECH-12	<i>Regulation and Oversight of Decommissioning Activities at Department of Energy Defense Nuclear Facilities</i>
DNFSB/TECH-13	<i>U-233 Storage Safety at Department of Energy Facilities</i>
DNFSB/TECH-14	<i>Savannah River Site In-Tank Precipitation Facility Benzene Generation—Safety Implications</i>

DNFSB/TECH-15	<i>Operational Formality for Department of Energy Defense Nuclear Facilities and Activities — An Evaluation Guide</i>
DNFSB/TECH-16	<i>Integrated Safety Management</i>
DNFSB/TECH-17	<i>Review of the Hanford Spent Nuclear Fuel Project</i>
DNFSB/TECH-18	<i>Review of the Safety of Storing Plutonium Pits at the Pantex Plant</i>
DNFSB/TECH-19	<i>Authorization Agreements for Defense Nuclear Facilities and Activities</i>

3.1 COMPLEX-WIDE HEALTH AND SAFETY ISSUES

3.1.1 Overview

In executing its various missions, the DOE faces a number of difficult complex-wide health and safety issues, including the continuing complex-wide reduction in its workforce; its ongoing program to revise or reduce contractor requirements specified in orders, rules, and standards; loss of contractor critical skills and facility knowledge; increasingly tight budgetary constraints; and the variety of activities and contracting approaches at the various sites. To resolve these issues will require a more disciplined approach for ensuring the safety of operations at DOE's defense nuclear facilities. Therefore, the Board has recommended that the DOE:

- identify the roles and responsibilities of DOE and its contractors' personnel related to health and safety;
- define the technical competencies and experience required to satisfy these responsibilities; and
- plan, execute, and control work activities in a disciplined, systematic manner that defines work scope, analyzes applicable hazards, develops and implements necessary controls, and provides feedback and improvement to work processes and products.

The Board's Strategic Plan identifies two specific objectives that it intends to pursue to ensure that DOE performs its defense nuclear mission safely. They are:

- I-A. Verify that Integrated Safety Management (ISM) programs at DOE facilities are tailored to existing hazards, developed to prescribed standards, and implemented by managers and workers.⁴

⁴ Integrated Safety Management (ISM) is the means by which the Department of Energy is institutionalizing the process of incorporating into the planning and execution of every major defense nuclear activity involving hazardous materials those controls necessary to ensure that environment, safety and health objectives are achieved. It consists of the infrastructure of component safety management programs and processes that, as an integrated whole, implements or

- I-B. Confirm that roles, responsibilities, experience, and competencies required to protect workers and the public are explicitly defined and implemented for both DOE and its contractors' personnel.

The Board believes that specific actions currently planned for FY 1999 and FY 2000 to advance each of these objectives are possible and desirable. These actions, which are specified in the following tables, build on the Board's activities and accomplishments of past years in technically rigorous oversight and constructive interaction with the DOE. Examples of related FY 1998 performance accomplishments that have supported the Board's objectives are also provided in the following tables. All such activities and accomplishments have been publicly identified in documents such as the Board's Annual Reports, letters, technical reports, and previous budget requests. The Board's action plans described in the following tables are also based on its assessment of progress expected in FY 1999 and on major DOE efforts planned during FY 2000, which in turn are predicated on many factors—most importantly, the DOE budget and its accomplishments during this period.

3.1.2 Adjustments to the FY 1999 Performance Goals

The primary external factors that drive modifications to the performance goals of this strategic area of concentration are of three types:

- Changes in functional area focus for DOE's directives upgrade program;
- Delays in the schedules for design and construction projects; and
- Slower progress than committed to by the DOE in the implementation of integrated safety management systems.

For FY 1999, a performance goal that requires substantive modification is the one focused on design and construction projects (Objective/Action I-A.3). While the same level of performance is still anticipated in FY 1999 (two reviews), the candidate facilities have changed to some extent, based on the latest DOE schedule projections for facility design and construction projects. The FY 1999 performance goals associated with Objective/Action I-A.4 and I-B.1 have been expanded and made more specific, based on progress and accomplishments in these two areas during FY 1998. Minor editorial changes were made to clarify the intent or context of the performance goals associated with Objective/Actions I-A/1, I-A.2, and I-B.2.

ensures implementation of all institutional, facility, and activity level requirements, controls, and authorization basis commitments. Examples of "component safety management programs" include radiological control, maintenance, emergency response, fire protection, training, etc. Examples of "component safety management processes" include work planning, configuration management, criticality safety review, process hazard analysis, and self-assessment.

3.1.3 COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Objective –	I–A. Verify that Integrated Safety Management (ISM) programs at DOE facilities are tailored to existing hazards, developed to prescribed standards, and implemented by managers and workers.
Action Plan –	1. Determine the technical adequacy of new or revised health and safety related orders, rules, and standards for use in developing ISM programs for defense nuclear facilities and, by technical interchange, public meetings, or other Board actions, lead DOE to issue new or revised standards, where necessary, that have adequate requirements for the protection of the health and safety of the workers and the public. (Goal 3)

Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>In direct response to Board and staff action, DOE revised DOE Order 251.1A, <i>Directives System</i>, and DOE Manual 251.1–1A, <i>Directives System Manual</i>. These documents incorporate key provisions that ensure:</p> <ul style="list-style-type: none">• The Board has the opportunity to review applicable health and safety directives before issuance,• DOE documents/tracks the preservation of health, and safety requirements when directives are revised, and• Health and safety directives do not automatically expire after a fixed duration. <p>The Board’s reviews of the application of DOE Manual 450.3–1, <i>DOE Closure Process for Necessary and Sufficient Sets of Standards</i>, at selected DOE facilities identified that an incomplete set of proposed contractual requirements for health and safety resulted, due in part to a lack of adequate requirements and guidance in the directive. Board public meetings and formal correspondence caused DOE to commit to revise this directive to incorporate lessons learned in a coordinated manner with the scheduled revision of DOE Guide 450.4–1, <i>Integrated Safety Management System Guide</i>.</p> <p>Formal Board correspondence and direct attention by individual Board Members, as well as staff reviews of numerous draft DOE health and safety directives and direct interactions with DOE, caused DOE to integrate one set of health and safety directives, under a revision to DOE Order 430.1, <i>Life Cycle Asset Management</i>, which provides for an adequate level of protection of the worker, public, and the environment. This integrated directives set is expected to be issued shortly.</p>	<p>a. Board and staff efforts (including interaction with the DOE offices involved with developing, maintaining and implementing the directives system, and through formal Board action) lead DOE towards consolidating and integrating its set of health and safety directives.</p> <p>b. Through Board and staff reviews and actions, encourage DOE to appropriately update the health and safety directives explicitly associated with ISM, including:</p> <ul style="list-style-type: none">• G450.4–1, <i>Integrated Safety Management System Guide</i>, and• G414.1–1, <i>Implementation Guide for Use with Independent and Management Assessment</i>, <p>based on experience and lessons learned in implementing ISM throughout the DOE complex in FY 1998.</p>	<p>a. The Board and its staff review and assess proposed new DOE health and safety directives and safety–significant modifications to existing directives.</p> <p>In FY 2000, the Board will place particular emphasis on encouraging DOE to improve the consolidation and integration of its health and safety directives in the following areas:</p> <ul style="list-style-type: none">• feedback and improvement, and• requirements selection, <p>including those health and safety directives explicitly associated with ISM, for example:</p> <ul style="list-style-type: none">• P251.1, <i>Directives System</i>;• P450.4, <i>Safety Management System Policy</i>;• P450.5, <i>Line Environment, Safety, and Health Oversight Policy</i>;• P450.3, <i>Authorizing Use of the Necessary and Sufficient Process for Standards-Based Environment, Safety and Health Management</i>;• M450.3–1, <i>The Department of Energy Closure Process for Necessary and Sufficient Sets of Standards</i>.	<p>a. <u>Output</u>: New or significantly modified health and safety directives are reviewed and results are communicated to DOE by the Board or its staff for incorporation or resolution, as appropriate.</p> <p><u>Expected Outcome</u>: When DOE issues new or modified health and safety directives, they are in an enhanced form, resulting in improved safety through standardized requirements and guidance that provide for adequate protection of the workers, public, and the environment.</p>

3.1.3 COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Objective – I–A. Verify that Integrated Safety Management (ISM) programs at DOE facilities are tailored to existing hazards, developed to prescribed standards, and implemented by managers and workers.

Action Plan – 2. Review ISM program development and evaluate technical progress at DOE sites. (Goal 5)

Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>The Board's December 1997 reporting requirement caused DOE and its site contractors to evaluate the status of ISM at facilities beyond those that were designated as top priority in response to the Board's Recommendation 95–2. In addition, many sites reported that this systematic evaluation revealed areas of needed improvement and integration in their ISM programs.</p> <p>The Board and its staff closely tracked DOE's development and implementation of an ISM verification approach. In March 1998, the Board issued a letter highlighting lessons learned from verification reviews and identifying areas of needed improvement, including team composition and expertise, contractor involvement, and follow-up and closure of findings.</p>	<p>a. The Board and DOE mutually agree that the essential elements of facility-level ISM are implemented for the twelve individual defense nuclear facilities that were identified as top priority in DOE's Implementation Plan for Board Recommendation 95–2.</p> <p>b. Through Board and staff reviews and actions, encourage DOE to have institutional-level ISM System "descriptions," as required by the DOE Acquisition Regulations, in place for all sites with operational defense nuclear facilities.</p> <p>c. The Board and DOE mutually agree to a schedule by which institutional-level ISM Systems will be implemented for all operational facilities at defense nuclear sites.</p>	<p>a. The Board and its staff observe and assess DOE's verification reviews of institutional-level ISM System implementation for those sites with facilities that were identified as top priority in DOE's Implementation Plan for Board Recommendation 95–2, as well as one of DOE's verification reviews conducted for a defense nuclear site identified as the next level of priority (e.g., Sandia National Laboratories, the Nevada Test Site, or Idaho National Engineering and Environmental Laboratory).</p> <p>b. The Board and its staff review and assess Authorization Agreements for Pantex Plant nuclear weapons activities (an ongoing area of top priority under DOE's Implementation Plan for Board Recommendation 95–2), as well as selected Authorization Agreements for other defense nuclear facilities and activities.</p> <p>c. DOE has a strategic objective to implement ISM complex-wide in FY 2000. To support this DOE safety management objective, the Board improves its communication effectiveness by consistently characterizing technical review results using the standard ISM terminology first developed in DOE's Implementation Plan for Board Recommendation 95–2, and formally promulgated in G450.4–1, <i>Integrated Safety Management System Guide</i>.</p>	<p>a. <u>Output</u>: Institutional-level ISM System verification reviews for sites with top priority facilities are assessed, plus one additional verification review. Assessment results are communicated to DOE by the Board or its staff.</p> <p>b. <u>Output</u>: Proposed Authorization Agreements for Pantex Plant nuclear weapons operations and for selected defense nuclear facilities and activities are assessed. Assessment results are communicated to DOE by the Board or its staff.</p> <p>c. <u>Output</u>: Results that are communicated to DOE by the Board or its staff are appropriately tied to ISM concepts.</p> <p><u>Expected Outcome</u>: DOE verification reviews and authorization agreements are effective tools for inculcating ISM concepts, and technical advisories from the Board are easily related to applicable ISM core functions and principles.</p>

3.1.3 COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Objective –	I–A. Verify that Integrated Safety Management (ISM) programs at DOE facilities are tailored to existing hazards, developed to prescribed standards, and implemented by managers and workers.
Action Plan –	3. Perform design reviews of DOE's design/construction projects to determine appropriate application of proven principles of systems engineering, standard analytical methodology, and disciplined construction management that ensure safe start-up and operation of defense nuclear facilities. (Goal 6)

Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>Review of the Capability Maintenance and Improvement Project at the Los Alamos National Laboratory by the Board and its staff identified several issues with the technical management, design process and design documents for the project that did not fully consider health and safety requirements. These issues were identified in a December 1997 Board reporting requirement for DOE and were further clarified in several meetings between DOE and the Board and its staff. This caused DOE to initiate major improvements to its project organizations, design/construction process, and design criteria development.</p> <p>The Board's reviews identified that the original geotechnical field investigation for the Actinide Packaging and Storage Facility at the Savannah River Site had insufficient coverage for the final siting. In January 1998, the Board successfully encouraged the Savannah River Site to expand the scope of the geotechnical investigation, which is important for confirming design inputs and resolving other safety design concerns. Board and staff interaction with Savannah River Site personnel has also led to on-site contractor technical expertise being more involved in this design, and this has resulted in earlier identification and resolution of design issues.</p> <p>The Board's reviews identified shortcomings in the Hanford Spent Nuclear Fuel Project that included the lack of sound project management, a potential battery room hydrogen explosion hazard, and an inability to address emerging technical issues in a timely manner, thereby unduly delaying the safe, expeditious removal and stabilization of deteriorating fuel. In November 1997, and February and March 1998, the Board issued reports that identified these issues and the need for increased attention (both internal and external to DOE) on the Project's shortcomings. Continued Board and staff pressure through correspondence, meetings, including public meetings, has led DOE to streamline Project organization, to adequately address the potential explosion risk, and, closure on issues associated with the design and fabrication of the Multi-Canister Overpack (the container for storing spent nuclear fuel).</p>	<p>a. The Board and its staff complete two reviews of DOE design/construction activities, including:</p> <ul style="list-style-type: none"> • technical project management, • criteria development, • design preparation, and • construction, <p>and urge DOE to take appropriate actions in response to any significant findings from these reviews, with the intended result of embedding adequate safety measures within the designs.</p> <p>Candidate facilities for review include:</p> <ul style="list-style-type: none"> • Hanford – new spent nuclear fuel facilities and the Tank Waste Remediation System, • Los Alamos National Laboratory – the TA-55 pit production project, • Savannah River Site – tritium facilities, plutonium storage, and plutonium disposition facilities. 	<p>a. The Board and its staff perform two appropriately tailored reviews of DOE design/construction activities, including</p> <ul style="list-style-type: none"> • technical project management, • criteria development, • design preparation, and • construction, <p>and communicate any identified issues that will require resolution to provide for adequate protection of the worker, the public, and the environment.</p> <p>Selection for review is based on relative hazards, and on DOE's schedule and progress on the candidate facilities.</p> <p>b. The Board and its staff encourage DOE to evaluate and incorporate lessons learned during major design, construction, and deactivation efforts into the directives concerning project management and systems engineering throughout the full life cycle, including:</p> <ul style="list-style-type: none"> • O430.1, <i>Life Cycle Asset Management</i>, and • applicable Good Practices Guides, <p>with the intent of greater emphasis being placed on improving and standardizing DOE's approach to systems engineering and project management.</p>	<p>a. <u>Output</u>: Two tailored design/construction reviews are conducted and results are communicated to DOE by the Board or its staff.</p> <p>b. <u>Output</u>: New or modified directives for project management and systems engineering are reviewed and results are communicated to DOE by the Board or its staff.</p> <p><u>Expected Outcome</u>: An adequate approach and schedule for resolution of identified issues is developed to support safe start-up and operation of new or modified defense nuclear facilities.</p>

3.1.3 COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Objective –	I–A. Verify that Integrated Safety Management (ISM) programs at DOE facilities are tailored to existing hazards, developed to prescribed standards, and implemented by managers and workers.
Action Plan –	4. Evaluate the effectiveness of individual components, as well as the integration of all components, that make up DOE’s feedback and improvement safety management function for defense nuclear activities. (Goal 2 and Goal 5)

Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
In March 1998, the Board issued a reporting requirement concerning DOE and contractor line management and independent responsibilities and programs for feedback and improvement. DOE’s response committed to a plan of action and, in addition, during a June public meeting on DOE’s status implementing Recommendation 95–2, the Department committed to evaluate the need to consolidate and improve the DOE requirements for environment, safety, and health reporting.	<p>a. Through Board and staff reviews and actions, encourage DOE to improve integration of DOE’s environment, safety, and health reporting requirements. Areas of specific focus will include:</p> <ul style="list-style-type: none">• the adequacy of the contractually–required performance measures for one national laboratory (as compared to similar requirements at other defense nuclear facilities), and• the utility and integration of various Order–mandated environment, safety, and health performance reports. <p>b. Through Board and staff reviews and actions, drive DOE to develop an adequate plan to consolidate and make necessary changes to the DOE/Contractor system for disseminating results of internal DOE assessments, oversight activities, and lessons learned.</p> <p>c. Through Board and staff reviews and actions, encourage DOE to more clearly define the current assignments of responsibilities for the feedback and improvement function.</p>	<p>a. The Board and its staff assess DOE’s development and issuance of guidance for establishing effective ISM performance measures.</p> <p>b. The Board and its staff assess DOE’s development and issuance of guidance to adequately consolidate and make necessary changes to the DOE/Contractor system for disseminating results of internal DOE assessments, oversight activities, and lessons learned, and for the implementation of value–added corrective actions resulting from these activities.</p>	<p>a. <u>Output</u>: New or modified DOE directives governing effective ISM performance measurement are reviewed and results are communicated to DOE by the Board or its staff.</p> <p>b. <u>Output</u>: New, modified, or consolidated directives governing assessments, oversight, lessons learned, and effective corrective action programs are reviewed and results are communicated to DOE by the Board or its staff.</p> <p><u>Expected Outcome</u>: DOE–issued directives on feedback and improvement appropriately address Board and staff review results, yielding improved guidance for this core ISM functional area.</p>

3.1.3 COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Objective –	I–B. Confirm that roles, responsibilities, experience, and competencies required to protect workers and the public are explicitly defined and implemented for both DOE and its contractor personnel.
Action Plan –	1. Conduct specific reviews of DOE organizational documents (e.g., Manual of Functions, Responsibilities and Authorities) and operations at DOE Headquarters and in the field, and communicate results to DOE via technical exchanges, public meetings, or formal Board action. (Goals 4 & 5)

Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>The structure of DOE's program for responding to the Board's Recommendation 94–1 was not being managed adequately, in part because there was no organization in DOE with the required cross-cutting authority and resources to provide adequate direction for the integration of complex-wide nuclear material stabilization activities. In December 1997, the Board issued a letter encouraging DOE to restructure the leadership of this very important risk-reduction program. In its response, DOE assigned the Deputy Secretary as the responsible manager for resolving complex-wide integration issues.</p> <p>The Board's reviews revealed that the roles, responsibilities, and interfaces between DOE and its contractor in implementing the Capability Maintenance and Improvement Project at the Los Alamos National Laboratory were not clearly defined; there was no assurance that requirements important to health and safety were identified and appropriately developed through every phase of a design/construction project. In December 1997, the Board requested a report from DOE to address these issues. In responding to this reporting requirement, DOE and Los Alamos management have initiated key organizational changes and have committed to resolving the issues identified by the Board.</p>	<p>a. Conduct Board and staff reviews to examine DOE's implementation of the safety functions and responsibilities contained in the DOE corporate level, program office, and Field element Functions, Responsibilities, and Authorities Manuals (FRAMs). The intent of these reviews is to steer DOE towards more effective implementation of this fundamental ISM principle.</p> <p>A priority candidate for specific Board and staff review is the safety management of nuclear explosive operations.</p>	<p>a. The Board and its staff review and assess the roles and responsibilities assignments for safety management for:</p> <ul style="list-style-type: none">• one DOE Headquarters organization, and• two DOE Field organizations (one under the DOE Office of Defense Programs and one under the Office of Environmental Management), <p>including appropriate consideration of the associated FRAMs. The intent of these reviews is to determine whether DOE's system of FRAMs accurately reflects the assignment of safety management responsibilities in Headquarters and the Field, and to identify any areas that require additional DOE action.</p>	<p>a. <u>Output</u>: Three reviews are conducted and the results are communicated to DOE by the Board or its staff.</p> <p><u>Expected Outcome</u>: There is enhanced understanding of safety-related roles and responsibilities in support of DOE's execution of functions associated with protecting the worker, public, and environment.</p>

3.1.3 COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Objective –	1–B. Confirm that roles, responsibilities, experience, and competencies required to protect workers and the public are explicitly defined and implemented for both DOE and its contractor personnel.
Action Plan –	2. Monitor closely DOE efforts to recruit and retain a safety management staff of exceptional quality, education, and experience. Review the results of DOE's reduction-in-force actions arising from DOE budget reductions to-date, including ongoing evaluation of the DOE implementation of related Board Recommendations. (Goals 2, 4 & 5)

Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>Stabilization and clean-up of hazardous materials at Hanford continues to demand personnel with critical technical expertise. As part of the continuing efforts on Board Recommendation 93-3, the DOE-Richland Operations Office has been encouraged by the Board to acquire additional technical expertise in critical areas (e.g., project management and nuclear safety). DOE-Richland requested authority from DOE-Headquarters to hire 25 additional technical staff, including excepted service billets. With the Board's support, this authorization was granted and the hiring is now in progress.</p> <p>Concerns with maintaining an adequate level of assurance of the health and safety of workers and the public led the Board to issue Recommendation 97-2, <i>Criticality Safety</i>, which, in part, called for institutionalizing various initiatives to provide for the continued technical competence of criticality safety professionals in the DOE nuclear weapons complex. Through continued interaction between the Board, its staff, and DOE, significant progress has been made in examining and prioritizing DOE's criticality experimental research program and in capturing historical criticality experimental data through archiving interviews of retired criticality safety experts.</p>	<p>a. Through Board staff reviews and Board actions at three sites with new or newly resumed operations (e.g., Oak Ridge Y-12, Savannah River Site tritium facilities, Nevada Test Site, or the Pantex) Plant, encourage DOE to complete rigorous self-assessments of implementation of the Technical Qualification Program for DOE employees, and to determine whether the skills and competencies necessary to conduct nuclear and nuclear explosive activities safely are adequate and continue to improve.</p> <p>b. Confirm, through Board and staff reviews and action, that progress is being made to implement the commitments contained in the associated DOE Implementation Plans for:</p> <ul style="list-style-type: none"> • Board Recommendation 97-2, <i>Criticality Safety</i>, and • Board Recommendation 93-3, <i>Improving DOE Technical Capability in Defense Nuclear Facilities Programs</i>. 	<p>a. The Board and its staff collaborate with DOE in its efforts to address the remaining commitments under the Recommendation 93-3 Implementation Plan, which include DOE's commitment to complete its periodic assessments of the effectiveness of the Federal Technical Capabilities Program for DOE employees.</p> <p>b. As part of scheduled DOE and contractor operational readiness determinations involving the following organizations:</p> <ul style="list-style-type: none"> • DOE-Livermore Site Office, • DOE-Richland Operations Office, • DOE-Albuquerque Operations Office, • Los Alamos National Laboratory, • Lawrence Livermore National Laboratory, and • Oak Ridge Y-12, <p>the Board and its staff assess whether competence is commensurate with assigned responsibilities for key safety management personnel. Two DOE Field Offices and two defense nuclear contractor organizations will be assessed.</p> <p>c. The Board collaborate with DOE in its efforts to address the remaining commitment under the Recommendation 97-2 Implementation Plan, which supports the assurance that Federal staff directly performing criticality safety oversight are qualified.</p>	<p>a. <u>Output:</u> An assessment of the Federal Technical Capabilities Program is completed and results communicated to DOE by the Board or its staff.</p> <p>b. <u>Output:</u> Four reviews are conducted (2 DOE and 2 contractor) and results communicated to DOE by the Board or its staff.</p> <p>c. <u>Output:</u> A technically adequate DOE program is in place for the qualification of DOE's employees on contractor criticality safety practices.</p> <p><u>Expected Outcome:</u> Rigorous assessments of the technical capabilities of its personnel provide DOE with information vital to assuring the safety of defense nuclear facilities; this information is be used by DOE to continuously upgrade the quality of its technical workforce.</p>

3.2 MANAGEMENT AND STEWARDSHIP OF THE NATION'S STOCKPILE AND NUCLEAR WEAPONS COMPONENTS

3.2.1 Overview

Nuclear weapons continue to play an integral role in U.S. national security policy. By their nature, the operations to maintain a nuclear weapons stockpile involve hazards that, if not adequately controlled, could pose unacceptable consequences to the public and the workers. Therefore, the DOE must ensure that the unique hazards associated with nuclear weapons and components are adequately controlled in a tailored, integrated safety management system. The Board maintains safety oversight of the DOE as it conducts its nuclear weapons operations in fulfillment of national security objectives and continues to protect the health and safety of the workers and the public.

The Board's Strategic Plan identifies three specific objectives to improve the safety of operations involving DOE's nuclear weapons and nuclear weapon components:

- II-A. Cause the DOE to improve the collection, analysis, and dissemination of information related to safety as part of its weapons stockpile stewardship and management program.
- II-B. Confirm that the maintenance and modification of the nuclear weapons stockpile and associated research and development are performed safely using an integrated safety management approach that adequately controls the hazards associated with these activities.
- II-C. Verify that the permanent dismantlement of retired nuclear weapons and the disposition of components are completed safely in a manner appropriate to the hazards of these operations.

The Board believes that specific actions currently planned for FY 1999 and FY 2000 to advance each of these objectives are achievable and desirable. These actions, which are specified in the following tables, build on the Board's activities and accomplishments of past years in technically rigorous oversight and constructive interaction with the DOE. Examples of the related FY 1998 performance accomplishments that have supported these objectives are also provided in the following tables. All such activities and accomplishments have been publicly identified in documents such as the Board's Annual Reports, letters, technical reports, and previous budget requests. The Board's action plans described in the following tables are also based on its assessment of progress expected in FY 1999 and major DOE efforts planned during FY 2000, which in turn are predicated on many factors—most importantly, DOE's budget and its accomplishments during this period.

3.2.2 Adjustments to the FY 1999 Performance Goals

The changes in this strategic area of concentration in the FY 1999 Performance Plan generally represent efforts to improve the focus of the performance goals, as well as to account for the Board's and DOE's achievements in 1998. The substantive changes in this section are:

Objective/Action II-A.1: Two performance goals were combined to create a single comprehensive effort to assess several programs underway to gain additional information from several sources (e.g., Core Surveillance Program, the Enhanced Surveillance Program, and the knowledge preservation program) to improve the quality of safety-related weapon system information in Weapon Safety Specifications and Hazard Analysis Reports.

Objective/Action II-B.1: One performance goal previously in this section was combined into the performance goals under Complex-Wide Health and Safety Issues so as to provide a single area of strategic focus related to the development of Integrated Safety Management Systems.

Objective/Action II-C.1: The focus of two performance goals was modified slightly to a review of the entire system of standards, directives, implementing instructions, and controls refined over the last year to ensure the safe dismantlement of retired nuclear explosives. The goals had previously focused only on the principal DOE Orders and standards in that system.

The focus of a third performance goal was changed to address the safety of dismantling nuclear weapon secondaries at Oak Ridge Y-12 to be more consistent with the strategic plan objective. The safety of other activities at Oak Ridge Y-12 is already adequately addressed under Objectives II-A and II-B.

3.2.3 MANAGEMENT AND STEWARDSHIP OF THE NATION'S STOCKPILE AND NUCLEAR WEAPONS COMPONENTS

Objective –	II–A. Cause DOE to improve the collection, analysis, and availability of information related to safety, as part of its weapons stockpile stewardship and management program.
Action Plan –	1. Monitor DOE/Contractor actions and advise DOE to ensure that the weapons complex develops and maintains an adequate understanding of, and resolves health and safety issues associated with operations involving production, assembly, testing, storage, and disassembly of weapons and components. (Goals 1, 2, & 4)

Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>After conducting several on–site reviews, the Board realized that DOE did not have an adequate understanding of the potential hazards that lightning might pose to nuclear explosive operations at the Pantex Plant. In September 1997, the Board requested that DOE re–analyze the nuclear explosive hazards posed by lightning, identify the additional controls necessary to prevent and mitigate those hazards, and develop a path forward for maintaining the needed controls. As a result, DOE identified and installed many additional protective measures, such as: electrically bonding metallic penetrations, surge protectors, and isolation requirements to prevent electrical energy from being inadvertently applied to explosive circuits. These added measures should render nuclear explosive operations at Pantex less vulnerable to threats from lightning.</p> <p>The Board's staff identified several design and equipment deficiencies in Enriched Uranium Operations (EUO) at Oak Ridge Y–12 related to electrical and fire protection systems, such as: emergency lights, electrical distribution systems, lightning protection systems, and combustible loading. As a result of a Board letter on these issues, DOE is in the process of developing and implementing corrective actions. The completion of these corrective actions will significantly improve the safety posture of the EUO effort, which successfully restarted uranium metallurgical operations in support of a high–priority national security task in June 1998.</p> <p>Throughout 1997, DOE continued work on a plan to move all pits out of Zone 4 magazines and into Zone 12 facilities to reduce the overall Pantex Plant footprint. Building 12–66 had been selected as the target facility for consolidating all of the surplus pits. However, Board staff reviews of this facility identified issues with its safety basis. As a result of interactions with the Board and staff, DOE re–evaluated the safety basis for its plan to use Building 12–66 for storage of surplus pits, and subsequently withdrew the plan in December 1997.</p>	<p>a. The Board and its staff conduct reviews of stockpile management operations at the Pantex Plant involving two weapons in the enduring stockpile. The intent of these reviews is to determine whether DOE is continuously improving the safety of stockpile surveillance operations, by:</p> <ul style="list-style-type: none">capturing and utilizing relevant safety–related information from the Core Surveillance Program, production plant and laboratory experience, and the Enhanced Surveillance research and development program, andimproving and updating system–specific Weapons Safety Specifications (WSS) and/or Hazard Analysis Reports (HAR). <p>The weapons selected for Board and staff review will include, if possible, one bomb and one warhead, and one weapon designed by Lawrence Livermore National Laboratory (LLNL) and one by Los Alamos National Laboratory (LANL).</p> <p>b. The Board and its staff conduct one special study of unique or significant hazards at a DOE stockpile management facility. The intent of this review is to confirm the adequacy of hazard or accident analysis relating to unique or significant hazards of the DOE weapons complex (e.g., airplane crash or on–site transportation).</p> <p>c. The Board and its staff review the adequacy of safety basis analyses for three weapons activities or facilities at sites such as:</p> <ul style="list-style-type: none">the Pantex Plant,Oak Ridge Y–12,the Savannah River Site (SRS) tritium facilities,LLNL, orLANL.	<p>The Board and its staff conduct the following reviews. Selection of the specific focus of each review is based on relative hazards, and on DOE's schedule and progress on the candidate weapon activities:</p> <p>a. <u>WSSs and/or HARs for two nuclear weapon activities.</u> Ideally, one bomb and one warhead, and one LLNL and one LANL weapon will be selected. One intent of these reviews is to determine whether DOE's update of each WSS and HAR captures relevant safety–related information from the Core Surveillance Program, production plant and laboratory experience, and the Enhanced Surveillance Program.</p> <p>b. <u>One special study of unique or significant hazards at a DOE weapons facility.</u> One intent of this review is to confirm the continuing adequacy of hazard or accident analysis.</p> <p>c. <u>The safety basis analysis and change control for three nuclear weapons activities or facilities.</u> The intent of these reviews is to determine whether safety information is adequately derived and captured in authorization basis documents, and to promote continuous improvement. Priority candidates for review include:</p> <ul style="list-style-type: none">the Pantex Plant,Oak Ridge Y–12,SRS tritium facilities, andweapons program activities at LLNL or LANL. <p><u>For all of the above reviews,</u> and on a schedule that supports DOE's operational plans, the Board or its staff communicate results with an emphasis on those issues that will require DOE's attention to provide for adequate protection of the worker, public, and the environment.</p>	<p>a. <u>Output:</u> Two reviews are completed of WSS and/or HAR documents and results are communicated to DOE by the Board or its staff.</p> <p>b. <u>Output:</u> One special hazards review is completed and results are communicated to DOE by the Board or its staff.</p> <p>c. <u>Output:</u> Three reviews of safety basis analysis/ change control are completed and results communicated to DOE by the Board or its staff.</p> <p>Expected Outcome: DOE appropriately addresses Board and staff observations, resulting in improved understanding and availability of safety information concerning nuclear explosive operations and other defense nuclear activities. This will enhance DOE's control of the hazards associated with the production, assembly and disassembly, testing, and storage of nuclear weapons and/or weapons components.</p>

3.2.3 MANAGEMENT AND STEWARDSHIP OF THE NATION'S STOCKPILE AND NUCLEAR WEAPONS COMPONENTS

Objective –	II–A. Cause DOE to improve the collection, analysis, and availability of information related to safety, as part of its weapons stockpile stewardship and management program.		
Action Plan –	2. Evaluate DOE’s monitoring of the effects of stockpile aging and offer timely guidance on health and safety issues affecting these operations. Verify that any identified safety impacts of stockpile aging are communicated to responsible officials and are addressed in a timely manner. (Goals 1 & 2)		
Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>In December 1997, the Board issued a technical report, <i>Review of the Safety of Storing Plutonium Pits at the Pantex Plant</i>, which identified shortcomings in DOE's efforts to develop upgraded containers and facilities for storing plutonium pits. This report discussed the need for DOE to apply a systems approach to develop a pit storage system that would comprehensively consider the interrelationships among the barriers that protect against release of radioactive material, as well as the programs and controls needed to maintain these barriers. As a result, DOE is working to identify more rigorously the requirements for new pit containers and to develop an integrated plan for improving pit storage and surveillance at Pantex.</p> <hr/> <p>The Board issued a classified technical report, <i>Surveillance of Nuclear Weapon High-Explosive Operations at Pantex</i>, which documented a staff review of DOE’s surveillance program that focused on the main charge high explosives in those nuclear weapons in the enduring stockpile. The Board’s focus in this review was whether the aging of explosive materials, as detected during surveillance activities, could have safety implications for nuclear explosive operations (both dismantlements and operations in support of the enduring stockpile). The Board indicated that DOE should consider improving some elements of the surveillance program, such as increasing the high explosive sampling frequency for older weapons awaiting dismantlement. Since the Board’s report was issued, there have been noticeable improvements observed in the surveillance program in some of the areas highlighted in the report.</p>	<p>a. Determine whether potential safety implications of age–related changes in components in the W76, W78, or B83 are addressed through research and evaluations. An intent of this review is to confirm that DOE uses relevant aging–related information from manufacturing plant surveillance and laboratory research/testing to improve and update system–specific WSSs and/or preliminary HARs for these enduring stockpile weapons, as necessary.</p> <p>b. Determine whether DOE’s nuclear explosive operations for weapons dismantlement and for support of the enduring stockpile reflect due consideration of any safety implications associated with the aging or other degradation of explosive materials.</p>	<p>The Board and its staff assess the following technical areas:</p> <p>a. DOE’s efforts to address safety issues of aging–related changes in nuclear weapons components for one weapon in the enduring stockpile. The primary intent of this review is to confirm that these issues are addressed through research and evaluation of data derived from Enhanced Surveillance Program models and relevant information from production plant and laboratory/testing facility experience, and that the appropriate WSS and HAR is updated.</p> <p>b. Research and modeling efforts to evaluate the aging effects of insensitive high explosives, with a special focus on composite systems containing both conventional and insensitive high explosives.</p>	<p>a. <u>Output</u>: One assessment of aging–related phenomena is conducted and review results are communicated to DOE by the Board or its staff.</p> <p>b. <u>Output</u>: One assessment of research and modeling of aging effects on explosives is conducted and review results are communicated to DOE by the Board or its staff.</p>

3.2.3 MANAGEMENT AND STEWARDSHIP OF THE NATION’S STOCKPILE AND NUCLEAR WEAPONS COMPONENTS

Objective –	II–B. Confirm that the maintenance and modification of the nuclear weapons stockpile and associated research and development are performed safely using an integrated safety management (ISM) approach that adequately controls the hazards associated with these activities.		
Action Plan –	1. Through design reviews, special studies, operational analysis, and use of the guidance in Recommendation 95–2, <i>Safety Management</i> , confirm DOE has established integrated authorization bases, including controls that are derived from safety analyses and are tailored adequately to the hazards of activities relating to stockpile management and stewardship. (Goals 1, 2, & 3)		
Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>As a result, in part, of Board and staff reviews of major facilities upgrades in support of stockpile management operations at LANL (and an associated Board reporting requirement), LANL and DOE have both reorganized and committed to improving project management of new construction projects and facility upgrades. In addition, DOE and LANL have committed to developing systematic life-cycle analysis, safety design criteria, and appropriate project management controls for Stockpile Management projects. This effort will help ensure that DOE and LANL establish a comprehensive ISM System that covers all life-cycle phases of facilities at the laboratory.</p> <p>The Board closely followed DOE’s and its contractor’s efforts to restart initial operations for EUO at Oak Ridge Y–12. In several letters to DOE, the Board noted lack of appropriate identification of safety controls for the ventilation system, dry vacuum system, casting furnace water detection system, and some fire patrols. In response, DOE created several new safety controls and resolved deficiencies such that uranium casting operations were successfully restarted in June 1998.</p> <p>Throughout 1997, the Board closely followed DOE’s efforts to restart the Pantex Plant dynamic balancer, where warheads undergo dynamic balancing and product-of-inertia testing. The Board issued three letters and interacted frequently with DOE to improve these conditions. In addition, the Board’s staff helped DOE, the weapons design agencies, and the Pantex Plant contractor identify the hazards of concern and the appropriate controls. The dynamic balancer is now back in normal operation with significantly improved safety controls.</p> <p>The Board has closely monitored preparations for initial operations in the Device Assembly Facility at the Nevada Test Site (NTS). In April 1997, the Board noted that the facility had many elements of a satisfactory ISM System, but some improvements (specifically in the identification of safety controls) were needed. The letter also noted issues requiring DOE’s attention associated with the fire protection system, the acceptance testing program, and the emergency response program. In November 1997, the staff observed DOE’s operational readiness review and noted that the facility has made significant safety improvements. The facility has now begun initial operations to support experiments at the NTS.</p>	<p>a. Determine whether the authorization basis controls that are established for weapons complex activities adequately address the associated hazards, by evaluating the safety controls selected for three activities, such as:</p> <ul style="list-style-type: none">• weapons programs at the Pantex Plant,• activities at Oak Ridge Y–12,• activities at an SRS tritium facility, or• new stockpile management or stewardship activities at LANL or LLNL.	<p>a. The Board and its staff evaluate the safety controls selected for three hazardous weapons complex activities and communicate results with emphasis on any findings that will require DOE attention to provide for adequate protection of the worker, public, or the environment. The intent of these reviews is to determine whether the control sets derived adequately address the associated hazards.</p> <p>Priority candidate activities or facilities for review include those at:</p> <ul style="list-style-type: none">• the Pantex Plant;• Oak Ridge Y–12;• SRS tritium facilities;• LLNL, LANL, or the Sandia National Laboratories (SNL). <p>Selection for review is based on relative hazards, and on DOE’s schedule and progress on the candidate activities.</p>	<p>a. <u>Output</u>: Evaluations are conducted of the control sets selected for three hazardous weapons complex activities and evaluation results are communicated to DOE by the Board or its staff.</p> <p><u>Expected Outcome</u>: DOE appropriately addresses Board and staff observations, resulting in enhanced safety management programs for hazardous weapons complex activities.</p>

3.2.3 MANAGEMENT AND STEWARDSHIP OF THE NATION'S STOCKPILE AND NUCLEAR WEAPONS COMPONENTS

Objective –	II–B. Confirm that the maintenance and modification of the nuclear weapons stockpile and associated research and development are performed safely using an integrated safety management (ISM) approach that adequately controls the hazards associated with these activities.
Action Plan –	2. Through reviews at weapons complex sites, confirm that DOE and its contractors are following agreed-upon controls, procedures, policies, and practices for activities relating to the safe management of the nuclear weapons stockpile. (Goals 1, 2, 4 & 5)

Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>The Board issued two letters to DOE forwarding observations on DOE's process to assess the nuclear explosive safety (NES) implications of changes to operations at Pantex. This resulted in DOE acknowledging that the evaluation of changes could benefit from a different change control review process. DOE has committed to revise its NES change control process to be consistent with DOE's policy for similar processes at other defense nuclear facilities.</p> <p>The Board and its staff have conducted several reviews of restart efforts for EUO at Oak Ridge Y-12 to support a high-priority national security task. The Board's actions facilitated the safe restart of uranium casting operations in June 1998 and the planning for future EUO activity restarts.</p> <p>During the last year, the Board placed considerable emphasis on the safety management program at LANL's Chemistry and Metallurgy Research Facility (CMR). As a result, LANL reorganized its line management structure and revised the facility safety management system. After considerable effort by both DOE and the laboratory, and with extensive Board oversight and constructive engagement, CMR is operating with a greater assurance that appropriate safety requirements are being followed.</p> <p>For several years, the Board has worked with DOE to improve the directives affecting the safety of nuclear explosive operations. However, implementation of the new directives (which are pivotal to the standards-based safety management program for nuclear explosive operations) has not proceeded as rapidly as anticipated. Of particular note is the lack of definitive guidance for preparing HARs for nuclear explosive operations. Through Board letters to DOE on various weapons programs (e.g., W69 operations) and Recommendation 93-1 implementation issues, the Board has continued to encourage DOE to develop a comprehensive standard for HARs that can be effectively implemented by DOE and its contractors.</p>	<p>a. Evaluate the adequacy of approved activity-specific hazard analysis, control identification, and control implementation processes for <u>ongoing</u> activities at three of the four stockpile management sites [i.e., the Pantex Plant, Oak Ridge Y-12, LANL, or SRS]. The focus of these evaluations will include whether effective feedback and improvement programs are being executed.</p> <p>b. Confirm that ISM is in place and effective before new weapons activities are started by evaluating the implementation of authorization basis controls during three DOE/contractor operational readiness determinations, such as: Operational Readiness Reviews (ORR) or Safety Evaluations at the Pantex Plant; ORR for Phase-B EUO restart at Oak Ridge Y-12; or readiness reviews for stockpile management work at LANL.</p> <p>c. By performing three reviews of specific safety management functional areas (e.g., training, work planning, or conduct of operations, configuration management, unreviewed safety question determination, or criticality safety) at selected weapons complex sites, determine whether safety-related requirements in authorization bases are implemented by the use of appropriate contractor procedures and work packages, are followed consistently, and that DOE and contractor feedback and improvement efforts are effective.</p>	<p>a. The Board and its staff evaluate the execution of three ISM work-planning processes (i.e., activity-specific hazard analysis, identification, and implementation of safety controls) for new stockpile management activities at the following sites: the Pantex Plant, Oak Ridge Y-12, LANL, and SRS tritium facilities.</p> <p>b. The Board and its staff observe and assess three DOE/contractor ORRs or other readiness determinations for new stockpile management activities. Priority candidates for review include: Integrated Readiness Reviews at the Pantex Plant, the ORR for uranium conversion and reduction processes in EUO at Oak Ridge Y-12, or readiness reviews for stockpile management work scheduled at LANL and SRS tritium facilities.</p> <p>c. The Board and its staff conduct reviews of the implementation of two cross-cutting functional areas, at either the Pantex Plant, Oak Ridge Y-12, LANL, or SRS tritium facilities. Results are provided to DOE with emphasis on any safety-related issues meriting additional attention. Priority candidate functional areas for review include:</p> <ul style="list-style-type: none"> • training, • radiological protection, • criticality safety conduct of operations, • configuration management, • unreviewed safety question determination, or • line management self-assessment. <p><u>For all of the above efforts</u>, selection for review is based on relative hazards, and on DOE's schedule and progress on the candidate activities.</p>	<p>a. <u>Output</u>: Three evaluations of ISM work-planning processes are conducted and review results are communicated to DOE by the Board or its staff.</p> <p>b. <u>Output</u>: Three observations of DOE/contractor readiness determinations are conducted and review results are communicated to DOE by the Board or its staff.</p> <p>c. <u>Output</u>: Two reviews of cross-cutting functional areas are conducted and review results are communicated to DOE by the Board or its staff.</p> <p>Expected Outcome: DOE implements value-added safety improvements, or an adequate approach and schedule for implementation is developed; DOE is using the information gained to improve the safe performance of activities associated with the maintenance and modification of the enduring nuclear weapons stockpile.</p>

3.2.3 MANAGEMENT AND STEWARDSHIP OF THE NATION'S STOCKPILE AND NUCLEAR WEAPONS COMPONENTS

Objective –	II–B. Confirm that the maintenance and modification of the nuclear weapons stockpile and associated research and development are performed safely using an integrated safety management (ISM) approach that adequately controls the hazards associated with these activities.
Action Plan –	3. Review research and experimentation related to the safety of nuclear weapons to verify execution of an ISM System. (Goals 1, 2, 3, 4 & 5)

Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>Throughout the last year, the Board and its staff engaged DOE and LANL on the development of hazards analyses and an associated set of safety controls for dynamic experiments at Los Alamos. As a result of the Board's actions, changes were made to more fully ensure that the overall safety management strategy for these experiments, which are essential to DOE's Stockpile Stewardship program, will provide adequate protection.</p> <p>The Board and staff conducted several reviews of weapons-related activities at the LLNL Plutonium Facility (in Standby mode since July 1997). The Board and its staff monitored the on-going efforts of LLNL to develop and implement an ISM System at the Plutonium Facility and the remainder of the Superblock on a top priority basis. The Board's efforts have spurred improved work management processes and an upgraded Plutonium Facility Resumption Plan. Specific operations have resumed after implementing improvements such as upgraded procedures, clarified responsibilities for safety functions and systems, and upgraded training of Fissile Material Handlers.</p> <p>The Board and its staff have closely monitored the development and evolutionary implementation of the ISM System for subcritical experiments at the Nevada Test Site (NTS). In June 1998, the Board issued a letter noting the progress that DOE and the weapons laboratories have made with this program, to date, and highlighting improvements that are still needed in the identification and implementation of specific safety controls.</p> <p>Through a Board letter in April 1998, and Board and staff interaction with LLNL and the DOE–Oakland Operations Office, the Board has positively influenced LLNL to develop lists of standards and requirements for safe operations of nuclear facilities (i.e., the LLNL Work Smart Standards set). LLNL had concentrated on technical standards (e.g., fire protection and radiation protection) and deferred consideration of ISM System requirements (e.g., worker protection, safety analysis, and occurrence reporting). As a result of the Board's actions, LLNL is continuing to apply all DOE health and safety directives and standards currently listed in its contract and has renewed development of its Work Smart Standards set to include both technical and ISM standards and programs.</p>	<p>a. Evaluate the adequacy of the execution of approved ISM processes for activity-specific hazards analysis, controls identification, and controls implementation for one <u>ongoing</u> research and development activity related to the safety of the weapons work at SNL, Oak Ridge Y–12, or the Pantex Plant. The focus of these evaluations will include whether effective feedback and improvement programs are being executed.</p> <p>b. Confirm that ISM is in place and effective before new activities are started by evaluating the adequacy of the execution of approved ISM processes for activity-specific hazards analysis, controls identification, and controls implementation for two <u>newly-initiated</u> weapons research and development activities at sites with facilities listed as top priority for ISM implementation in DOE's Implementation Plan for Board Recommendation 95–2 (i.e., LANL or LLNL), or at the NTS for subcritical experiments. The focus of these evaluations will include work planning for newly-initiated weapons research and development activities, and whether effective feedback and improvement programs are being executed.</p>	<p>a. The Board and its staff assess the execution of one ISM work-planning process (i.e., activity-specific hazard analysis, controls identification, and implementation of safety controls) for a Stockpile Stewardship research and development activity at one of the following candidate sites: LANL, LLNL, SNL, or NTS.</p> <p>b. The Board and its staff assess two DOE/contractor operational readiness reviews or other readiness determinations for new Stockpile Stewardship activities. Priority candidates for review include: dynamic experiments at LANL and subcritical experiments at NTS.</p> <p>c. The Board and its staff conduct reviews of the implementation of two cross-cutting functional areas, at either LANL, LLNL, SNL, or NTS. Review results are provided to DOE on any identified issues. Priority candidate functional areas for review include:</p> <ul style="list-style-type: none"> • training, • radiological protection, • criticality safety conduct of operations, • configuration management, • unreviewed safety question determination, and • line management self-assessment. <p>For all of the above efforts, selection for review is based on relative hazards, and on DOE's schedule and progress on the candidate activities.</p>	<p>a. <u>Output</u>: One review is conducted of ISM work-planning processes and review results are communicated to DOE by the Board or its staff.</p> <p>b. <u>Output</u>: Observations are conducted of two startups or restarts and review results are communicated to DOE by the Board or its staff.</p> <p>c. <u>Output</u>: Two reviews of cross-cutting functional areas are conducted and review results are communicated to DOE by the Board or its staff.</p> <p>Expected Outcome: DOE implements value-added safety improvements, or an adequate approach and schedule for implementation is developed; DOE is using the information gained to improve the safe performance of research and development activities associated with the Stockpile Stewardship mission.</p>

3.2.3 MANAGEMENT AND STEWARDSHIP OF THE NATION'S STOCKPILE AND NUCLEAR WEAPONS COMPONENTS

Objective –

II–C. Verify that the permanent dismantlement of retired nuclear weapons and the disposition of components are completed safely in an integrated manner appropriate to the hazards of these operations.

Action Plan –

1. Through reviews conducted by the Board's site representatives and site visits by subject matter experts, confirm that dismantlement of nuclear weapons is performed safely through the use of an ISM approach that adequately controls the related hazards. (Goals 1, 2, 3, 4 & 5)

Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>The Board has been actively involved in reviewing the W69 Dismantlement Program. Several constructive safety measures were identified by the Board and transmitted to DOE in three letters covering lightning hazards, deficiencies in structural integrity of the building in which the dismantlement operations are to be conducted, and the need for safety considerations to factor into selecting facilities for hazardous operations. The operational safety of this activity was significantly improved by administrative controls and physical modifications that were implemented in response to the Board's letters.</p> <p>The Board and its staff positively influenced the safety management plans for the W79 Dismantlement Program. In September 1997, the Board highlighted shortcomings in the W79 Project Team's preparations for a readiness review of dismantlement operations. The Board also noted several safety issues concerning the flammability of the solution used to dissolve high explosives, controls for the hot water heating system, ignition sources (particularly electrostatic discharge), combustible loading and fire protection, documentation of controls, and change control. Through Board interactions and continued staff reviews, DOE and the W79 Project Team were able to identify the appropriate hazards and implement an effective set of controls to support successful review and startup of dismantlement operations in June 1998.</p>	<p>a. Verify the initial implementation of DOE's new Integrated Safety Process for the W56 weapon dismantlement campaign, and for any other new weapon dismantlement campaigns. The intent of these Board and staff reviews is to confirm that the dismantlement procedures resulting from the Integrated Safety Process incorporate the principles of ISM, resulting in adequate control of the hazards.</p> <p>b. Verify the continuing safety of the ongoing W79 weapon dismantlement operation and confirm that the safety controls are being effectively implemented and maintained.</p> <p>c. Determine the adequacy of the ISM System at Oak Ridge Y–12, particularly the application of the approved processes for hazards analysis and safety controls identification for the dismantlement of secondary systems.</p>	<p>a. The Board and its staff assess continuing implementation of DOE's Integrated Safety Process for new dismantlement campaigns at the Pantex Plant. The intent of these assessments is to determine whether this management process incorporates the principles of ISM in a manner that adequately controls the associated hazards.</p> <p>b. The Board and its staff assess the ISM System for one ongoing dismantlement campaign at the Pantex Plant. The intent of this assessment is to confirm that the associated safety controls are being effectively implemented and maintained.</p> <p>c. The Board and its staff assess the adequacy of the ISM System and the safety controls identified for new secondary component dismantlement activities at Oak Ridge Y–12.</p>	<p>a. <u>Output</u>: Assessments are conducted of the Integrated Safety Process for new dismantlement campaigns, and review results are communicated to DOE by the Board or its staff.</p> <p>b. <u>Output</u>: One assessment is conducted of the implementation of the ISM System for an ongoing dismantlement campaign and review results are communicated to DOE by the Board or its staff.</p> <p>c. <u>Output</u>: Assessments are conducted of the ISM System for all secondary dismantlement activities, and review results are communicated to DOE by the Board or its staff.</p> <p><u>Expected Outcome</u>: DOE implements value-added safety improvements, or an adequate approach and schedule for implementation is developed; DOE is using the information gained to ensure that the dismantlement of each retired nuclear weapon and secondary component can be completed safely.</p>

3.3 HAZARDOUS REMNANTS OF WEAPONS PRODUCTION

3.3.1 Overview

More than fifty years of nuclear weapons production have yielded a hazardous collection of surplus, legacy materials consisting of radioactive and chemically reactive metals, residues, spent fuel, and wastes throughout the DOE complex. These include, among others: nearly 60 million gallons of highly radioactive wastes; unprocessed plutonium solutions; thousands of drums of plutonium- and uranium-bearing residues awaiting processing; and more than 2000 tons of degraded irradiated uranium fuel awaiting stabilization. Left unremediated, these materials represent a significant threat to the workers' and the public's health and safety.

It is the Board's intention to ensure that the DOE places a high priority on reducing the risks that these high hazard materials pose and to monitor the operations and activities involved in cleanup of defense nuclear facilities. Through its oversight of DOE defense nuclear facilities, the Board seeks to ensure that DOE's stabilization and storage programs are performed safely and consistently, and will encourage the DOE to complete these activities without undue delay.

The Board's Strategic Plan identifies two specific objectives that the Board believes should be pursued to ensure and improve the safe cleanup of DOE defense nuclear facilities:

- III-A. Verify that the DOE properly characterizes, stabilizes, processes, and safely stores plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program and that the DOE provides for their expeditious disposal, as needed.
- III-B. Confirm that the DOE aggressively pursues the safe deactivation of excess defense nuclear facilities which pose a high risk to workers or the public.

Objective III-A requires that material to be stabilized is adequately characterized to allow development of appropriate methods for stabilization and processing or identification of safety problems associated with extended storage. Since some materials were not well characterized, this requirement is emphasized as well as the development of new methods for early assessment of safety issues.

Objectives III-A and III-B utilize the tenets of integrated safety management (as described in the Board's Recommendation 95-2) to assess the adequacy of DOE's preparation for stabilization, processing of storage activities as well as for all deactivation activities.

Many of the activities the DOE must accomplish to reduce risk presented by the legacy materials and to deactivate its excess facilities are unique, one-of-a-kind operations. The goal of the Board's efforts is to ensure that these activities can be accomplished safely, thereby providing adequate protection to the public, workers, and the environment. To accomplish this goal, the

Board and its staff attempt to bring a structured approach to the activity. This structured approach has been recommended in Recommendation 95–2 to achieve integrated safety management. A graded approach based on the hazards is used to select activities and functional safety areas to review. The very conduct of the staff's reviews brings a certain structure to the activities.

Using the tenets of integrated safety management, the reviews in this strategic area of concentration are focused on identifying the hazards, determining the controls that are needed to prevent or mitigate the hazard, implementing safety controls associated with the various activities, and providing feedback for the next activity to be performed. A measure of the Board's success is DOE's ability to safely accomplish, in a prioritized manner, the activities needed for ongoing reduction of the risks associated with nuclear weapons production legacy materials.

The Board believes that specific actions currently planned for FY 1999 and FY 2000 to advance each of these objectives are possible and desirable. These actions, which are specified in the following tables, build on the Board's activities and achievements of past years in technically rigorous oversight and constructive interaction with the DOE. Examples of the related FY 1998 performance accomplishments that have supported these objectives are also provided in the following tables. All such activities and accomplishments have been publicly identified in documents such as the Board's Annual Reports, letters, technical reports, and previous budget requests. The Board's action plans described in the following tables are also based on its assessment of progress expected in FY 1999 and major DOE efforts planned during FY 2000, which in turn are predicated on many factors, most importantly—DOE's budget and its accomplishments during this period.

3.3.2 Adjustments to the FY 1999 Performance Goals

FY 1999 performance goals have been modified slightly to reflect the changing schedules of DOE activities driven by revised priorities:

Objective/Action III–A.1: In the case of processing high-level waste at the Savannah River Site, In-Tank Precipitation has been terminated due to excessive benzene generation and associated explosion concerns; alternative methods are being considered. The new goal is for the Board to ensure that the process selected by the DOE is safe, technically acceptable, and adequately demonstrated in pilot operations. An appropriate measure is evaluating the adequacy of the alternatives and issuing a report on the results.

Objective/Action III–A.2: Specific activities at Savannah River, Hanford, and RFETS have been substituted for more general ones previously identified or for activities no longer being considered by the DOE.

3.3.3 HAZARDOUS REMNANTS OF WEAPONS PRODUCTION

Objective –	III–A. Verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium and other actinides, residues, spent fuel, and wastes from the nuclear weapons program and that DOE provides for expeditious disposal, as needed.
Action Plan –	1. Through technical exchanges with DOE, and formal recommendations where appropriate, ensure that high risk activities during deactivation are addressed early, using demonstration projects to develop competence. (Goals 2, 3, 4, 5 & 7)

Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>High-level wastes at Hanford were not well characterized. In response to aggressive pursuit by the Board of Recommendation 93-5, DOE has conducted characterization and is expected to close the organic solvent and organic complexant safety issues for the Hanford tank farms by the end of FY 1998. This action adds to the earlier closure of the ferrocyanide/nitrate and nuclear criticality safety issues for the tank farms, leaving the flammable gas safety issue as the sole known unresolved safety concern to be pursued.</p> <p>There are potential radiation exposures and industrial accidents associated with processing low-risk residues. The Board, in a January 1998 letter, noted that many of the concerns with the low-risk residues would be alleviated by entombment without further processing. To achieve this risk reductive objective, the Board staff reviewed the Rocky Flats Environmental Technology Site's (RFETS) residue characterization plan and noted that the sampling and characterization were not sufficiently conservative to ensure residues did not require stabilization before disposal. Better characterization is now being accomplished which will allow classifying residues as low risk. This will allow the acceleration of risk reduction at RFETS and the earlier disposal of residues without compromising safety.</p> <p>Concerns with storage of Uranium-233 (U-233) were not being adequately addressed by DOE. During FY1998, in response to Board Recommendation 97-1, DOE completed initial site assessments for the Oak Ridge National Laboratory (ORNL), the Idaho National Engineering and Environmental Laboratory (INEEL), and the Los Alamos National Laboratory (LANL) which provides an initial characterization of the U-233 material and storage conditions.</p> <p>There were uncertainties with process safety at the Savannah River Site's (SRS) In-Tank Precipitation (ITP) Facility. In Recommendation 96-1, the Board recommended that DOE thoroughly evaluate the process and develop adequate controls before conducting further large-scale ITP operations. Recent results of the chemistry program confirmed the Board's concerns with this process. DOE notified the Board in January 1998 that work on ITP would be suspended, and that a program to evaluate alternative processes would be undertaken.</p>	<p>a. Assess the adequacy of DOE's progress on characterization activities to identify potentially hazardous conditions at:</p> <ul style="list-style-type: none"> Hanford – satisfactory closure of safety issues for storage, retrieval and processing of high level tank wastes, RFETS – safe processing and storage of residues, ORNL, INEEL, and LANL – safe storage. <p>b. Conduct an annual assessment of research and development efforts associated with key efforts for safe treatment and storage of high risk residues, spent fuel and waste. The intent of this review is to confirm that these research and development efforts adequately address identified technology gaps.</p> <p>c. Review the technical adequacy of the DOE standard being prepared for storage of uranium-bearing materials, and identify any areas that require improvement.</p> <p>d. Determine whether the process selected for processing high-level, cesium-bearing waste in the ITP facility at SRS is safe, technically acceptable, and has been adequately demonstrated in pilot operations.</p>	<p>a. The Board and its staff review three DOE efforts to characterize material before processing and storage and, on a schedule that supports DOE's operational plans, communicate any identified issues that will require resolution to provide for adequate protection of the worker, the public, and the environment.</p> <p>Primary candidate activities for review include:</p> <ul style="list-style-type: none"> Hanford – Continued characterization of radioactive tank wastes and justification for closure of the flammable gas safety issue associated with its storage (<i>Recommendation 93-5</i>), RFETS – Safety issues associated with the interim storage, disposal, and processing of residues (<i>Recommendation 94-1</i>), and ORNL – Safe repackaging and storage of U-233 (<i>Recommendation 97-1</i>). <p>Selection for review is based on relative hazards, and on DOE's schedule and progress on the candidate activities.</p> <p>b. The Board and its staff conduct an annual assessment of DOE's research and development efforts. Research and development efforts should adequately address technology gaps for key stabilization, processing, and storage activities for high risk residues, spent fuel, plutonium, uranium, and wastes (<i>Recommendation 94-1</i>).</p>	<p>a. Output: Three reviews of characterization activities are completed and results are communicated to DOE by the Board or its staff.</p> <p>b. Output: An annual review of research and development efforts is completed and results are communicated to DOE by the Board or its staff.</p> <p>Expected Outcome: Identified issues are resolved, or an adequate approach and schedule for resolution is developed for these high-risk activities; DOE has incorporated the operational lessons learned and research and development results into ongoing stabilization programs, as applicable.</p>

3.3.3 HAZARDOUS REMNANTS OF WEAPONS PRODUCTION

<p>Objective –</p> <p>Action Plan –</p>	<p>III–A. Verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium and other actinides, residues, spent fuel, and wastes from the nuclear weapons program and that DOE provides for expeditious disposal, as needed.</p>		
	<p>2. Utilizing a combination of dedicated technical staff assets and full–time site representatives, perform specialized technical reviews to ensure that stabilization, processing, and storage are conducted safely using proven technologies. Provide prompt identification of emerging problems with stabilization that require immediate resolution by DOE. (Goals 2, 3, 4, 5 & 7)</p>		
Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>As stated in Recommendation 94–1, materials throughout the DOE weapons complex that are hazardous remnants of weapons production required stabilization for safe storage. The Board’s staff conducted reviews to determine whether hazards were analyzed, safety controls were implemented, and work was being safely performed in accordance with the precepts of Integrated Safety Management (ISM). As a result, DOE safely achieved the following during FY 1998:</p> <ul style="list-style-type: none"> – RFETS – the remaining solutions in tanks were drained and processed, and draining of holdup solutions began; – RFETS – stabilization of plutonium–bearing salt residues began and approximately 1100 kg have been processed; – RFETS – repacking of other residues began; – SRS – restarted HB–Line for dissolution of Pu–239 scrap; – SRS – restarted operations in H–Canyon for stabilization of the defense–related spent nuclear fuel; – SRS – completed dissolution of foreign reactor spent fuel, and sand, slag, and crucible in F–Canyon; – SRS – started repackaging plutonium metal for long–term storage; – SRS – demonstrated direct conversion of classified shapes into plutonium metal buttons. <p>U–233 is stored in potentially unstable conditions at several sites in the DOE weapons complex. In partial response to Recommendation 97–1, DOE identified requirements for a long–term U–233 safe storage system. In July 1998, the Board noted that stronger DOE direction was required. The Board has stressed that a systems engineering approach must be used to define requirements for the long–term storage system and any associated modifications. ORNL has already identified the need for modifications to upgrade the ventilation system of B3019.</p> <p>Disposal of transuranic waste (TRU) at the Waste Isolation Pilot Plant (WIPP) is key to the closure of RFETS and the removal of large quantities of TRU from all other DOE sites. The Board’s staff completed reviews to evaluate WIPP readiness to operate safely. The reviews supported the Board’s letter to DOE that endorsed the approval for WIPP to operate.</p>	<p>a. Determine the adequacy of DOE’s preparations for the following activities:</p> <ul style="list-style-type: none"> • SRS – Review one operational activity at the High–Level Waste Evaporator and Phase III processing of spent nuclear fuel in H–Canyon, • Hanford – Review development of the C–106 sluicing of high–heat waste to Tank AY–102, • RFETS – Assess the adequacy of storage of residues not being shipped to WIPP, • ORNL – Review the removal of uranium deposits in charcoal bed filters at the Molten Salt Reactor Experiment. <p>b. Determine whether DOE has adequately identified needed upgrades to facilities at ORNL, INEEL and LANL for safe storage of U–233.</p>	<p>a. The Board and its staff assess DOE’s preparations for three risk–reduction activities, including DOE’s operational readiness determinations. Using the tenets of ISM, these reviews identify the hazards and safety controls needed to prevent or mitigate each hazard, evaluate implementation of the safety controls, and assess the feedback of lessons learned to the next activity. Accordingly, to determine the adequacy of DOE’s preparations for the selected activities, the Board and its staff evaluate:</p> <ul style="list-style-type: none"> • safety documentation, including hazards analysis and identification of safety controls; • availability of needed engineered safety controls, such as ventilation, fire protection, and processing equipment; • operational readiness for the activity, including provisions for radiation protection, training and qualification of operators, operating procedures, and conduct of operations; and, • conduct of DOE’s and/or its contractor’s readiness determination. <p>Primary candidate activities for these reviews include:</p> <ul style="list-style-type: none"> • SRS – Preparation to pretreat and vitrify americium–curium solutions in F–Canyon (<i>Recommendation 94–1</i>), • Hanford – Movement of spent nuclear fuel from the K–Basins and stabilization of plutonium–bearing solutions in the Plutonium Finishing Plant (<i>Recommendation 94–1</i>), • RFETS – Thermal stabilization and packaging of plutonium metal and oxide (<i>Recommendation 94–1</i>), • ORNL – Stabilization and repackaging of U–233 in B3019 (<i>Recommendation 97–1</i>). <p>Selection of activities for review is based on relative hazards, and on DOE’s schedule and progress on the candidate activities.</p>	<p>a. <u>Output:</u> Three reviews of stabilization processing and storage activities are completed and results communicated to DOE by the Board or its staff.</p> <p><u>Expected Outcome:</u> Identified issues are resolved by DOE prior to startup, or an acceptable post–start resolution plan and schedule is developed so that activities are conducted safely; DOE is utilizing the lessons learned to improve activities associated with the stabilization, processing, and storage of nuclear materials.</p>

3.3.3 HAZARDOUS REMNANTS OF WEAPONS PRODUCTION

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3.3.3 HAZARDOUS REMNANTS OF WEAPONS PRODUCTION

Objective – **III–B.** Confirm that DOE aggressively pursues the safe deactivation of excess defense nuclear facilities which pose a high risk to the workers or the public.

Action Plan – 1. Assess the adequacy of DOE's risk-based approach for deactivation of excess defense nuclear facilities through technical exchanges, issuing technical reports as necessary to provide engineering evaluations, and holding public meetings as appropriate. (Goals 2, 3, 4 & 7)

Examples of FY 1998 Accomplishments	FY 1999 Performance Goals	FY 2000 Performance Goals	FY 2000 Performance Measures
<p>An appropriate set of standards, Orders, and guides for the conduct of deactivation and decommissioning facilities were not in existence at DOE. Based on discussion with the Board, DOE agreed to revise its Order 430.1A, <i>Life Cycle Asset Management</i>, along with associated standards, manuals, and guides. Progress in issuing these revisions has been slow, and the Board met with the Acting Secretary of Energy to expedite resolution of this problem. However, DOE has issued an acceptable standard for the Facility Disposition Process, which provides the technical basis for a revision to the Order.</p> <p>During FY 1998, the Board and its staff have pursued deactivation activities using the tenets of Integrated Safety Management to determine their adequacy. Activities assessed include:</p> <ul style="list-style-type: none"> • Oak Ridge Y-12 – Vulnerabilities were identified in the safety posture of Building 9206. However, progress toward correction has been slow. The Board brought key concerns to the attention of senior DOE management. Attention to these safety matters subsequently resulted in corrective actions being assessed and implemented. • RFETS – the Board's staff has reviewed the safety controls for equipment removal in B779 and B886, plutonium contamination control in B371, and removal of holdup plutonium in B771, so that work is performed safely. • Hanford – the Board's staff noted problems in readiness to perform hazardous work in Building 233-S, the pilot facility for future deactivation work at Hanford. Improvements have been observed over the past year; however, more progress was needed. This led to the Board taking action to alert DOE to the problem. 	<p>a. Confirm the adequacy of plans, standards, procedures, and operational activities at one DOE defense nuclear facility scheduled for early deactivation at RFETS and Hanford, to reduce the risk posed by radioactive materials. Priority candidates for review including B779 at RFETS, and Building 233–S at Hanford.*</p> <p>* Based on the current DOE schedule for deliverables.</p> <p>b. Evaluate ISM work-planning processes for tapping and draining plutonium-bearing process lines in B771 at RFETS.</p>	<p>a. The Board and staff assess the adequacy of plans, standards, and procedures for two DOE defense nuclear facilities scheduled for early deactivation to reduce the risk posed by radioactive materials. These assessments are conducted in collaboration with State and other regulatory authorities, as needed, and on a schedule that supports DOE's operational plans. The Board or staff communicate any identified issues that will require resolution to provide for the adequate protection of the public, worker, and environment.</p> <p>Primary candidates for these assessments include:</p> <ul style="list-style-type: none"> • Hanford – Buildings 324 and/or 327, and • RFETS – B771. <p>b. The Board and its staff evaluate the execution of two ISM work-planning processes (i.e., activity-specific hazards analysis, identification and implementation of safety controls) for first-time deactivation activities.</p> <p>Priority candidate activities for these evaluations include:</p> <ul style="list-style-type: none"> • RFETS – Review glove box removal and size reduction, tank size reduction, and/or ventilation system removal in B771, and • Hanford – Review one activity. <p><u>For both of the above goals:</u> Selection for review is based on relative hazards, and on DOE's schedule and progress on the candidate activities.</p>	<p>a. <u>Output:</u> Two tailored assessments of facility deactivation plans are conducted and results are communicated to DOE by the Board or its staff.</p> <p>b. <u>Output:</u> Two tailored evaluations of first-time deactivation activities are conducted and results are communicated to DOE by the Board or its staff.</p> <p><u>Expected Outcome:</u> Identified issues are resolved by DOE for high-risk, first-time deactivation efforts, or an adequate approach and schedule for resolution is developed; DOE planning for facility deactivation is continuously improving, based on the Board's communicated review results and lessons learned.</p>

STATUTORY MISSION OF THE BOARD

Congress established the Defense Nuclear Facilities Safety Board (Board) in Public Law 100-456 on September 29, 1988. The statutory mission of the Board includes the following major functions:

- **Review and Evaluation of Standards.** The Board shall review and evaluate the content and implementation of the standards relating to the design, construction, operation, and decommissioning of defense nuclear facilities of the Department of Energy (DOE) including all applicable DOE Orders, regulations, and requirements at each Department of Energy defense nuclear facility. The Board shall recommend to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected. The Board shall include in its recommendations necessary changes in the content and implementation of such standards, as well as matters on which additional data or additional research is needed.
- **Investigations.** The Board shall investigate any event or practice at a Department of Energy defense nuclear facility which the Board determines has adversely affected, or may adversely affect, public health and safety.
- **Analysis of Design and Operational Data.** The Board shall have access to and may systematically analyze design and operational data, including safety analysis reports, from any Department of Energy defense nuclear facility.
- **Review of Facility Design and Construction.** The Board shall review the design of a new Department of Energy defense nuclear facility before construction of such facility begins and shall recommend to the Secretary of Energy, within a reasonable time, such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety. During the construction of any such facility, the Board shall periodically review and monitor the construction and shall submit to the Secretary of Energy, within a reasonable time, such recommendations relating to the construction of that facility as the Board considers necessary to ensure adequate protection of public health and safety. An action of the Board, or a failure to act, under this paragraph may not delay or prevent the Secretary of Energy from carrying out the construction of such a facility.

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

Created as an independent establishment within the Executive Branch, the Board is made up of five Members appointed from civilian life by the President, by and with the advice and consent of the Senate. The Board's enabling statute requires that the Board Members be respected experts in the field of nuclear safety with demonstrated competence and knowledge relevant to the independent investigation and oversight functions of the Board. The Senate confirmed the first five Board Members on October 19, 1989.

OBJECT CLASS SUMMARY

Actual obligations for FY 1998, projected obligations for FY 1999, and the Board's Budget Request for FY 2000 and FY 2001, are presented by object class accounts in Exhibit A on the following page. The Board proposes to utilize the budget resources requested in the following manner:

Salaries and Benefits. The FY 2000 expenditure request includes funding of \$12,956,000 to support the projected salary and benefit costs for the five DNFSB Board Members and 101 full-time staff. As stated earlier, the funding for salaries and benefits represents 74 percent of the Board's FY 2000 Budget Request. In calculating the projected salary needs of the Board, the following federal pay adjustment factors for the Executive Branch employees are used:

- Pay increase of 3.6 percent which was effective in January 1999,
- Pay increase of 4.4 percent beginning in January 2000,
- Pay increase of 3.9 percent beginning in January 2001.

Agency contributions for employees covered by the Civil Service Retirement System increased by 1.51 percent beginning in October 1997. Consequently, employee benefits are estimated at 24 percent of base salaries or \$24,425 per FTE in FY 2000.

In establishing the Board, Congress sought to bring the very 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 has and will continue to be critical to the successful accomplishment of the Board's mission. The Board has assembled a 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 weapons safety, storage of nuclear materials and nuclear criticality safety, and waste management. Therefore, it is of paramount importance that the Board receive 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. Two full-time site representatives are stationed at the Pantex site to oversee nuclear weapons activities including the weapons stockpile stewardship and weapons disassembly programs, and two site

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

FY 2000 AND FY 2001 CONGRESSIONAL BUDGET REQUEST

(Data as of 1/31/99)

BUDGET ACCOUNT	FY 1998 ACTUAL OBLIGATIONS	FY 1999 PROJECTED OBLIGATIONS	FY 2000 BUDGET REQUEST	FY 2001 BUDGET REQUEST
PERSONNEL SALARIES -- (11)	\$8,840,600	\$9,405,000	\$10,367,000	\$10,560,000
PERSONNEL BENEFITS -- (12)	\$2,001,138	\$2,193,604	\$2,589,000	\$2,650,000
TRAVEL -- (21)	\$608,012	\$622,000	\$622,000	\$622,000
TRANSPORTATION OF THINGS -- (22)	\$40,365	\$130,000	\$85,000	\$85,000
RENTAL PAYMENTS TO GSA -- (23.1)	\$1,870,264	\$2,240,000	\$2,400,000	\$2,575,000
COMMUNICATIONS & UTILITIES -- (23.3)	\$108,979	\$139,000	\$110,000	\$110,000
PRINTING & REPRODUCTION -- (24)	\$26,866	\$32,000	\$32,000	\$32,000
CONSULTING SERVICES -- (25.1)	\$1,652,526	\$1,500,000	\$1,000,000	\$450,000
OTHER SERVICES -- (25.2)	\$605,300	\$661,000	\$685,000	\$684,000
GOVERNMENT SERVICES -- (25.3)	\$151,499	\$160,000	\$150,000	\$150,000
SUPPLIES & MATERIALS -- (26)	\$226,502	\$255,000	\$275,000	\$275,000
EQUIPMENT -- (31)	\$450,183	\$227,000	\$225,000	\$160,000
*** TOTAL OBLIGATIONS ***	\$16,582,234	\$17,564,604	\$18,540,000	\$18,353,000
NEW BUDGET AUTHORITY	\$17,000,000	\$16,500,000	\$17,500,000	\$17,500,000
UNOBLIGATED BALANCE - PREV. FY	\$1,703,721	\$2,842,828	\$1,898,108	\$858,108
RECOVERY OF PRIOR YR OBLIGATIONS	\$721,341	\$119,884	\$0	\$0
TOTAL BUDGETARY RESOURCES	\$19,425,062	\$19,462,712	\$19,398,108	\$18,358,108
EST. UNOBLIGATED BAL. - CUR. FY	\$2,842,828	\$1,898,108	\$858,108	\$5,108
APPROPRIATION	\$17,000,000	\$16,500,000	\$17,500,000	\$17,500,000
OUTLAYS	\$16,610,907	\$16,600,000	\$17,500,000	\$17,500,000
STAFF & BOARD MEMBERS (FTE's)	99	106	106	106

representatives are stationed at the Hanford site to monitor waste characterization and stabilization and facility deactivation. The Board has assigned one full-time site representative at Rocky Flats to monitor the DOE effort to deactivate facilities and stabilize and store the large plutonium inventory at the site, and two site representatives at Savannah River to monitor the DOE's efforts to deactivate facilities, stabilize waste materials, and store and process tritium. In June 1998, the Board stationed a full-time site representative to monitor safety and health conditions at Oak Ridge Y-12, ORNL, ETPP, Portsmouth, and Paducah defense nuclear facilities.

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 first-hand 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.

During FY 2000, the Board plans to allocate 2 FTEs and associated support costs to continue its Technical Intern Program which was established in 1991 to supply an entry level source of exceptional engineering undergraduates to be developed into highly qualified, well trained employees for technical positions within the agency. This program has been very effective in recruiting engineering graduates with outstanding academic accomplishments by providing a three-year program of tailored assignments within the Board, graduate school training in nuclear engineering and related engineering areas, and practical field experience.

Travel. The Board requests \$622,000 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 fulfill the Board's statutory mission. 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. During 1998, Board Members, technical staff and the Board's outside technical experts made 196 team visits to major defense nuclear sites in support of its high priority public health and safety 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 first hand information on the demonstrated readiness, capabilities, and performance of the DOE and its contractors for ensuring safety in the conduct of such activities.

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

Transportation of Things. The Board has included \$85,000 in its FY 2000 Budget Request for the shipment of household goods for employees relocating to the Washington, DC area or to DOE sites.

Rental Payments to GSA. The Board requests funds totaling \$2,400,000 to reimburse the General Services Administration (GSA) for projected office rental costs. This overhead expense represents approximately 14 percent of the Board's FY 2000 Budget Request. GSA has established a "New Pricing" policy to be phased in starting in FY 1999 for all new assignments in Government-owned space and by FY 2000 for all existing assignments in Government-owned and leased space. The Board was phased into this "New Pricing" in FY 1999 for the existing lease which began in FY 1995 and expires in FY 2005. The "New Pricing" policy is designed to enable GSA to more fully recover actual costs by applying a pass-through of the direct costs GSA incurs (shell rent, operating expenses, and real estate taxes), plus a management fee. The requested amount also includes \$55,000 for enhanced security measures which were deemed necessary government-wide after the bombing of the Federal building in Oklahoma City. GSA has determined the overall cost for these additional security measures and is dividing the costs among the building tenants based on space occupied. While the Board has had no increase in space since October 1995, nor do we anticipate any expansions, GSA has told us to estimate a 7% increase each year hereafter.

Communications and Utilities. The FY 2000 Budget Request includes \$110,000 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.

Printing and Reproduction. The budget request includes \$32,000 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 the Congress and technical reports, are also included in this account.

Consulting Services. Although authorized by Congress and the President to have up to 150 FTEs, due to budgetary constraints, the Board currently has only 90 full-time staff onboard. While the Board employs a highly capable staff, it is not practical or desirable to have permanent staff skilled in every specialty for which needs occur. For example, the safety evaluation of the In-Tank Precipitation Facility at Savannah River examined the potential buildup of explosive concentrations of benzene vapor in process tanks. Since benzene is not commonly encountered in the DOE weapons complex, outside technical expertise was needed and obtained to review the process safety envelope.

The Board plans to continue to obtain outside technical experts in highly specialized areas. Expertise on the assembly and disassembly of certain specific nuclear weapon components may be needed. Such expertise may be required for short periods with little advance notice should an imminent or severe threat to public health and safety be identified at a DOE defense nuclear facility. Therefore, it is extremely important to have the funds necessary to immediately contract

for this expertise when needed. Each outside 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, is included in Appendix C. The FY 2000 Budget Request includes \$1 million in this account for technical support contracts to assist the Board in its health and safety reviews.

Other Services. The budget request includes \$685,000 to fund the recurring administrative support needs of the Board in FY 2000 such as security services, court reporting expenses, employee training, records storage and retrieval services, and computer network maintenance.

Government Services. The Board's budget request includes \$150,000 to pay the cost of reimbursable support agreements with other federal agencies for administrative services such as accounting, payroll, health unit, and drug-free workplace testing and support.

Supplies and Materials. The Board requests \$275,000 to maintain the technical reference information for its in-house library, as well as for continued access to various technical computer databases, and for general office supplies and materials.

Equipment. The FY 2000 Budget Request includes \$225,000 to maintain the Board's information technology (IT). The Board plans to purchase a new communication server which includes updated ISDN lines for direct access to the network for off-site users. In addition, replacement of computer work stations, software applications and database systems to accommodate Y2K issues and the fast growing technology demands is also planned.

TECHNICAL SUPPORT CONTRACTS SUMMARY

A list of major technical support contracts, with a brief description of each contractor's areas of expertise, is included in this Appendix. The FY 2000 Budget Request includes \$1 million in this account for technical support contracts to assist the Board in its health and safety reviews.

While the Board employs a highly capable staff, it is not practical or desirable to have permanent staff skilled in every specialty for which needs occur. For example, the safety evaluation of the In-Tank Precipitation Facility at Savannah River examined the potential buildup of explosive concentrations of benzene vapor in process tanks. Since benzene is not commonly encountered in the DOE weapons complex, outside technical expertise was needed and obtained to review the process safety envelope.

The Board plans to continue to obtain outside technical experts in highly specialized areas, such as the assembly and disassembly of certain specific nuclear weapon components. Each outside technical expert that the Board employs will continue to be carefully screened for possible conflict of interest.

DEFENSE NUCLEAR FACILITIES
SAFETY BOARD

TECHNICAL SUPPORT CONTRACTS
(Status as of 01/31/99)

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Dr. Harold M. Agnew	02/19/99	Provide expertise related to strategic safety issues associated with those facilities involved in the assembly, disassembly, and testing of nuclear weapons, specifically advising the Board in production, dismantlement/disposition, safe handling, testing, and storage of nuclear weapons, nuclear explosive devices, and nuclear weapon components, and the nuclear and hazardous materials used in these items; as well as assisting the Board in understanding the existing involvement of the design laboratories in these activities, and evaluating the sufficiency of current and proposed efforts.
Briere Associates, Inc.	09/30/99	Provide technical editing services of Board documents that include, but are not limited to technical reports, trip reports, its Annual Report to Congress, and Board Recommendations to the DOE. These services include analyzing manuscripts in terms of its objective, style, and manner of presentation and recommend revisions as appropriate.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
H&H Consultants, Inc.	09/30/99	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 analytical techniques utilized in structural analysis with special emphasis on seismic issues; adequacy of various types of analyses performed by DOE contractors; development and relevancy of standards and criteria used in the design and qualification of DOE facilities; and integration of programmatic structural issues from the overall historical prospective.
Dr. William E. Kastenberg	06/17/99	Provide assistance in the areas of probabilistic risk assessment and human reliability analysis of defense nuclear operations, specifically involving matters associated with the identification of high risk accidents, prioritization of safety related issues, and development of risk based design criteria for facilities handling special nuclear materials.
Dr. J.A. Leary	12/31/99	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 recent work include: evaluation of technologies to stabilize plutonium residues, plutonium storage safety issues, and Rocky Flats plutonium stabilization activities.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Dr. James L. Liverman	04/30/99	Provide technical support to the Board in the general subject area of radiation protection, specifically involving review and evaluation of DOE's Implementation Plan for Board Recommendation 91-6, amendments to 10 CFR 835 Rule, radiological protection standards, and other radiological and environmental health and safety issues.
Management Support Technology, Incorporated	01/31/01	Provide technical support to the Board, specifically involving evaluation of policies, standards, and procedures governing operations and maintenance as the operations and maintenance activities themselves and the training and qualification programs for operations, technical, support, and maintenance personnel. Recent work includes assisting the staff in evaluating the Department of Energy's development and implementation of Integrated Safety Management guidance in response to Board Recommendation 95-2. In addition, assistance has been provided in assessing operations and maintenance at the Savannah River Site, Idaho National Engineering and Environmental Laboratory, and the Rocky Flats Environmental Technology Site as they prepare to restart defense nuclear facilities and activities.
Lary M. McGrew	01/31/00	Provide expertise related to the strategic 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

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Lary M. McGrew (Continued)	01/31/00	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 dismantlement process at the Pantex plant.
Dr. Sol Pearlstein	09/30/99	Provide technical support to the Board specifically related to criticality safety reviews and other related fields including nuclear and reactor physics, and accelerator production of tritium. This effort includes participation in the review of safety analysis reports, DOE facility visits, presentation of lectures on criticality and related technical subjects to the staff, the development of specialized nuclear information or databases for Board applications, and assisting the staff in monitoring DOE performance on specific issues or Board Recommendations.
Paul C. Rizzo Associates, Inc.	09/30/99	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.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
J.D. Stevenson, Consulting Engineer	09/30/99	Provide technical support to the Board, specifically in the review and evaluation of systems and seismic engineering 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 analyses performed by DOE contractors; and hazard and systems classification.
Dr. Gerald Tape	11/30/99	Provide expertise related to strategic safety issues associated with those facilities involved in the assembly, disassembly, and testing of nuclear weapons, specifically advising the Board in production, dismantlement/disposition, safe handling, testing, and storage of nuclear weapons, nuclear explosive devices, and nuclear weapon components, and the nuclear and hazardous materials used in these items; as well as assisting the Board in understanding the existing involvement of the design laboratories in these current and proposed efforts.

FY 2001 BUDGET REQUEST TO THE CONGRESS

Defense Nuclear Facilities Safety Board



February 2000

GPRA STRATEGIC PLANNING REQUIREMENTS

The Government Performance and Results Act of 1993 (GPRA) requires each agency to prepare and submit a strategic plan establishing long-term programmatic, policy, and management goals. The Defense Nuclear Facilities Safety Board's first Strategic Plan was transmitted to Congress and distributed to the public on October 1, 1997 (see the Board's Internet Home Page at www.dnfsb.gov).

Agencies are also required to develop annual performance plans which indicate the progress toward achievement of the strategic plan's goals and objectives. In view of the close relationship between the measurable goals in an annual performance plan and the level of resources requested and subsequently funded, this budget document includes a detailed presentation on the Board's FY 2000 and FY 2001 performance plans, together with examples of performance accomplishments in FY 1999, in Section 3 of this request.

**Defense Nuclear Facilities
Safety Board
FY 2001 Congressional Budget Request**

APPROPRIATION & EXPENSE SUMMARY

(Tabular dollars in thousands).

OPERATING EXPENSES

	ACTUAL FOR <u>FY 1999</u>	PROJECTED FOR <u>FY 2000</u>	BUDGET REQUEST FOR <u>FY 2001</u>
New Budget Authority	16,500	16,935*	18,500
Obligations	17,805	17,984	18,921
Outlays	17,027	17,500	18,000

Authorization: National Defense Authorization Act, Fiscal Year 1989 (amended the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) by adding new Chapter 21 -- Defense Nuclear Facilities Safety Board.

National Defense Authorization Act for Fiscal Year 1991
(P.L. 101-510-Nov. 5, 1990),
National Defense Authorization Act for Fiscal Years 1992 and 1993
(P.L. 102-190-Dec. 5, 1991),
Energy Policy Act of 1992
(P.L. 102-486-Oct. 24, 1992), and
National Defense Authorization Act for Fiscal Year 1994.
(P.L. 103-160-Nov. 30, 1993).

* \$17,000,000 appropriation; \$65,000 rescission.

**Defense Nuclear Facilities
Safety Board
FY 2001 Congressional Budget Request**

PERSONNEL SUMMARY

	<u>FY 1999 ACTUAL</u>	<u>FY 2000 BUDGET PLAN</u>	<u>FY 2001 BUDGET REQUEST</u>
Statutory Personnel Ceiling: (FTE's) ^{1/}	150	150	150
FTE Usage ^{2/}	94	99	105
<hr/>			
Board Members & Permanent Employees at End of Fiscal Year	95	105	105

^{1/} National Defense Authorization Act for FY 1992 and FY 1993, P.L. 102-190, raised the Board's statutory employee ceiling from 100 to 150 full-time staff to accommodate mandated additional nuclear weapons safety 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(A).

^{2/} Includes 5 full-time Board Members.

**Defense Nuclear Facilities
Safety Board
FY 2001 Congressional Budget Request**

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, [17,000,000] \$18,500,000, to remain available until expended. (*Energy and Water Development Appropriations Act, 2000*)

**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD
FY 2001 Congressional Budget Request**

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**Defense Nuclear Facilities
Safety Board
FY 2001 Congressional Budget Request**

1. EXECUTIVE SUMMARY

The Defense Nuclear Facilities Safety Board's (DNFSB or Board) FY 2001 Budget Request is for \$18,500,000 and 105 Full-time Equivalent (FTE) staff years.

As the numbers in the following table illustrate, the Board has not received an annual appropriation that approaches the President's budget request since FY 1995:

<u>Fiscal Year</u>	<u>President's Budget Request</u>	<u>Actual Appropriation</u>	<u>Reduction</u>
FY 1995	\$18,000,000	\$17,865,000	\$135,000
FY 1996	18,500,000	16,978,000	1,522,000
FY 1997	17,000,000	16,000,000	1,000,000
FY 1998	17,500,000	17,000,000	500,000
FY 1999	17,500,000	16,500,000	1,000,000
FY 2000	17,500,000	16,935,000 *	565,000

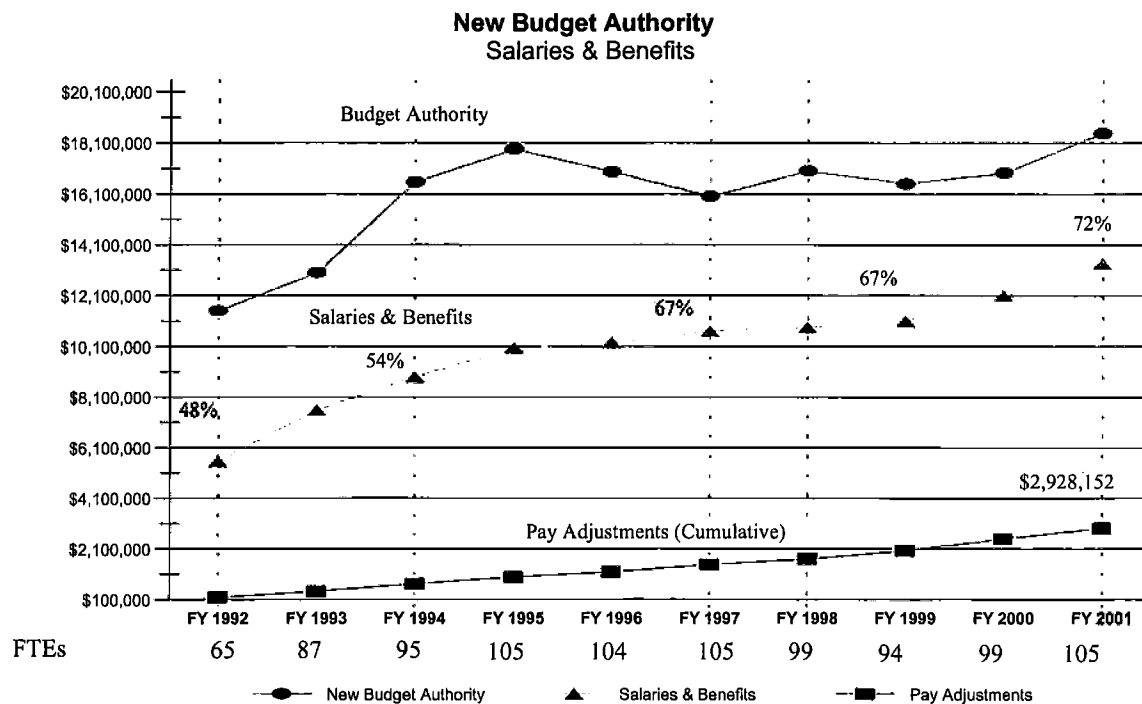
In past fiscal years, the Board has been able to forestall the impact of the above funding reductions by instituting temporary cost savings measures such as reducing expenditures for outside technical experts, and deferring the replacement of technical staff lost due to attrition.

These stopgap expenditure adjustments will no longer compensate for the projected deficits in FY 2001 and beyond. The Board is requesting a significant increase in new budget authority to counter the compounding growth effects in non-discretionary expenses that have drained the Board's emergency carryover funds, and prevented the Board from replacing lost key technical expertise required to conduct its public and worker health and safety oversight mission throughout the Department of Energy's (DOE) nuclear weapons complex. This budget request has been prepared to address the following issues that have a direct impact on the Board's ability to fulfil its statutory mission.

* \$17,000,000 appropriation; \$65,000 rescission.

Unfunded Pay Increases.

The following graph summarizes the Board's financial problem. While actual appropriations have remained essentially flat or have decreased in recent fiscal years, the salary and benefits account has been steadily rising due to non-discretionary Employment Cost Index (ECI)-based national pay schedule adjustments and locality pay increases. In effect, the Board has been forced to absorb approximately \$3,000,00 in pay adjustments since FY 1992. With a 4.94 percent pay adjustment in FY 2000 and a projected 3.7 percent adjustment for FY 2001, the funding situation becomes untenable without a substantial increase in new budget authority.



New GSA Rent Policy.

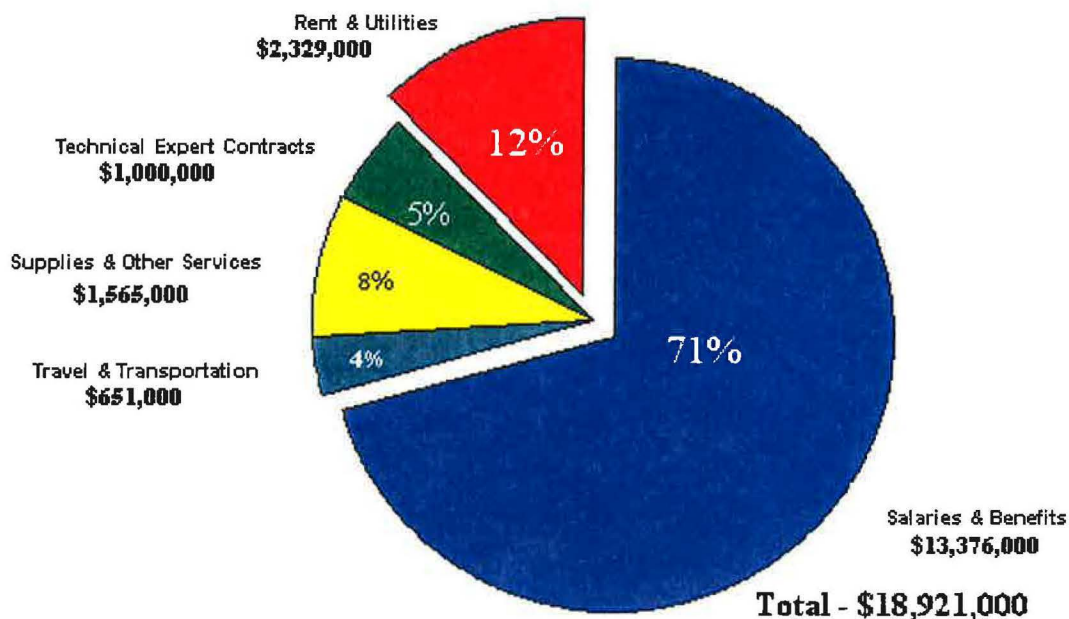
GSA has established a "New Pricing" policy designed to recover more expenses and GSA overhead from tenants. Based on the best information that the Board could obtain from GSA, the Board's projected rental payment for FY 2001 is \$2,187,000. This non-discretionary operating expense represents a 7 percent increase in rent above the \$2,044,000 the Board is paying for the identical office space in FY 2000.

Loss of Key Technical Personnel.

To offset the shortfall in funds caused by reduced appropriations and rising non-discretionary costs described above, the Board has not replaced all of the key technical staff who have left the Board due to attrition. As depicted in the following chart, the Board's budget is used primarily to pay the salaries and benefits of its employees, representing 71 percent of its

total projected obligations for FY 2001. Due to current funding constraints, the Board's staff has been reduced through attrition to 96 employees as of February 1, 2000, or 64 percent of the Board's statutory employment ceiling of 150 full-time staff.

Total Projected Obligations for FY 2001



Reduced Use of Outside Experts.

Where it is not economical or efficient to have permanent staff with expertise in a particular subject, the Board has relied on outside technical experts with unique experience or skills as outlined in Appendix C to perform specific reviews or studies. However, the Board has reduced its use of outside technical contractors by 40 percent, or approximately \$1,400,000 since FY 1995 due to the lack of sufficient funds. Consequently, some of these alternative sources of expertise are no longer available to the Board. The budget reflects a further reduction of \$1,000,000 in FY 2001.

A Growing Safety Oversight Mission.

DOE is committed to numerous new design and construction projects during the next decade to provide nuclear weapons stockpile support for the Nation's national defense and to resolve the remaining health and safety issues that are the historical legacy of weapons production. For example, tritium extraction for stockpile use, conduct of nuclear

experimentation, and preservation of the strategic pit inventory, will require the Board to oversee the operation of new defense nuclear activities. DOE's Office of Defense Programs also is developing a strategy that will change the balance and location of some defense nuclear work throughout the complex. As this strategy is implemented, some sites that have seen lesser amounts of nuclear work in recent years (such as the Lawrence Livermore National Laboratory and the Nevada Test Site) will significantly increase program activity.

While focusing much attention on existing defense nuclear facilities and operations, the Board also is required by statute to review design efforts, construction activities, and the initial operation of new defense nuclear facilities, and to make timely recommendations on any needed public health and safety improvements to the Secretary of Energy. Safely implementing the transfer of hazardous defense nuclear activities between sites—with the associated need to assure competent personnel, rigorous authorization basis control, and effective operational safety management—will continue to pose many challenges for DOE and its contractors, as well as associated oversight challenges for the Board. This significant projected increase in workload, described more fully in Section 1.3, will require the Board to augment its technical staff in the areas of design, safety analysis, and operations.

The “Bottom Line.”

The technical complexity and safety risks associated with the life cycle of this Nation's nuclear weapons, including the overall health and safety of the public, dictate a continuing need for strong Federal leadership and support. Safety oversight programs, such as this Board's, that directly impact the health and safety of the public have traditionally been given priority consideration even during periods of fiscal constraint due to the potential for significant loss of life, injury, or property damage if an accident should occur.

As clearly recognized by the Congress when establishing the Board, the ability to effectively carry out an independent, technical oversight program throughout the DOE weapons complex is heavily dependent on the technical capability of the Board Members and staff.

The conferees believe that the DNFSB is a unique Federal agency, in that its mission (is) to oversee the activities of another federal department whose work is highly technical and potentially dangerous, and that to properly carry out its mission, not only the DNFSB members but also its limited staff must be technically competent in all major phases of nuclear safety.¹

As explained in the preceding narrative, the Board's ability to perform its statutory mission has been severely hampered by the rapid growth in non-discretionary expenses, coupled with an increasing workload. To offset funding deficiencies, the Board has not replaced all key technical staff that have left, and currently is operating at 64 percent of its statutory employment ceiling. As a small agency, the Board has found it increasingly difficult to absorb these budget

¹ National Defense Authorization Act for Fiscal Year 1991, Conference Report, Title XXXII, October 23, 1990.

reductions and non-discretionary cost increases without directly impacting its technical staff safety oversight capability, and compromising its statutory mission.

For FY 2001, the Board must request additional budget authority to meet the projected payroll for its existing staff, which includes an expected 8 new hires during FY 2000 to offset losses from previous years. These staff are needed to fulfill the Board's public and worker health and safety oversight responsibilities directly related to DOE's nuclear weapons programs. The recruitment and retention of scientific and technical staff with outstanding qualifications have been and will continue to be critical to the successful accomplishment of the Board's mission.

Barring a change in current U.S. national security policy or an unforeseen incident affecting DOE defense nuclear programs, an FY 2001 appropriation of \$18,500,000 should be sufficient to offset actual and planned statutory pay adjustments affecting staff salaries and benefits, with no increase in personnel in FY 2001 and the 7 percent annual increases in the GSA bills for leased office space. This budget is the minimum needed for the Board to conduct adequately its statutorily mandated health and safety mission and maintain a small emergency fund to respond, if necessary, to a serious accident or other unexpected safety incident at a DOE defense nuclear facility.

1.1 SAFETY OVERSIGHT STRATEGY

The workload of the Board is prioritized to focus attention on the most hazardous DOE operations and complex-wide health and safety issues, consistent with the Board's enabling statute, safety oversight approach, and strategic plan. Specifically, the Board has concentrated its attention on the following sites, plants, facilities, and related activities:

- Pantex Plant (Texas) - Stewardship/maintenance of the nuclear weapons stockpile and dismantlement of nuclear weapons.
- Savannah River Site (South Carolina) - Vitrification of high-level wastes at the Defense Waste Processing Facility, the operation of Tritium Facilities in support of the active weapons stockpile, and stabilization of materials that are residuals from former production.
- Nevada Test Site - Stewardship/maintenance of the nuclear weapons stockpile, including subcritical experiments, and the capability to disposition damaged nuclear weapons.
- Oak Ridge Y-12 Plant (Tennessee) - Supporting safe stewardship/maintenance of nuclear weapons in the processing of highly enriched uranium, fabrication, assembly, and disassembly of nuclear weapons components and sub-assemblies, and storage of nuclear materials including uranium from disassembly of secondaries for nuclear weapons.

- Los Alamos National Laboratory (New Mexico), Lawrence Livermore National Laboratory (California), and Sandia National Laboratories (New Mexico and California) - Support for stockpile management and stewardship of the Nation's nuclear weapons, including research and enhanced surveillance of aging weapons.
- Hanford Site (Washington) - Preparations for remediation of 177 high-level radioactive waste tanks, stabilizing corroding highly radioactive fuel elements currently stored in the K-East and K-West nuclear fuel storage basins, and the stabilization of residuals of plutonium production at Hanford (e.g., at the Plutonium Finishing Plant).
- Rocky Flats Environmental Technology Site (Colorado) - Stabilization of residuals of plutonium production and lowering of contamination in numerous highly contaminated buildings.

Maintaining an effective safety oversight program that fulfills the broad mandates of the Board's enabling legislation (see Appendix A) requires a constant reassessment of health and safety conditions throughout the DOE defense nuclear complex. Sources of information used by the Board in making its assessments, evaluations, or recommendations to the Secretary of Energy are varied. They include testimony from public hearings and meetings, Congressional inquiries, site representative reports, staff issue papers, site visits, implementation plans for the Board's recommendations, responses to reporting requirements, and correspondence from workers and union representatives at the DOE sites. Based on the Board's assessment of the risks and the potential impacts to public or worker health and safety, priorities will change resulting in revised staff technical review assignments.

With ten years of operating experience, the Board has developed a strategy for maximizing the effectiveness of its resources by executing its safety oversight responsibility according to the following guiding principles:

- The primary responsibility for ensuring protection of the health and safety of the public and workers belongs with DOE line managers and extends in an unbroken chain from the Secretary of Energy to the workers on the floor.
- As an external "action-forcing" agency, the Board influences DOE line management actions to the extent needed to achieve improved safety objectives.
- Effective safety management demands that safety expectations be clearly defined and tailored to specific hazards at all levels—site, facility, or activity.
- Technical expertise is required to define and ensure compliance with controls commensurate with the identified hazards.
- Safety oversight activities are prioritized largely by risks to the public and the workers. Key indicators are the types and quantities of nuclear material at risk, and the process and setting of the operations involved.

- Safety oversight responsibilities for defense nuclear facilities will be accomplished in full cooperation with other agencies, such as individual states and the EPA for final cleanup, demolition, and environmental restoration activities, in compliance with responsibilities mandated by the Atomic Energy Act of 1954, as amended, and the federal environmental laws.

Various Executive Orders, including E.O. 12862, *Setting Customer Service Standards*, have stressed the need for Executive Branch agencies to be sensitive to the need for public involvement. The Board has used open public meetings and hearings, as well as its Internet Web Page located at www.dnfsb.gov, to increase public awareness and communication on Board activities. The Board has continued its practice of meeting with state and local officials, labor leaders, DOE facility workers, citizen advisory boards, public interest groups, and area residents to exchange information and inform interested parties of the Board's work.

Public meetings and hearings have been held by Board Members in the vicinity of DOE defense facilities at the Hanford Site, Savannah River Site, Oak Ridge Site, Rocky Flats Environmental Technology Site, Pantex Plant, Idaho National Engineering and Environmental Laboratory, Fernald Environmental Management Project/Mound Plant, Sandia/Los Alamos National Laboratories, and Lawrence Livermore National Laboratory. To date, a total of 33 public meetings have been held at or near DOE sites and 39 in Washington, D.C. The records of these meetings are made available to the public.

1.2 SAFETY OVERSIGHT IN PRACTICE

Selected examples of the Board's contributions to public and worker health and safety, resulting from the practical application of the above safety oversight principles, include enhancing lightning protection for the Pantex Plant, implementing Integrated Safety Management Systems at all the defense nuclear sites, verifying safety at the Waste Isolation Pilot Plant (WIPP), stabilization of legacy nuclear materials, and preventing the introduction of suspect/counterfeit items into safety-related and mission-sensitive applications. A summary of each example follows:

- **Lightning Protection for Nuclear Explosive Operations at Pantex.** The Board has a unique role in overseeing the safety of operations in the DOE nuclear weapons complex. It includes oversight of such vital national activities at the Pantex Plant as the assembly, disassembly, and surveillance of nuclear weapons. Threats to the safety of these activities are a major focus of the Board's reviews.

Following several reviews at Pantex, the Board concluded that the potential hazards from lightning to nuclear explosive operations had not been comprehensively and consistently addressed. In 1997, the Board requested that DOE prepare a comprehensive analysis of the hazards posed by lightning to nuclear explosive operations and the controls necessary to prevent and mitigate those hazards.

In response to this request, DOE and its contractor identified and installed a variety of protective measures to make nuclear explosive operations at Pantex less vulnerable to lightning-induced damage. These included electrical bonding of metallic penetrations, installing surge protectors on electrical lines entering bays and cells, certifying transportation carts that are effective in mitigating lightning hazards during movement of nuclear explosives, and establishing isolation requirements to prevent electrical energy from being inadvertently applied to explosive circuits. Taken together, these enhancements represent a significant improvement to the safety of nuclear explosive operations at Pantex. The Board is continuing to review this important issue, emphasizing the completion of facility modifications and the development and implementation of improved administrative controls.

- **Implementing Integrated Safety Management Systems.** Every Secretary of Energy with whom the Board has interacted since 1989 has stressed the importance of performing DOE's missions safely. However, with respect to defense nuclear facilities under the Board's oversight jurisdiction, the Board observed that DOE's programs for achieving this objective had been marked by (1) the uncoupling of work planning and safety planning; (2) the development of separate protective programs for the public, for workers, and for the environment; and (3) the use of separate programs for nuclear safety and for chemical safety (hazardous and toxic materials).

Given that the source of the hazards that all these programs are intended to address is frequently the same, addressing those hazards in an integrated way appeared to offer substantial benefit. Toward that end, the Board recommended in 1995 (Recommendation 95-2, *Safety Management*) a restructuring of DOE's safety management program to provide a more effective and integrated way for DOE to discharge its responsibilities for protecting the public, workers, and the environment.

Secretary of Energy Hazel O'Leary accepted the Board's Recommendation 95-2. Her successor, Secretary Peña, reaffirmed DOE's commitment to the Integrated Safety Management (ISM) concept and made implementation of the concept a requirement for all DOE's hazardous activities, nuclear and otherwise. In October 1998, Secretary Richardson reinforced these earlier initiatives and committed to having ISM fully implemented at all DOE facilities by September 2000.

The Board's work with DOE and its contractors has led to substantial progress in upgrading DOE directives, institutionalizing and implementing ISM at facilities in the complex, and establishing specific sets of safety control measures (authorization agreements) for work in facilities across the DOE complex. Currently, authorization agreements for 50 defense nuclear facilities have been approved.

- **Waste Isolation Pilot Plant.** The Board has been instrumental in expediting the safe startup and operation of the Waste Isolation Pilot Plant (WIPP), a geologic repository for the disposal of defense transuranic (TRU) nuclear wastes. The Board and its staff began reviewing the design and operational safety of WIPP in 1990, and stepped up these

activities in late 1998 as WIPP made final preparations to begin to receive wastes. In addition to reviewing WIPP's readiness to operate, the Board also evaluated DOE's waste characterization and certification audit process to ensure that wastes destined for WIPP would be appropriately characterized and packaged at the generating sites. Based on these reviews and evaluations, the Board concluded that WIPP could be operated safely, and reported this conclusion to the Secretary of Energy in a June 3, 1998 letter.

Opponents of WIPP had filed two lawsuits seeking to prevent or delay the receipt of wastes. At the request of DOE and the Department of Justice (DOJ), the Board prepared a declaration stating its conclusion on WIPP's safety posture and describing the bases for that conclusion. That declaration summarized the numerous reviews at WIPP by the Board and its staff dating back to 1990 and resulting conclusions on various technical issues such as underground room stability and TRU waste packaging and transporter safety. In addition, it described WIPP's recent conduct of successful operational readiness reviews and development of an Integrated Safety Management System in response to the Board's recommendations. Finally, and perhaps most significantly, the declaration emphasized the importance to national public health and safety of properly disposing at WIPP the quantities of TRU wastes, currently in temporary storage at the various defense nuclear sites across the nation. DOJ submitted the Board's declaration along with its pleadings for one of the suits and DOE subsequently received a favorable ruling in this suit. In addition, members of the Board's technical and legal staffs briefed the New Mexico Attorney General on safety matters within the Board's purview at WIPP, and the Board's position on these matters. The Attorney General subsequently withdrew as a party to the second suit, which the judge then decided in DOE's favor, removing the final legal and administrative roadblocks to WIPP startup.

- **Stabilization of Legacy Nuclear Materials.** During the era of active weapons production, plutonium and other weapon materials were in demand as feed materials, and plutonium-rich scrap from weapons fabrication processes was quickly recycled. This situation changed dramatically starting in 1989, as DOE began to shut down weapon production activities at many defense nuclear facilities. Substantial quantities of plutonium, uranium, and irradiated fuel remained in temporary storage not considered safe for long periods of time. To rectify this situation, the Board issued Recommendation 94-1 in May 1994, which recommended that these materials be treated on an accelerated basis to convert them to stable forms and then packaged for safe interim storage.

Significant risk reduction and material stabilization has been accomplished under the Recommendation 94-1 program. By the end of 1998, much of the plutonium solutions and residues, special isotopes, and irradiated fuel and targets had been stabilized. However, stabilization of plutonium metals and oxides, uranium solutions, and the Hanford Site's large inventory of spent nuclear fuel had not yet begun. Additionally, substantial quantities of americium, curium, and neptunium at the Savannah River Site remained to be stabilized. It was apparent that the plan for most of the remaining stabilization activities was outdated, and the Board accordingly requested DOE to develop a revised implementation plan. During the preparation of this revision, the

Board raised many questions as to the impact of proposed changes and the need for effective compensatory measures to ensure that unavoidable delays could be safely accommodated. Only after sustained, intensive interaction by the Board and its staff did the issues get addressed and resolved. A revised implementation plan for Recommendation 94-1 was issued by the Secretary of Energy in December 1998, providing plans and commitment dates for completing the remaining stabilization activities, an assessment of safety risks associated with delayed stabilization activities, and compensatory measures being taken to minimize the risk.

During the past year, the Board and its staff have been closely following and noting further slippage in the timetable for meeting the dates set forth in that revised plan. While much has been accomplished in meeting the safety objective reflected in Recommendation 94-1, particularly with regard to those materials that constitute the most imminent hazards, the Board remained concerned that severe problems continued to exist which delayed the implementation of this Recommendation. Consequently, on January 14, 2000, the Board issued Recommendation 2000-1 to address these problems.

- **Suspect/Counterfeit Parts.** In 1995, the Board's staff discovered a substantial deterioration in DOE's programs to prevent the introduction of suspect/counterfeit items into safety-related and mission-sensitive applications. The Board initiated several actions to correct the programmatic and operational deficiencies: the staff alerted the appropriate DOE internal auditing and oversight elements (the Inspector General and safety oversight office) and the several DOE program offices (Defense Programs; Environmental Management; Environment, Safety and Health). The staff also undertook initiatives to independently determine health and safety implications resulting from the introduction of suspect/counterfeit items into defense nuclear facilities and mission-sensitive applications. These efforts prompted the Under Secretary of Energy to form a Quality Assurance Working Group (QAWG) in order to restore DOE's quality assurance programs and DOE's ability to defend missions from suspect/counterfeit and non-conforming parts.

In 1996, Department of Defense (DOD) investigators notified DOE that a vendor of semiconductor devices for high-reliability applications supplied DOE with potentially nonconforming parts. DOE uses of the nonconforming parts included significant national security and mission-sensitive applications. Notwithstanding repeated assurances from the QAWG that a formal notification to DOE elements was imminent, DOE did not notify field elements until the Board brought the problem to the attention of the Under Secretary of Energy. DOE subsequently took effective actions to evaluate the adequacy of the parts and provide assurance that the potential nonconformances would not compromise safety.

In 1997 and 1999, DOD investigators again notified DOE that vendors had supplied DOE with nonconforming parts for national security or safety-related applications. Actions by the Board's staff were necessary to ensure that DOE took timely actions.

The Board continues to provide oversight and technical assistance to help control and assess the health and safety effects of possible introduction of suspect/counterfeit items into mission critical and safety-related applications. As a result of actions by the Board, the QAWG is formalizing practices and lessons learned to update and strengthen the DOE quality assurance program. The Board's oversight and timely intervention in dealing with suspect/counterfeit items were pivotal in energizing the reestablishment of DOE's quality assurance programs, vital to ensuring public health and safety at defense nuclear facilities.

1.3 FUTURE SAFETY OVERSIGHT CHALLENGES

The following examples discuss some of the upcoming challenges facing the Board in its safety oversight of the Department of Energy (DOE) that will require additional resources:

- DOE is committed to numerous new design and construction projects over the next decade to provide nuclear weapons stockpile support to this vital national security component and to resolve the remaining health and safety issues that are the historical legacy of weapons production. One example is the Tritium Extraction Facility at the Savannah River Site. The Board is required by statute to review design efforts, construction activities, and the initial operation of new defense nuclear facilities, and to make timely recommendations on any needed public health and safety improvements to the Secretary of Energy. This significant projected increase in workload in the design and construction area will require the Board to augment its technical staff in areas such as design, safety analysis, and operations.
- To maximize the efficient use of its resources in direct support of the nuclear weapons stockpile, DOE is developing a strategy that will change the balance and location of some defense nuclear work throughout the complex. As this strategy is implemented, some sites that have seen lesser amounts of nuclear work in recent years (such as the Lawrence Livermore National Laboratory and the Nevada Test Site) will be required to significantly increase tempo. Safely implementing the transfer of hazardous defense nuclear activities between sites—with the associated need to assure competent personnel, rigorous authorization basis control, and effective operational safety management—will represent many challenges for DOE and its contractors, as well as associated oversight challenges for the Board.
- The Board's oversight continues to identify technical issues that have the potential for significantly impacting the safety of nuclear weapon stockpile management activities. For example, at the Board's urging, DOE determined the real threat that lightning presents to nuclear weapons handling operations at the Pantex Plant, and is working to implement appropriate compensatory measures. DOE still must extend these lessons learned to the Nevada Test Site and other defense nuclear sites. This effort will require additional Board resources.

- DOE, in cooperation with the Department of Defense, is progressing toward defining the research, development, and manufacturing infrastructure that will be necessary to support the enduring stockpile in the absence of nuclear testing. For example, tritium extraction for stockpile use, conduct of nuclear experimentation, and preservation of the strategic pit inventory, will require the Board to oversee the operation of new defense nuclear activities throughout the next decade and beyond. In addition, DOE is ramping up its programs to extend the life of weapons in the enduring stockpile. These life extension programs will require more complex operations than the current dismantlement campaigns, since they involve disassembly as well as reassembly and recertification of large numbers of stockpile weapons. To effectively oversee these operations and, at the same time, strike the correct balance between national security requirements/schedules and safety management issues, the Board will need to substantially augment its technical staff with individuals who possess the necessary expertise.
- The Rocky Flats Environmental Technology Site will be the first large-scale defense nuclear site to face total deactivation. This site is currently scheduled to remove all nuclear materials by 2006. The Board will need to closely oversee the progress of Rocky Flats toward deactivation, since the experience gained there can provide a model for the considerable number of excess facilities in the DOE complex. The mission to conduct high-risk facility deactivation activities will continue across the DOE defense nuclear complex at an increasing rate in coming years. These activities involve hands-on, hazardous work requiring hazard evaluation, development of work controls and procedures, worker training, and conduct of operations. Increased Board attention and resources will be required to ensure that DOE safely conducts these high-risk activities.
- Since the end of the Cold War, maintenance of the technical competence (federal, laboratory, and contractor) essential to DOE's defense nuclear mission has been an increasingly difficult task. While the Board has always placed considerable emphasis on this vital safety management component, skilled employees continue to leave the workforce. Implementation of reorganization initiatives at DOE will require that close attention be paid to the preservation of appropriate technical skills, abilities, and experience. The Board will need additional resources to ensure that DOE maintains and develops required technical capabilities and that the new line management emphasizes safety in the conduct of its operations.
- In response to the Board's urging and guidance, DOE has made considerable progress developing programmatic direction for an integrated safety management approach to its hazardous nuclear activities; the Secretary of Energy has committed to complex-wide implementation by the beginning of FY 2001. However, observations indicate that extensive experience, feedback, and improvement will be required before effective implementation of integrated safety management and its associated cultural changes are fully realized across

the entire DOE weapons complex. The current rate of progress also may be challenged by the possible transition of several major contracts for defense nuclear site management, with the associated need to identify new sets of enforceable contractual health and safety requirements. The Board will need to increase its oversight efforts of the new contractors to ensure that the integrated safety management gains already achieved are continued.

- After considerable oversight and constructive engagement by the Board, the DOE is currently in a peak activity period for disposition of the hazardous remnants of the nuclear weapons production enterprise. The Waste Isolation Pilot Project is in operation, and the other defense sites are initiating new programs to qualify waste for acceptance and transport to that storage facility. In addition, real progress is being made to characterize, stabilize, and disposition high hazard nuclear materials, and several associated new facilities are either in design, construction, or initial operation. The Board's oversight efforts in this important risk reduction arena will need to be increased to keep pace with these new and inherently hazardous activities.

The Board's work in these anticipated new activities is essential to the fulfilment of its mission. The work is considered additional in the sense that the Board's resources are already fully committed to existing safety activities and this new work cannot be accommodated within the existing budget. The new work cannot be deferred or eliminated without severely impacting the Board's mission as required by Congress. The Board's continued work in these areas is assumed in its strategic planning. However, the Board believes that these new (additional) tasks substantially exceed the Board's current capabilities even after full consideration is given to reprioritizing its work. The Board will require additional and varied safety expertise to deal with the changing and expanding scope and nature of DOE's planned work.

1.4 CONCLUSION

In establishing the Board, Congress and the President intended that the Board assure and improve the safety of operations of DOE's defense nuclear facilities by providing independent, expert advice to the Secretary of Energy, identifying the nature and consequences of any significant potential threats to public health and safety, and elevating such issues to the highest levels of authority.

The positive impact of the Board's independent oversight on the DOE defense nuclear complex has become increasingly evident. During FY 1999, a number of DOE risk reduction actions and safety management upgrades resulting from Board initiatives, some initiated in previous years, were completed or advanced significantly.

The five Board Members, together with a small but extremely competent workforce, provide a cost-effective organizational arrangement for achieving the added safety assurance that the public seeks. Our budget request of \$18.5 million, to be used for staff salaries and required overhead expenses such as travel to the DOE weapons sites, provides the funding needed to support the Board's health and safety review actions planned for FY 2001.

A federal commitment of \$18.5 million to support the Board's oversight operations in FY 2001 is a wise investment in the improved safety and security of our Nation, and pales in comparison to the potential economic and health costs of a nuclear accident in a defense nuclear facility.

2. MISSION & STRATEGIC PLANNING GOALS SUMMARY

2.1 THE DOE DEFENSE NUCLEAR COMPLEX TODAY

Numerous 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 workers, the public, and the environment. 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 operator errors, equipment malfunctions, chemical reactions, fire, ignition of explosives, and inadvertent nuclear criticality events. If these hazards and their potential release mechanisms are not carefully addressed, the consequences of a resulting accident could include exposure to unacceptable radiation levels, uptake of radioactive materials, other serious compromise of the health and safety of the public and onsite workers, and unacceptable environmental impact.

The Board conducts its oversight of DOE so as to reduce the risks that exist in the defense nuclear complex to the greatest extent possible. Examples of those risks include:

- Hundreds of tons of fissionable material, in various forms, housed in 50-year-old buildings and structures.
- Thousands of nuclear weapons being dismantled, evaluated, or modified.
- Hundreds of tons of plutonium, including components from dismantled nuclear weapons.
- The nation's strategic inventory of tritium gas, including thousands of individual containers removed from nuclear weapons.
- Thousands of tons of deteriorating nuclear fuel in water-filled storage basins.
- More than one hundred million gallons of high-level radioactive waste awaiting treatment.

2.2 GENERAL GOALS

With its broad health and safety oversight mission as defined by statute, the Board has developed three general outcome goals that describe the intended result, effect, or consequence that will occur as a direct result of its oversight activities. Using its action-forcing powers, the Board seeks to effect the following outcomes:

- 1. Complex-Wide Health and Safety Issues.** Integrated safety management² (including comprehensive health and safety requirements, technically competent personnel, and effective implementing mechanisms) continues to evolve through feedback and improvement, and is implemented in all life cycle phases—design and construction, startup, operation, and decommissioning.
- 2. Safe Stewardship of Nuclear Weapons Stockpile and Components.** Nuclear weapons stockpile support and defense nuclear research activities continue to be planned and executed safely at DOE's defense nuclear facilities.
- 3. Safe Disposition of Hazardous Remnants of Weapons Production.** Hazardous remnants of nuclear weapons production are appropriately characterized, stabilized, and stored; and legacy facilities are decommissioned in a manner that protects the worker, the public, and the environment.

These outcome goals serve as the primary drivers for all Board health and safety oversight activities planned for FY 2000, FY 2001 and beyond. The Board focuses its actions on those activities and facilities that have reached a development stage that is best suited to constructive safety oversight, and on those operations where safety improvements have the greatest potential for risk reduction. The Board's independent oversight activities often reveal safety concerns that have not received attention by the DOE that is commensurate with the threat posed to the workers, the public, or the environment.

2.3 NATURE OF THE BOARD'S WORK

The mission of the Board is to oversee the safety of DOE's defense nuclear facilities with the objective of helping to protect the health and safety of the public and workers. The Board assists DOE in identifying health and safety problems at defense nuclear facilities so that they can be corrected, and then confirms that the resulting corrective actions are appropriately implemented. The Board stays closely attuned to the planning and execution of DOE's defense nuclear programs, gathering its information from a broad range of sources, including but not limited to:

- on-site technical evaluations by the Board and its staff,
- critical review of DOE safety analyses by competent technical experts,
- public meetings in the field and at the Board's headquarters, and

² Integrated safety management (ISM) is the means by which the Department of Energy is institutionalizing the process of incorporating into the planning and execution of every major defense nuclear activity those controls necessary to ensure that environment, safety and health objectives are achieved.

- daily input from the Board's Site Representatives assigned to the highest priority defense nuclear facilities.

The Board focuses primarily on defense nuclear facilities and activities at the following 13 defense nuclear complex sites across the United States:

- | | |
|---|---|
| ● Fernald Plant, Ohio | ● Nevada Test Site |
| ● Hanford Site, Washington State | ● Oak Ridge Reservation, Tennessee |
| ● Idaho National Engineering and Environmental Laboratory | ● Pantex Plant, Texas |
| ● Lawrence Livermore National Laboratory, California | ● Rocky Flats Environmental Technology Site, Colorado |
| ● Miamisburg Environmental Management Project, Ohio | ● Sandia National Laboratories, New Mexico and California |
| ● Los Alamos National Laboratory, New Mexico | ● Savannah River Site, South Carolina |
| | ● Waste Isolation Pilot Plant, New Mexico |

At these sites, the Board has identified 53 defense nuclear facilities that present the greatest health and safety risk. These facilities receive regular oversight attention and are the focus of a majority of the Board's technical resources; activities at lower-risk facilities receive less intensive oversight. The Board has deployed members of its technical staff as full-time Site Representatives at some of the high priority sites (currently at Hanford, Oak Ridge, Pantex, Rocky Flats, and Savannah River) to provide continuous on-site oversight. The Board also encourages DOE to implement fundamental safety upgrades that can have positive health and safety impacts throughout the defense nuclear complex.

The scheduling and conduct by the Board and its staff of its independent on-site technical evaluations, reviews, and observations frequently catalyze the DOE to begin identifying and correcting safety deficiencies. While, as noted above, the Board has optimized its resources by assigning Site Representatives to high priority defense nuclear sites, extensive travel by the Board and its Headquarters technical staff to defense nuclear facilities is still essential for the Board to accomplish its safety oversight mission.

So as to remain better informed on DOE's activities and initiatives, the Board also receives regular briefings by senior DOE officials. Information received by the Board in these briefings is used to understand how much progress is being made on safety matters and to gauge DOE's commitment to achieving real progress.

Based on the information gained, the Board chooses from the broad spectrum of action-forcing mechanisms granted to it by law to formally communicate identified concerns and promote appropriate DOE corrective action. These action-forcing mechanisms include Recommendations to the Secretary of Energy and to the President in the case of an imminent threat to public health and safety, requests for reports from the DOE, public meetings or hearings, technical exchanges and issuance of technical reports, investigations, and testimony to Congressional Committees. In addition, the Board often transmits issue reports prepared by the

Board's staff to the DOE, thereby sharing the staff's observations and findings. The Board has found that calling DOE's attention to the important findings in these reports is often sufficient to lead to responsive corrective action by DOE's management. The public may view these communications with DOE by accessing the Board's Internet Home Page at www.dnfsb.gov. After a safety concern is identified and communicated to DOE, the Board and its staff ensure that appropriate corrective actions are developed by DOE and its contractors, commitments are made to implement these corrective actions in a timely manner, and that these commitments are met.

Individual Board Members and the Board's staff may also engage in direct technical dialogue with the DOE and its contractors on specific safety concerns, and may participate in technical workshops and conferences where information relevant to safety improvement and risk reduction is exchanged. The Board has directed its senior staff members to meet frequently with their DOE counterparts to ensure that the staff is able to brief the Board on the status of safety issues and programs and on key safety questions, and that the DOE understands the Board's safety objectives and initiatives. This type of direct interaction conserves federal resources by ensuring that the DOE and the Board understand each other's positions in depth. This understanding, in turn, permits the Board to focus its Recommendations, letters, requests for information, and public meetings and hearings on the most important health and safety issues to be resolved. It averts the waste of resources of both the DOE and the Board on false starts and contention over easily resolved side-issues. In many cases, the simple exchange of ideas is sufficient to motivate the DOE to take appropriate actions without the Board's having to make formal Recommendations.

In addition to the wide scope of the Board's communications with DOE, the Board has exchanged information with other government agencies (e.g., Nuclear Regulatory Commission, the General Accounting Office, the Department of Defense, and the Environmental Protection Agency), as well as outside agencies (e.g., National Research Council and the National Academy for Public Administration). Such meetings serve to share knowledge, experiences, and factual information on matters of mutual interest with regard to the safety of the DOE defense nuclear facilities.

The Board remains committed to this policy of enhanced communication in the belief that in the end, safety is best served by spending federal dollars on real improvements at defense nuclear facilities, not on correspondence. Direct communication and discussions with the DOE in an open forum have proved to be powerful, cost-effective tools in advancing the Board's nuclear safety initiatives. The Board has held a total of 72 public meetings in both Headquarters and field locations, each of which involved substantive interchanges with senior DOE officials.

2.4 KEY EXTERNAL FACTORS AND PLANNING ASSUMPTIONS

The mission of the DOE defense nuclear complex has changed significantly since the Board's establishment, and will continue to evolve. The Board identifies and addresses fundamental and complex-wide safety management deficiencies, which are generally not

impacted by DOE's changing mission. The Board also focuses its safety oversight on technical issues associated with mission-specific operations, which change as DOE's mission shifts. A major accident or safety-significant event at a DOE facility involving special nuclear material would also dictate significant changes in priority and focus. In addition, the Board will continue to identify previously unrecognized safety concerns, which DOE will need to address. National security requirements may also change.

During each annual performance reporting period, it is anticipated that DOE's mission and associated schedules for major actions will continue to change. As these changes occur, the Board will redeploy its resources and modify some of its strategic and performance planning targets accordingly. The specified facility or activity on which a performance plan action is focused may change; however, the same (or an increased) level of performance and output should be achieved, in support of the general outcome goals.

The Board's Strategic Plan was prepared with the acknowledgment of this potential for rapid change in the complex under its oversight purview. To focus the plan to the greatest extent possible, the Board highlighted certain planning assumptions that underlie its current prioritization of activities.

- There is no major accident or safety-significant event at a DOE facility involving special nuclear material.
- There are no changes to DOE's schedule for major actions in the defense nuclear complex based on circumstances within or beyond its control, which would require a corresponding change in the Board's oversight plan.
- Current U.S. national security policy affecting DOE nuclear weapons stockpile stewardship and management remains unchanged.
- The Administration maintains its moratorium on the underground testing of nuclear weapons. Resumption of full-scale underground testing would require a major shift in the Board's resources for oversight.
- DOE's commitment and approach toward the stabilization of hazardous legacy materials and cleanup of contaminated defense nuclear facilities remain consistent with the current approach, as defined in the DOE Strategic Plan for FY 1997 - FY 2002.
- The Board's current statutory authority and responsibilities in the DOE defense nuclear complex remain unchanged.

3. ANNUAL PERFORMANCE PLANS FOR FY 2000 AND FY 2001

3.0 INTRODUCTION

The Board's original Strategic Plan, issued in 1997, proved to be effective in practice as a framework for managing technical efforts. However, the Board and its technical leadership found that the original plan's level of complexity dictated a degree of unique record-keeping for performance tracking that was unnecessarily burdensome for a small agency. The Board determined that a streamlined strategic and performance planning approach could retain the original intent and direction of the initial Strategic Plan, while reducing performance tracking requirements to a set that is more in keeping with the Board's small size and single program activity. As a result, in July 1999 the Board advanced the schedule for the periodic update of its Strategic Plan, as encouraged by the guidance provided by the Office of Management and Budget (OMB). The Performance Plan for FY 2000, as presented in this Budget Request, is structured in accordance with the Board's updated Strategic Plan.

As outlined in Section 2.2 of this Budget Request, the Board's statutory mission is logically divided along the lines established by the three general goals:

1. **Complex-Wide Health and Safety Issues.** Integrated safety management (including comprehensive health and safety requirements, technically competent personnel, and effective implementing mechanisms) continues to evolve through feedback and improvement, and is implemented in all life cycle phases—design and construction, startup, operation, and decommissioning.
2. **Safe Stewardship of Nuclear Weapons Stockpile and Components.** Nuclear weapons stockpile support and defense nuclear research activities continue to be planned and executed safely at DOE's defense nuclear facilities.
3. **Safe Disposition of Hazardous Remnants of Weapons Production.** Hazardous remnants of nuclear weapons production are appropriately characterized, stabilized, and stored; and legacy facilities are decommissioned in a manner that protects the worker, the public, and the environment.

The Board's Strategic Plan establishes the framework for making management decisions, and describes what the Board plans to do each year to progress toward achievement of each of these three general goals. In planning its work, the Board and its staff have developed a set of seven strategic objectives that, in aggregate, implement the Board's general goals. The relationship between these goals and objectives is discussed in the Board's Strategic Plan.

To facilitate strategic management, the Board has organized its technical staff into three technical groups. The technical lead of each group is assigned responsibility for one of the three general goals in the Strategic Plan, and for executing the strategic objectives associated with that goal. As required by the OMB guidance governing compliance with the Government Performance and Results Act, the Board and its technical leadership have produced measurable performance goals for FY 2000 and FY 2001 that, when executed, will demonstrate progress toward the Board's strategic objectives, and consequently toward its general goals. These annual performance goals and measures establish projected levels of performance and reflect the nature of the Board's independent oversight function.

All of the Board's general goals and strategic objectives 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 Plans for FY 2000 and FY 2001, in the pages that follow, identify an annual performance goal for each strategic objective that consists of a specific number of reviews to be conducted in support of that objective, plus the identification of candidate areas for these reviews. An outcome measure for each objective is described as part of the discussion of each annual performance goal. Each Annual Performance Report will provide a qualitative assessment of the outcome associated with each annual performance goal.

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.
- 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, worker, or environment.

The basis of measurement for the qualitative assessment will be formal correspondence of DOE and its defense nuclear contractors, Board correspondence, staff reports, DOE and contractor public testimony, and other sources. Past reporting experience, developed over the last nine years of reporting progress to Congress in the Board's Annual Reports, has shown that it should be possible to conduct a retrospective assessment of Board-identified issues and associated DOE responses to demonstrate that the Board has had a clear and positive impact on the safety culture within DOE.

Because of the variability of DOE's plans and schedules, some candidate areas identified in the Board's Annual Performance Plans 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 alternate candidate that was selected for review.

To facilitate an integrated review, the sections below are formatted to show the flow-through from strategic objectives to annual performance goals for FY 2000 and FY 2001. To place this planning information in context, the tables also provide examples of the Board's related FY 1999 accomplishments, as required by OMB's guidance on Performance Plans. These examples do not represent the entire scope of progress made on the FY 1999 performance goals—a comprehensive assessment will be provided in the Board's Annual Performance Report for FY 1999.

3.1 COMPLEX-WIDE HEALTH AND SAFETY ISSUES

3.1.1 Overview

The objectives and annual performance goals in support of the Board's first general goal address the agency's efforts to facilitate the complex-wide implementation of integrated safety management throughout the DOE defense nuclear complex. Achievement of this goal will require a multi-year, multi-site, multi-focus effort by the Board during each annual performance period. The Board's three strategic objectives that support Goal 1 encompass a broad spectrum of technical areas relevant to the safety of DOE's defense nuclear mission.

The elements of the integrated safety management approach include (1) a strong foundation of comprehensive health and safety requirements and guidance promulgated through DOE's directive system, (2) assurance that federal and contractor personnel have the technical competence necessary to execute their responsibilities, and (3) development and implementation of effective safety management mechanisms throughout all portions of a facility's life cycle. The Board focuses attention on DOE's progress in all of these complex-wide areas, seeking to identify additional means by which full and effective implementation of integrated safety management can be expedited.

The Board's Strategic Plan identifies three specific objectives that it intends to pursue to ensure that DOE performs its defense nuclear mission safely. They are:

- 1-A: Improvement and Integration of Health and Safety Directives.** The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.
- 1-B: Technical Competence.** The Board and its staff will verify that the 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.
- 1-C: Complex-Wide Implementation of Integrated Safety Management.** The Board and its staff will verify the effective and expeditious development and implementation of DOE's integrated safety management in facility design and construction, operation, and post-operation.

The Board believes that specific actions currently planned for FY 2000 and FY 2001 to advance each of these objectives are possible and desirable. These actions, which are specified in the following tables, build on the Board's activities and accomplishments of past years in technically rigorous oversight and constructive interaction with the DOE. Examples of related FY 1999 performance accomplishments that have supported the Board's objectives are also provided in the following tables. All such activities and accomplishments have been publicly identified in documents such as the Board's Annual Reports, letters, technical reports, and

previous budget requests. The Board's actions described in the following tables are also based on its assessment of progress expected in FY 2000 and on major DOE efforts planned during FY 2001, which in turn are predicated on many factors, most importantly, the DOE budget and its accomplishments during this period.

3.1.2 Adjustments to the FY 2000 Performance Goals

The Board's FY 1999 Performance Plan preliminarily identified 12 specific FY 2000 annual performance goals in support of this General Goal and its associated objectives. This modified FY 2000 Performance Plan, written in accordance with the structure of the Board's updated Strategic Plan, captures all of the areas of focus previously identified for FY 2000 within three broader-scope annual performance goals that have, collectively, 17 primary reviews.

The primary external factors that may drive mid-year modifications to the annual performance goals outlined in the following tables are of three types:

- Changes in functional area focus for DOE's directives upgrade program;
- Delays in the schedules for design and construction projects; and
- Slower progress than committed to by the DOE in the implementation of integrated safety management systems.

COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Objective 1-A: Improvement and Integration of Health and Safety Directives. The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.

Examples of FY 1999 Accomplishments	FY 2000 Performance Goals	FY 2001 Performance Goals
<p>The Board and its staff provided substantive comments to DOE during the review process for three health and safety directives associated with deactivation and decommissioning. After successfully resolving the Board's comments, DOE updated one of these directives. At years end, both staffs were completing resolution of issues in the two remaining directives to improve content, clarity, and consistency of the guidance.</p> <p>The Board's staff provided comments on thirteen draft implementation guides associated with 10 CFR 835, <i>Occupational Radiation Protection</i>, DOE-STD-1098-99, <i>Radiological Control Standard</i>, and two handbooks associated with the DOE radiological protection program. The staff then worked with the DOE staff to resolve the identified areas of needed improvement. By year's end, DOE had issued all thirteen implementation guides and both handbooks, and had sent the standard to the DOE Technical Standards Program for publication. These actions resulted in clarifying and strengthening DOE's guidance for this important safety management function.</p> <p>The Board provided comments to DOE on a new guide on management of Quality Assurance, a new qualification standard for individuals engaged in criticality safety studies, and a new handbook addressing design considerations, all three of which are explicitly associated with integrated safety management. Through significant interaction between the Board's staff and their DOE counterparts, significant improvements in the content and clarity of the directives were achieved.</p>	<p>The Board and its staff will review and assess the adequacy of health and safety requirements in new directives and rules, as well as in specific DOE directives that may be revised as a result of DOE's two-year review cycle. Results are communicated to DOE by the Board or its staff for incorporation or resolution, as appropriate.</p> <p>It is estimated that DOE will issue a minimum of 40 directives for review by the Board and its staff in FY 2000. Based on experience from FY 1999, it is expected that approximately 3 of these reviews will be of major significance, and, as such, will require substantial Board and staff interaction with DOE to satisfactorily resolve identified issues prior to finalization.</p> <p>The Board will place particular emphasis on encouraging DOE to develop necessary new directives and to improve, consolidate, and integrate existing directives and rules related to health and safety in the following areas:</p> <ul style="list-style-type: none">• Integrated safety management, including requirements selection, feedback and improvement, and performance measures,• Project management and systems engineering throughout the full facility life cycle, and• Hazard Analysis Reports for nuclear explosive operations. <p>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.</p>	<p>The Board and its staff will review and assess the adequacy of health and safety requirements in new directives and rules, as well as in specific DOE directives that may be revised as a result of DOE's two-year review cycle. Results are communicated to DOE by the Board or its staff for incorporation or resolution, as appropriate.</p> <p>It is estimated that DOE will issue a minimum of 40 directives for review by the Board and its staff in FY 2001. Based on experience from FY 1999, it is expected that approximately 3 of these reviews will be of major significance, and, as such, will require substantial Board and staff interaction with DOE to satisfactorily resolve identified issues prior to finalization.</p> <p>The Board will place particular emphasis on encouraging DOE to develop necessary new directives and to improve, consolidate, and integrate existing directives and rules related to health and safety in the following areas:</p> <ul style="list-style-type: none">• Effective conduct of hazardous facility, site and complex-wide projects and programs, including roles, responsibilities, competencies, mechanisms, and training, and• Additional adequate performance measures for determining effectiveness of site integrated safety management programs. <p>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.</p>

COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Objective 1-B: Technical Competence. The Board and its staff 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.		
Examples of FY 1999 Accomplishments	FY 2000 Performance Goals	FY 2001 Performance Goals
<p>The Board continued to focus DOE's attention on the technical competence of federal workers as an essential safety element for defense nuclear facilities. Through a revised Implementation Plan for Board Recommendation 93-3, <i>Improving DOE Technical Capability in Defense Nuclear Facilities Programs</i>, DOE formed a panel of senior line managers to ensure successful implementation of a corporate program to recruit, develop, deploy, and retain technical capability at defense nuclear facilities. The panel members self-assessed the Technical Qualification Programs at their respective sites, and took the necessary actions to upgrade their plans and procedures. The panel also identified 686 critical technical positions and took administrative actions to preserve nearly all of these positions against any future downsizing.</p> <p>Significant accomplishments were made by DOE as a result of implementing Board Recommendation 97-2, <i>Criticality Safety</i>. Training and qualification programs for both DOE and contractor criticality engineers were established including high quality qualification standards. The operation of the Los Alamos National Laboratory critical facility was revamped for training of criticality safety engineers and for the development of intermediate range neutron energy data for critical assemblies. These activities provide vital information for understanding and characterizing the unique hazards and for developing proper safety controls related to nuclear criticality. Additionally, a web-site was developed for dissemination of archived data on the past 40 years of criticality experiments which will provide great benefit to the nuclear safety community.</p>	<p>The Board and staff will complete 8 assessments of DOE's efforts to:</p> <ul style="list-style-type: none">• Define roles and responsibilities assignments for safety management in Headquarters and the Field, including appropriate consideration of the associated FRAMs, for three DOE organizations (one Headquarters and two Field),• Periodically assess the effectiveness of the Federal Technical Capabilities Program for DOE employees,• Assure that competence is commensurate with assigned responsibilities for key safety management personnel in the field, including qualifications to perform criticality safety oversight, for two DOE Field Offices and two defense nuclear contractor organizations. <p>Results of assessments will be communicated to DOE to enhance understanding of safety-related roles and responsibilities in support of DOE's execution of functions associated with protecting the worker and the public, and to be used by DOE to upgrade the quality of its technical workforce.</p>	<p>The Board and staff will conduct the following 5 assessments:</p> <ul style="list-style-type: none">• Review the status of implementation and institutionalization of the Federal Technical Capability Program ,• Assess whether competence is commensurate with assigned responsibilities for key safety management personnel at two defense nuclear contractor organizations as part of scheduled DOE and contractor readiness determinations, and• Evaluate DOE's 5-year plan to assure the continuation of a viable criticality safety program beyond the completion of programs uniquely identified in Recommendation 97-2 through reviews at two DOE sites. <p>Results of assessments will be communicated to DOE to enhance understanding of safety-related roles and responsibilities in support of DOE's execution of functions associated with protecting the worker and the public, and to be used by DOE to upgrade the quality of its technical workforce.</p>

COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Objective 1-C: Complex-Wide Implementation of Integrated Safety Management in Facility Design, Operation, and Post-Operation. The Board and its staff will verify the effective and expeditious development and implementation of DOE's integrated safety management (ISM) program.

Examples of FY 1999 Accomplishments	FY 2000 Performance Goals	FY 2001 Performance Goals	FY 2000/FY2001 Performance Measures
<p>Reviews by the Board and its staff identified shortcomings in the Hanford Spent Nuclear Fuel Project that included the continued lack of sound project management, despite several high level management changes; poor implementation of quality assurance requirements; and an inability to identify and resolve emerging technical issues in a timely manner. Continued Board and staff pressure through correspondence and face-to-face meetings has led to some progress on these concerns, but continuing attention is needed.</p> <p>Several key indicators for gauging progress in implementing ISM have been identified from the Board's reviews: Incorporation of ISM-related DEAR clauses into contracts, establishment of a mutually agreed-upon requirements base as the foundation for the ISM program, development of an ISM System description that describes how the contractor will integrate the system into work practices, performance of a DOE ISM verification review, and establishment of an authorization agreement. Each of these areas received Board attention in FY1999, not only at the 10 priority facilities called out in the Recommendation 95-2 DOE Implementation Plan but also in the 43 facilities designated in the Board's December 1997 letter as "follow-on" facilities. During the FY1999, DOE has worked to fully implement ISM at the Recommendation 95-2 priority facilities. The Board monitored and advised on the development of DEAR Clause-required ISM descriptions, which describe how the contractor will integrate ISM into work practices. To date, all sites with priority or follow-on facilities have had their ISM descriptions approved by DOE, except Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and the Pantex Plant, which are scheduled for approval by the end of the year. The Board also urged DOE to continue its efforts to define and operate to explicit control measures at the priority facilities, and enlarge its efforts to include all high and moderate hazard defense nuclear facilities. In his March 1999, memorandum on Safety-Accountability and Performance, the Secretary of Energy committed to having ISM completely in place for all DOE facilities by September 2000.</p> <p>In response to the Board's March 20, 1998, reporting requirement on the DOE's Feedback and Improvement program, the Department committed to upgrading the DOE Lessons Learned process, including developing guidance on improving the complex-wide feedback and improvement programs. In addition, DOE recently published a revised DOE acquisition regulations that will hold a contractor's fee at risk in the event of poor safety performance. The Secretary of Energy's March 3, 1999, memorandum on Safety-Accountability and Performance tasked the newly established DOE Safety Council with developing performance standards that will be used to hold Federal personnel accountable for effective and timely ISM implementation. The Board is continuing to work closely with the DOE in this effort.</p> <p>The Board issued Recommendation 98-1 to address the internal independent oversight element of the feedback and improvement program that the Board felt was not being adequately addressed in the Departments feedback and improvement initiatives. The Board determined that DOE Headquarter's independent assessments of safety management of the field were treated largely as advisories and follow-up actions were became discretionary to lower levels of DOE line management. DOE accepted this Recommendation and provided an acceptable Implementation Plan, which addresses the Department's need for a clearly defined, systematic, and comprehensive process to address and resolve safety issues identified by internal independent oversight.</p>		<p>The Board and its staff will conduct at least 6 reviews of DOE's efforts to implement ISM throughout all facility life cycle phases. To support DOE's strategic objective to implement ISM complex-wide by the end of FY 2000, the Board will improves its communication effectiveness by consistently characterizing technical review results using standard ISM terminology. Candidates for review include:</p> <ul style="list-style-type: none"> • Tritium Extraction Facility to be built at the Savannah River Site. These will include reviews of detailed process hazards studies, the quality assurance program for procurement of process equipment, the quality assurance program for construction, and a detailed structural review of the facility design prior to initiation of construction. • Other DOE design/construction activities, including technical project management, criteria development, design preparation, and construction. Selection for review will be based on relative hazards, and on DOE's schedule and progress on candidate facilities. • Hanford Spent Nuclear Fuel project, including reviews of hazards studies and Safety Analysis Reports, construction, equipment operational testing, procedures, and operator training in preparation for the start of fuel removal from the K-Basins in November 2000. • DOE's verification reviews of institutional-level ISM System implementation for those sites with facilities that were identified as top priority in DOE's Implementation Plan for Board Recommendation 95-2. • At least one of DOE's ISM System verification reviews conducted for a defense nuclear site identified as the next level of priority (e.g., Sandia National Laboratories, the Nevada Test Site, or Idaho National Engineering and Environmental Laboratory). • Authorization Agreements for Pantex Plant weapons activities, as well as selected Authorization Agreements for other defense nuclear facilities and activities. <p>As a result of these reviews, DOE wil provide an adequate approach and schedule for resolution of identified issues that supports safe start-up and operation of new or modified defense nuclear facilities.</p>	<p>The Board and its staff will conduct at least 5 reviews of DOE's efforts to implement ISM throughout all facility life cycle phases. Candidates for review include:</p> <ul style="list-style-type: none"> • Tritium Extraction Facility at the Savannah River Site, including monitoring the start of construction activities. • Final preparations for the start of fuel removal from the Hanford Site's K-Basins will be reviewed by the Board and its staff, including monitoring the drying of the fuel and the sealing of the storage containers. • DOE's implementation of performance indicators that can provide accurate measurement of ISM implementation and performance, including review of applicable documents and contracts for evidence of performance measures linked to mechanisms for providing feedback information. • New design and construction projects, for the institutionalization of sound systems engineering practices to ensure that suitable processes are in place and functioning to utilize DOE's limited resources in a cost-effective manner without compromising the protection of workers, the public and the environment. <p>As a result of these reviews, DOE will provide an adequate approach and schedule for resolution of identified issues that supports safe start-up and operation of new or modified defense nuclear facilities.</p> <p>Also, the implementation of ISM performance indicators will provide an accurate measure of the effectiveness of the site and facility ISM programs.</p>

3.2 SAFE STEWARDSHIP OF NUCLEAR WEAPONS STOCKPILE AND COMPONENTS

3.2.1 Overview

The objectives and annual performance goals in support of the Board's second general goal address the Board's efforts to support DOE's safe execution of its national security mission. Achievement of this goal will require the Board and its staff to evaluate DOE's work at multiple sites in direct support of the nuclear weapons stockpile, as well as associated research and development. Many of DOE's programs in this area do not yet have detailed schedules and milestones and will likely span multiple years. Correspondingly, the Board's oversight efforts will also be multi-year. The Board's two strategic objectives that support Goal 2 address the safe execution of various activities within DOE's two primary nuclear weapon mission components, direct support of the stockpile and nuclear weapon research and development activities.

Nuclear weapons continue to play an integral role in U.S. national security policy. By their nature, the operations to maintain a nuclear weapons stockpile involve hazards that, if not adequately controlled, could pose unacceptable consequences to the public and the workers. Therefore, DOE must ensure that the unique hazards associated with nuclear weapons and components are adequately controlled in a tailored, integrated safety management system. The Board will maintain safety oversight of DOE's nuclear weapons operations in fulfillment of national security objectives.

The Board's Strategic Plan identifies two specific objectives to improve the safety of operations involving DOE's nuclear weapons and nuclear weapon components:

- 2-A: Safe Conduct of Stockpile Management.** The Board and its staff will verify the safety of DOE's defense nuclear facilities and activities relating to the maintenance, storage, and dismantlement of the nuclear weapon stockpile.
- 2-B: Safe Conduct of Stockpile Stewardship.** The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.

The Board believes that specific actions currently planned for FY 2000 and FY 2001 to advance each of these objectives are possible and desirable. These actions, which are specified in the following tables, build on the Board's activities and accomplishments of past years in technically rigorous oversight and constructive interaction with the DOE. Examples of related FY 1999 performance accomplishments that have supported the Board's objectives are also provided in the following tables. All such activities and accomplishments have been publicly identified in documents such as the Board's Annual Reports, letters, technical reports, and previous budget requests. The Board's actions described in the following tables are also based on its assessment of progress expected in FY 2000 and on major DOE efforts planned during FY

2001, which in turn are predicated on many factors, most importantly, the DOE budget and its accomplishments during this period.

3.2.2 Adjustments to the FY 2000 Performance Goals

The Board's FY 1999 Performance Plan preliminarily identified 15 specific FY 2000 annual performance goals in support of this General Goal and its associated objectives. This modified FY 2000 Performance Plan, written in accordance with the structure of the Board's updated Strategic Plan, captures all of the performance goal targets previously identified for FY 2000 within two broader-scope annual performance goals that have, collectively, 24 primary reviews.

The major external factor that may drive mid-year modifications to the annual performance goals outlined in the following tables relates to potential slips in DOE's schedule for stockpile support or research activities.

SAFE STEWARDSHIP OF THE NATION'S NUCLEAR WEAPONS STOCKPILE AND COMPONENTS

Objective 2-A:	Safe Conduct of Stockpile Management. The Board and its staff will verify the safety of DOE's defense nuclear facilities and activities relating to the maintenance, storage, and dismantlement of the nuclear weapon stockpile.		
Examples of FY 1999 Accomplishments		FY 2000 Performance Goals	FY 2001 Performance Goals
<p>DOE Standard on Hazards Analysis Reports: In early 1999, in response to a Board Recommendation, DOE developed and published a standard on conducting and documenting hazards analyses for nuclear explosive operations. This important directive sets DOE's fundamental expectations and provides guidance on how to establish and document the safety basis that ensures hazardous activities involving nuclear explosives can be completed safely</p> <p>Lightning Protection at Pantex The Board and its staff continued efforts over the last year to help DOE address the potential hazards from lightning to nuclear explosive operations at Pantex. This year, the DOE lightning protection project team (which was established in response to a Board reporting requirement) completed a comprehensive investigation and report detailing the threat of lighting to nuclear explosives, analyzing potential controls and mitigators, and summarizing the actions DOE considers necessary to protect nuclear explosive operations at Pantex from lightning threats. During this same time, DOE has identified and installed many additional lighting protective measures at the plant</p> <p>Chemical Safety: Based on evaluations from its staff, the Board concluded that efforts to improve chemical safety at the Oak Ridge Y-12 Plant were not keeping pace with other defense nuclear sites or the Secretary of Energy's published expectations. After the Board communicated its concern, DOE has stepped up efforts to complete a chemical management program at Oak Ridge Y-12, including a renewed commitment to characterize chemical inventories for emergency planning purposes and to dispose of excess chemicals.</p> <p>Safety Controls for Specific Nuclear Explosive Operations: The Board and its staff conducted numerous assessments of the safety of specific nuclear explosive activities at the Pantex Plant in the last year. These reviews, which included the W56 dismantlement, the W87 Life Extension Program, and the W62 surveillance program, identified safety-related issues such as the adequacy of safety analyses and controls, the flowdown of controls into operating-level procedures, and the readiness of activities to operate safely. As a result of the Board's involvement, DOE has taken positive action to improve the safety of all of these operations.</p> <p>Integrated Safety Management at Pantex: In early FY1999, the Board issued Recommendation 98-2, <i>Integrated Safety Management at the Pantex Plant</i> urging DOE to take fundamental actions to improve the safety of all weapons-related work at the Pantex Plant. Principle among the Board's specific recommendations was that DOE simplify and expedite its process for re-engineering processes at Pantex such that the attendant safety improvements could be put in place sooner. DOE accepted Recommendation 98-2 and made specific commitments to improve safety management at Pantex including accelerating efforts to establish weapon-specific safety basis for all on-going activities at Pantex.</p> <p>Enriched Uranium Restart at Y-12: The Board and its staff have been evaluating DOE efforts to resume enriched uranium operations at the Oak Ridge Y-12 Plant for several years. In the last year, the Board has identified and passed on to DOE several safety issues with the Phase A2 resumption project including design problems, safety analysis problems, and problems with implementation of safety controls. The Board and DOE worked cooperatively to resolve these issues such that Phase A2 operations could resume safely to support high priority national defense related missions.</p>		<p>The Board and staff will complete 16 assessments of DOE's efforts to develop and implement safety management systems for stockpile management activities. The Board's evaluations will be split roughly evenly 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, Oak Ridge Y-12 Plant, and Savannah River Site tritium activities.</p> <p>Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none">• Weapon Safety Specifications and/or Hazard Analysis Reports for nuclear weapon activities, particularly the W62, W88 and W76• Safety basis analysis and change control for nuclear weapons activities or facilities• Cross-cutting functional areas at the Pantex Plant, Oak Ridge Y-12 Plant, or SRS tritium facilities• DOE/contractor operational readiness reviews or other readiness determinations particularly Phase B restart activities at Y-12 Plant Enriched Uranium Operations• Special studies of unique or significant hazards at a DOE weapons facilities <p>In addition, the Board and staff will assess the adequacy of development and implementation of the ISM System and the safety controls identified for any new weapon system dismantlement projects at the Pantex Plant or the Oak Ridge Y-12 Plant (such as the W56) that start in FY 2000.</p>	<p>The Board and staff will complete 13 assessments of DOE's efforts to develop and implement safety management systems for stockpile management activities. The Board's evaluations will be split roughly evenly 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, Oak Ridge Y-12 Plant, and Savannah River Site tritium activities.</p> <p>Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none">• Weapon Safety Specifications and/or Hazard Analysis Reports for nuclear weapon activities• Safety basis analysis and change control for nuclear weapons activities or facilities• Cross-cutting functional areas at the Pantex Plant, Oak Ridge Y-12 Plant, or SRS tritium facilities• DOE/contractor operational readiness reviews or other readiness determinations• Special studies of unique or significant hazards at a DOE weapons facilities <p>In addition, the Board and staff will assess the adequacy of development and implementation of the ISM System and the safety controls identified for any new weapon system dismantlement projects (such as the B53) at the Pantex Plant or Oak Ridge Y-12 that start in FY 2001.</p>

SAFE STEWARDSHIP OF THE NATION'S NUCLEAR WEAPONS STOCKPILE AND COMPONENTS

Objective 2-B:	Safe Conduct of Stockpile Stewardship. The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.		
Examples of FY 1999 Accomplishments		FY 2000 Performance Goals	FY 2001 Performance Goals
<p>B332 Restart: After a Board letter in December 1997 identifying weaknesses in work planning, authorization and control in Building 332, Plutonium Facility, the Board interacted with Lawrence Livermore National Laboratory and the Department of Energy throughout Building 332's Resumption of Operations in 1998 and 1999 to encourage and assist with the improvements. As a result, Building 332 has implemented a process to plan, authorize and control work with special nuclear material safety. With the Board's encouragement the process has been applied to the other facilities in the Superblock, i.e., Tritium Facility and Hardened Engineering Test Building. The Laboratory is revising site implementing guidance on planning, authorizing and control work to address a laboratory-wide systemic problem.</p> <p>Integrated Safety Management at LLNL: As a result of the Board's effort to improve safety management at DOE defense nuclear facilities (Recommendation 95-2), LLNL has developed a set of Work Smart Standards (a set of requirements and standards for hazards specifically applicable to LLNL), is making significant progress with developing a description of its integrated safety management system, and is developing site-wide standards/guidance to implement an integrated safety management system. Through direct Board interaction, Board letters, and Board staff visits and reviews, the Board has provided assistance with and feedback to the Work Smart Standards set and to the Laboratory's efforts to develop policy and guidance to implement integrated safety management.</p> <p>Y2K: Based on staff reviews at Lawrence Livermore National Laboratory and other sites, the Board determined the DOE had provided inadequate direction to the operators of its defense nuclear facilities with regard to evaluating safety-related systems for year 2000 compliance. The Board communicated its concern to DOE in a letter requesting that DOE report on the status of safety-related equipment evaluations at all defense nuclear facilities. In April 1999, DOE issued detailed guidance on the evaluation of safety-related systems, requiring those systems be treated in a manner similar to mission-essential systems.</p> <p>Los Alamos National Laboratory Pajarito Laboratory: The Board and its staff identified deficiencies with the safety basis for activities conducted at the Pajarito Laboratory (also known as TA-18 which includes the Los Alamos Critical Experiments Facility). The Board assisted DOE and the lab in defining a path to improve the safety basis including urging that DOE focus on Basis for Interim Operations to upgrade the safety controls at Pajarito Laboratory as soon as possible.</p> <p>Damaged Nuclear Weapons: The Board has recently focused attention on the issue that DOE's capability to safely perform the work necessary to dispose of damaged nuclear devices (DNDs) at defense nuclear facilities is rapidly disappearing. In the past, maintenance of the facilities and personnel necessary to support this mission depended on nuclear test operations. However, the personnel and facility infrastructure that were required to support testing operations are rapidly disappearing. Planning DND operations so that they can be executed safely represents challenges that DOE is not addressing. Nuclear Weapons. DOE has agreed with the Board's conclusions and is starting to increase its efforts to address this issue.</p>		<p>The Board and staff will complete 8 assessments of DOE's efforts to develop and implement safety management systems for stockpile stewardship activities. The Board will evaluate DOE's 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. The Board's efforts in this area will also cover DOE's efforts to address safety issues of aging-related changes in nuclear weapons components, including research and modeling, for weapon systems and components in the enduring stockpile. These reviews will focus on activities at Lawrence Livermore National Laboratory, Los Alamos National Laboratory, the Nevada Test Site, and Sandia National Laboratories.</p> <p>Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none">• The safety basis analysis and change control for nuclear weapons activities or facilities particularly resumption of DOE-DP related work at the Sandia Annular Core Research Reactor• safety controls selected for hazardous weapons complex activities• cross-cutting functional areas at LANL, LLNL, NTS and SNL• ISM work-planning process (i.e., activity-specific hazard analysis, controls identification, and implementation of safety controls)• DOE/contractor operational readiness reviews or other readiness determinations• aging-related changes in nuclear weapons components for weapon systems in the enduring stockpile	<p>The Board and staff will complete 6 assessments of DOE's efforts to develop and implement safety management systems for stockpile stewardship activities. The Board will evaluate DOE's 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. The Board's efforts in this area will also cover DOE's efforts to address safety issues of aging-related changes in nuclear weapons components, including research and modeling, for weapon systems and components in the enduring stockpile. These reviews will focus on activities at Lawrence Livermore National Laboratory, Los Alamos National Laboratory, the Nevada Test Site, and Sandia National Laboratories.</p> <p>Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none">• The safety basis analysis and change control for nuclear weapons activities or facilities• safety controls selected for hazardous weapons complex activities• cross-cutting functional areas at LANL, LLNL, NTS and SNL• ISM work-planning process (i.e., activity-specific hazard analysis, controls identification, and implementation of safety controls)• DOE/contractor operational readiness reviews or other readiness determinations• aging-related changes in nuclear weapons components for weapon systems in the enduring stockpile

3.3 SAFE DISPOSITION OF HAZARDOUS REMNANTS OF WEAPONS PRODUCTION

3.3.1 Overview

The objectives and annual performance goals in support of the Board's third general goal address the Board's efforts to confirm the safe disposition of hazardous nuclear weapons legacy materials and facilities. Achievement of this goal will require a multi-year, multi-focus, multi-site effort by the Board during each annual performance period. The Board's oversight efforts in support of this goal are organized, in general, according to the hazardous nuclear material of focus. The Board's two strategic objectives that support this goal address DOE's efforts to reduce the risks of legacy materials by appropriate processing and disposition, as well as efforts to decommission production facilities and sites no longer essential to the national security mission.

More than fifty years of nuclear weapons production has resulted in a hazardous collection of surplus, legacy materials consisting of radioactive and chemically reactive metals, residues, spent fuel, and wastes throughout the DOE complex. These include approximately 100 million gallons of highly radioactive wastes; unprocessed plutonium, enriched uranium, and other actinides; thousands of drums of plutonium- and uranium-bearing residues awaiting processing; and more than 2000 tons of degraded irradiated uranium fuel awaiting stabilization. Left unremediated, these materials represent a significant threat to the health and safety of facility workers and the public, as well as to the environment. It is the Board's intention to ensure that DOE places a high priority on reducing the risks that these high hazard materials pose and monitoring the operations and activities involved in cleanup of defense nuclear facilities. Through its oversight of DOE defense nuclear facilities, the Board seeks to confirm that DOE's stabilization and decommissioning programs are performed safely and completed without undue delay.

The Board's Strategic Plan identifies two specific objectives that the Board believes should be pursued to ensure and improve the safe cleanup of DOE's defense nuclear facilities:

- 3-A: Material Stabilization.** The Board and its staff will verify that DOE properly and safely characterizes, stabilizes, processes, and stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal of these materials, as needed.
- 3-B: Facility Decommissioning.** The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.

The Board believes that specific actions currently planned for FY 2000 and FY 2001 to advance each of these objectives are possible and desirable. These actions, which are specified in the following tables, build on the Board's activities and accomplishments of past years in technically rigorous oversight and constructive interaction with the DOE. Examples of related FY 1999 performance accomplishments that have supported the Board's objectives are also provided in the following tables. All such activities and accomplishments have been publicly identified in documents such as the Board's Annual Reports, letters, technical reports, and previous budget requests. The Board's actions described in the following tables are also based on its assessment of progress expected in FY 2000 and on major DOE efforts planned during FY 2001, which in turn are predicated on many factors, most importantly, the DOE budget and its accomplishments during this period.

3.3.2 Adjustments to the FY 2000 Performance Goals

The Board's FY 1999 Performance Plan preliminarily identified 6 specific FY 2000 annual performance goals in support of this General Goal and its associated objectives. This modified FY 2000 Performance Plan, written in accordance with the structure of the Board's updated Strategic Plan, captures all of the performance goal targets previously identified for FY 2000 within two broader-scope annual performance goals that have, collectively, 13 primary reviews.

The primary external factor that may drive mid-year modifications to the annual performance goals outlined in the following tables relates to the changing schedules of DOE activities driven by revised priorities.

SAFE DISPOSITION OF HAZARDOUS REMNANTS OF WEAPONS PRODUCTION

Objective 3-A: **Material Stabilization:** The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal, as needed.

xamples of FY 1999 Accomplishments	FY 2000 Performance Goals	FY 2001 Performance Goals
<p>Improved Remediation Schedules for Legacy Materials. In December 1998, after numerous formal and direct interactions with the Board and its staff, DOE issued an up-to-date plan and schedule for addressing the numerous health and safety risks posed by the highest priority legacy materials stored throughout the DOE nuclear weapons complex, originally identified by the Board in Recommendation 94-1. However, the Board identified several deficiencies in the new plan, and soon thereafter discovered that site-level planning did not support several significant commitments. The Board has engaged DOE on these issues, and will see that they are resolved expeditiously.</p> <p>Operational Problems at Savannah River Site. In the spring of 1999, the Board’s continuing review of operational data for DOE defense nuclear facilities revealed a negative trend in control of work and operations at the Savannah River Site. The Board issued a letter to DOE in May 1999 identifying this problem to DOE, stating that a broader look at the underlying causes and a systematic understanding of those causes would be required to correct weaknesses in performance. In response, DOE has undertaken corrective actions to reverse this trend and ensure a sustained, highly satisfactory level of performance.</p> <p>Completion of Recommendation 94-3 at Rocky Flats. The Board issued Recommendation 94-3, <i>Rocky Flats Plutonium Storage</i>, to ensure that the large quantity of plutonium at the Rocky Flats Environmental Technology Site would be safely stored. The Board recommended that DOE take a systematic approach to evaluating the suitability of Building 371 for the proposed new mission of storing the site’s entire plutonium inventory, and prepare a program plan for building upgrades and improvements consistent with the building’s mission. As a result of the Board’s recommendation, upgrades to the building’s structure, systems, and components, as well as the safety basis, were completed during Fiscal Year 1999. The Board closed this recommendation and now considers the building adequate for its current storage mission.</p> <p>Characterization and Safety of Hanford High-Level Waste Tanks. The Board and its staff have continued to press DOE to resolve the health and safety issues presented by the 177 high-level waste tanks at Hanford. In 1999, the Board worked closely with DOE to develop a strategy for resolving the remaining safety-related uncertainties in the characterization of the wastes, and to ensure that DOE developed a sound strategy for mitigating flammable gas retention problems in Tank 241-SY-101. Because of these efforts, Board Recommendation 93-5, dealing with Hanford high-level waste characterization, is expected to be closed shortly, and the Board expects that DOE will be able to resolve the Tank 241-SY-101 problem in FY 2000.</p>	<p>The Board and its staff will complete 9 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 process operations, the safety of ongoing operations, and the suitability of long-term storage and disposal facilities. Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none">• Stabilization and packaging of plutonium metal and oxide at Savannah River, Rocky Flats, Hanford, and LLNL (<i>Recommendation 94-1</i>)• Stabilization and disposal of plutonium-bearing solutions and residues at Savannah River, Rocky Flats, and Hanford (<i>Recommendation 94-1</i>)• Characterization, stabilization, and packaging of special isotopes, including uranium-233 materials at Oak Ridge (<i>Recommendation 97-1</i>), neptunium and americium/curium solutions at Savannah River (<i>Recommendation 94-1</i>), and uranium in the Molten Salt Reactor Experiment at Oak Ridge (<i>Recommendation 94-1</i>)• Stabilization and disposition of highly-enriched uranium solutions at Savannah River (<i>Recommendation 94-1</i>)• New and modified plutonium storage facilities, such as the Savannah River Site’s K-Area Materials Storage Facility, and modifications to storage vaults at the Hanford Plutonium Finishing Plant• Characterization and planning for treatment of high-level waste at the Hanford Site; selection of a treatment process for high-level waste liquids and salts at the Savannah River Site (<i>Recommendation 96-1</i>)• Remediation of flammable gas safety issues in the Hanford high-level waste tank farms, particularly Tank 241-SY-101 (<i>Recommendation 93-5</i>)• Safe start-up of the new Replacement High-Level Waste Evaporator at Savannah River• Selection of a process for treating and immobilizing high-level waste liquids and calcine at INEEL• Stabilization of spent nuclear fuel at the Savannah River H-Canyon (<i>Recommendation 94-1</i>)	<p>The Board and its staff will complete 8 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 process operations, the safety of ongoing operations, and the suitability of long-term storage and disposal facilities. Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none">• Stabilization and packaging of plutonium metal and oxide at Savannah River, Rocky Flats, Hanford, and LANL (<i>Recommendation 94-1</i>)• Stabilization and disposal of plutonium-bearing solutions and residues at Savannah River, Rocky Flats, Hanford, and LANL (<i>Recommendation 94-1</i>)• Characterization, stabilization, and packaging of special isotopes, including uranium-233 materials (<i>Recommendation 97-1</i>), neptunium and americium/curium solutions (<i>Recommendation 94-1</i>), and Molten Salt Reactor Experiment uranium (<i>Recommendation 94-1</i>)• Stabilization and disposition of highly-enriched uranium solutions at Savannah River (<i>Recommendation 94-1</i>)• Designs and technologies of the proposed Plutonium Immobilization Facility and Pit Disassembly and Conversion Facility, and their interfaces with the proposed mixed oxide fuel fabrication facility• Planning for treatment of high-level waste at the Hanford Site; design of the chosen treatment process for high-level waste liquids and salts at the Savannah River Site (<i>Recommendation 96-1</i>)• Design, construction, and testing of high-level waste retrieval and transfer systems at Hanford• Safety of operations at Waste Isolation Pilot Plant (WIPP) as activities continue to ramp up from initial startup, and preparations to begin handling remote-handled transuranic wastes at WIPP, including preparations at the sites that will be the first to ship such wastes to WIPP• Implementation of newly issued DOE Order 435.1, <i>Radioactive Waste Management</i>, which governs all phases of the lifecycle of high-level, low level, transuranic, and mixed wastes

SAFE DISPOSITION OF HAZARDOUS REMNANTS OF WEAPONS PRODUCTION

Objective 3—B: **Facility Decommissioning:** The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.

Examples of FY 1999 Accomplishments	FY 2000 Performance Goals	FY 2001 Performance Goals
<p>Upgraded Safety Controls for Decommissioning at Rocky Flats. Decommissioning activities are being conducted in several buildings at the Rocky Flats Environmental Technology Site. The Board identified that safety controls for protection of the workers did not provide the desired level of protection, because of an inappropriate reliance upon personal protective equipment (e.g., respirators) rather than engineered controls to eliminate or mitigate hazards. Furthermore, when engineered controls were used (e.g., air movers), they were not adequately analyzed to ensure that they produced the desired result. In response to these concerns, a multi-disciplinary team was chartered at RFETS to develop more rigorous engineered controls and analyze performance of the controls. Enhanced worker protection controls are now being applied to demolition of contaminated equipment at the site. RFETS is also investigating the use of remote equipment for size reduction for contaminated equipment.</p> <p>Activity Level ISM of Hanford Decommissioning Work: The Board's staff reviewed planning and implementation of decommissioning work that is being done by the Hanford Environmental Restoration Contractor. The staff found that the work control procedures and practices need improvement to meet the intent of Integrated Safety Management. The approach to hazard analysis does not use techniques such as those described by the American Institute of Chemical Engineers, <i>Guidelines for Hazard Evaluation Procedures</i>, or the U. S. Department of Labor, Occupational Safety and Health Administration (OSHA) publication, OSHA 3071, <i>Job Hazard Analysis</i>. These deficiencies are such that it is not clear that the controls are adequate to protect personnel performing decommissioning work at Hanford. Some areas of needed improvement have been directly communicated to DOE.</p> <p>Radiation Protection Measures for Metal Tritides during Decommissioning: During FY1999, the Board's staff evaluated radiation protection program measures for decommissioning work in areas at the Miamisburg Environmental Management Project (MEMP) that are suspected of being contaminated with tritium compounds such as metal tritides. As a result of staff visits and subsequent information exchanges, the MEMP contractor prepared a corrective action plan to address deficiencies in the radiation protection program, and work is proceeding to resolve these issues before major decommissioning work begins in mid-September 1999. These technical issues also apply to other defense nuclear facilities, so the Board has requested that DOE articulate a technical position on this matter to ensure that appropriate measures are implemented across the defense nuclear facilities complex. As a result of this action, DOE-EM informed DOE Field Offices of the issue, drafted a technical position regarding control levels for airborne radioactivity, and has committed to developing an updated technical approach</p>	<p>The Board and its staff will conduct 4 assessments of the adequacy of plans, standards, procedures, and execution for four activities associated with decommissioning of DOE defense nuclear facilities. These assessments will be conducted using the principles of integrated safety management to ensure that decommissioning efforts are performed safely. Additionally, the Board and its staff will continue efforts to confirm that high-risk facilities are decommissioned in a timely manner. These assessments are conducted in collaboration with State and other regulatory authorities, as needed, and on a schedule that supports DOE's operational plans. Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none"> • Building 324 and/or 327, 233-S Facility, or Canyon Initiative at Hanford • Building 771 or 776 at Rocky Flats • Building 9206 at Oak Ridge • CPP-603 spent nuclear fuel basins at INEEL 	<p>The Board and its staff will conduct 3 assessments of the adequacy of plans, standards, procedures, and execution for three activities associated with decommissioning of DOE defense nuclear facilities. These assessments will be conducted using the principles of integrated safety management to ensure that decommissioning efforts are performed safely. Additionally, the Board and its staff will continue efforts to confirm that high-risk facilities are decommissioned in a timely manner. These assessments are conducted in collaboration with State and other regulatory authorities, as needed, and on a schedule that supports DOE's operational plans. Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none"> • Hanford Plutonium Finishing Plant deactivation planning • Building 771 or 776 at Rocky Flats • Building 9206 at Oak Ridge • Decommissioning activity at Savannah River • High-level waste tank closure plans at INEEL

STATUTORY MISSION OF THE BOARD

Congress established the Defense Nuclear Facilities Safety Board (Board) in Public Law 100–456 on September 29, 1988. The statutory mission of the Board includes the following major functions:

- **Review and Evaluation of Standards.** The Board shall review and evaluate the content and implementation of the standards relating to the design, construction, operation, and decommissioning of defense nuclear facilities of the Department of Energy (DOE) including all applicable DOE Orders, regulations, and requirements at each department of Energy defense nuclear facility. The Board shall recommend to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected. The Board shall include in its recommendations necessary changes in the content and implementation of such standards, as well as matters on which additional data or additional research is needed.
- **Investigations.** The Board shall investigate any event or practice at a Department of Energy defense nuclear facility which the Board determines has adversely affected, or may adversely affect, public health and safety.
- **Analysis of Design and Operational Data.** The Board shall have access to and may systematically analyze design and operational data, including safety analysis reports, from any Department of Energy defense nuclear facility.
- **Review of Facility Design and Construction.** The Board shall review the design of a new Department of Energy defense nuclear facility before construction of such facility begins and shall recommend to the Secretary of Energy, within a reasonable time, such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety. During the construction of any such facility, the Board shall periodically review and monitor the construction and shall submit to the Secretary of Energy, within a reasonable time, such recommendations relating to the construction of that facility as the Board considers necessary to ensure adequate protection of public health and safety. An action of the Board, or a failure to act, under this paragraph may not delay or prevent the Secretary of Energy from carrying out the construction of such a facility.
- **Recommendations.** The Board shall make such recommendations to the Secretary of Energy with respect to Department of Energy defense nuclear facilities, including the operations of such facilities, standards, and research needs, as the Board determines are necessary to ensure adequate protection of public health and safety. In making its recommendations, the Board shall consider the technical and economic feasibility of implementing the recommended measures.

Created as an independent establishment within the Executive Branch, the Board is made up of five Members appointed from civilian life by the President, by and with the advice and consent of the Senate. The Board's enabling statute requires that the Board Members be respected experts in the field of nuclear safety with demonstrated competence and knowledge relevant to the independent investigation and oversight functions of the Board. The Senate confirmed the first five Board Members on October 19, 1989.

OBJECT CLASS SUMMARY

Actual obligations for FY 1999, projected obligations for FY 2000, and the Board's Budget Request for FY 2001, are presented by object class accounts in Exhibit A on the following page. The Board proposes to utilize the budget resources requested in the following manner:

Salaries and Benefits. The FY 2001 expenditure request includes funding of \$13,376,000 to support the projected salary and benefit costs for the five DNFSB Board Members and 100 full-time staff. As stated earlier, the funding for salaries and benefits represents 71 percent of the Board's FY 2001 Budget Request. In calculating the projected salary needs of the Board, the following federal pay adjustment factor for the Executive Branch employees is used:

- Pay increase of 3.7 percent beginning in January 2001.

Agency contributions for employees covered by the Civil Service Retirement System increased by 1.51 percent beginning in October 1997. Consequently, employee benefits are estimated at 24 percent of base salaries or \$24,028 per FTE in FY 2001.

In establishing the Board, Congress sought to bring the very 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 has and will continue to be critical to the successful accomplishment of the Board's mission. The Board has assembled a small 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 weapons safety, storage of nuclear materials and nuclear criticality safety, and waste management. As an indication of the Board's technical talent, 26 percent of the technical staff hold degrees at the Ph.D. level and an additional 67 percent have masters degrees. Almost all technical staff members, except interns, 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. Therefore, it is of paramount importance that the Board receive 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. Two full-time site representatives are stationed at the Pantex site to oversee nuclear weapons activities including the weapons stockpile stewardship and weapons disassembly programs, and two site representatives are stationed at the Hanford site to monitor waste characterization and stabilization and facility deactivation. The Board has assigned two full-time site representatives at Rocky Flats to monitor the DOE effort to deactivate facilities and stabilize and store the large plutonium inventory at the site, and two site representatives at Savannah River to monitor the DOE's efforts to deactivate

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

FY 2001 CONGRESSIONAL BUDGET REQUEST - 2/4/00

BUDGET ACCOUNT	COST ELEMENT	FY 1999 OBLIGATIONS (ACTUAL)	FY 2000 FINANCIAL PLAN	FY 2001 BUDGET REQUEST
PERSONNEL SALARIES -- (11)		\$8,783,489	\$9,768,000	\$10,754,000
PERSONNEL BENEFITS -- (12)		\$2,303,141	\$2,334,000	\$2,622,000
TRAVEL -- (21)		\$535,308	\$604,000	\$600,000
TRANSPORTATION OF THINGS -- (22)		\$155,962	\$121,000	\$51,000
RENTAL PAYMENTS TO GSA -- (23.1)		\$2,160,000	\$2,044,000	\$2,187,000
COMMUNICATIONS & UTILITIES -- (23.3)		\$123,560	\$125,000	\$142,000
PRINTING & REPRODUCTION -- (24)		\$26,356	\$31,000	\$31,000
CONSULTING SERVICES -- (25.1)		\$2,082,092	\$1,500,000	\$1,000,000
OTHER SERVICES -- (25.2)		\$1,006,929	\$787,000	\$839,000
GOVERNMENT SERVICES -- (25.3)		\$174,745	\$200,000	\$225,000
SUPPLIES & MATERIALS -- (26)		\$282,536	\$230,000	\$230,000
EQUIPMENT -- (31)		\$170,749	\$240,000	\$240,000

*** TOTAL OBLIGATIONS ***		\$17,804,867	\$17,984,000	\$18,921,000
NEW BUDGET AUTHORITY		\$16,500,000	\$16,935,000*	\$18,500,000
UNOBLIGATED BALANCE - PREV. FY		\$2,842,828	\$2,017,834	\$968,834
RECOVERY OF PRIOR YR OBLIGATIONS		\$479,873	\$0	\$0
TOTAL BUDGETARY RESOURCES		\$19,822,701	\$18,952,834	\$19,468,834
EST. UNOBLIGATED BAL. - CUR. FY		\$2,017,834	\$968,834	\$547,834
APPROPRIATION		\$16,500,000	\$16,935,000	\$18,500,000
OUTLAYS		\$17,026,790	\$17,500,000	\$18,000,000
STAFF & BOARD MEMBERS (FTE's)		94	99	105

*\$17,000,000 appropriation; \$65,000 rescission

EXHIBIT A

facilities, stabilize waste materials, and store and process tritium. The Board has assigned two full-time site representatives to monitor safety and health conditions at Oak Ridge Y-12, and other defense nuclear facilities in this area.

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 first-hand 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 \$600,000 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 fulfill the Board's statutory mission. 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. During FY 1999, Board Members, technical staff and the Board's outside technical experts made 185 team visits to major defense nuclear sites in support of its high priority public health and safety 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 first hand information on the demonstrated readiness, capabilities, and performance of the DOE and its contractors for ensuring safety in the conduct of such activities.

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

Transportation of Things. The Board has included \$51,000 in its FY 2001 Budget Request for the shipment of household goods for employees relocating to the Washington, DC area or to DOE sites.

Rental Payments to GSA. The Board requests funds totaling \$2,187,000 to reimburse the General Services Administration (GSA) for projected office rental costs. This overhead expense represents approximately 12 percent of the Board's FY 2001 Budget Request.

Communications and Utilities. The FY 2001 Budget Request includes \$142,000 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.

Printing and Reproduction. The budget request includes \$31,000 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 the Congress and technical reports, are also included in this account.

Consulting Services. Although authorized by Congress and the President to have up to 150 FTEs, due to budgetary constraints, the Board currently has only 96 full-time staff onboard. While the Board employs a highly capable staff, it is not practical or desirable to have permanent staff skilled in every specialty for which needs occur. For example, following several reviews at Pantex, the Board concluded that the potential hazards from lightning to nuclear explosive operations had not been adequately addressed by DOE. As this situation is unique to the weapons-related activity at Pantex, outside expertise in the area of lightning protection was acquired to assist the Board in its review.

The Board plans to continue to obtain outside technical experts in highly specialized areas. Expertise on the assembly and disassembly of certain specific nuclear weapon components may be needed. Such expertise may be required for short periods with little advance notice should an imminent or severe threat to public health and safety be identified at a DOE defense nuclear facility. Therefore, it is extremely important to have the funds necessary to immediately contract for this expertise when needed. Each outside 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 is included in Appendix C. The FY 2001 Budget Request includes \$1,000,000 in this account for technical support contracts to assist the Board in its health and safety reviews. This amount represents a 52 percent reduction from the amount obligated for this support in FY 1999.

Other Services. The budget request includes \$839,000 to fund the recurring administrative support needs of the Board in FY 2001 such as security services, court reporting expenses, employee training, records storage and retrieval services, and computer network maintenance.

Government Services. The Board's budget request includes \$225,000 to pay the cost of reimbursable support agreements with other federal agencies for administrative services such as accounting, payroll, health unit, and drug-free workplace testing and support.

Supplies and Materials. The Board requests \$230,000 to maintain the technical reference information for its in-house library, as well as for continued access to various technical computer databases, and for general office supplies and materials.

Equipment. The FY 2001 Budget Request includes \$240,000 to maintain the Board's information technology (IT) base. The Board will purchase replacement laptop computers for the technical and legal staffs to use on travel at the various defense nuclear sites. A number of older desktop computers will be replaced and upgraded as part of a continuing cycle to stay current with improvements in software and hardware. Funds will also be used for enhanced Internet security.

APPENDIX C

TECHNICAL SUPPORT CONTRACTS SUMMARY

A list of major technical support contracts, with a brief description of each contractor's areas of expertise, is included in this Appendix. The FY 2001 Budget Request includes \$1,000,000 in this account for technical support contracts to assist the Board in its health and safety reviews.

DEFENSE NUC. AR FACILITIES
SAFETY BOARD

TECHNICAL SUPPORT CONTRACTS
(Status as of 02/07/00)

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Dr. Harold M. Agnew	02/19/00	Provide expertise related to strategic safety issues associated with those facilities involved in the assembly, disassembly, and testing of nuclear weapons, specifically advising the Board in production, dismantlement/disposition, safe handling, testing, and storage of nuclear weapons, nuclear explosive devices, and nuclear weapon components, and the nuclear and hazardous materials used in these items; as well as assisting the Board in understanding the existing involvement of the design laboratories in these activities, and evaluating the sufficiency of current and proposed efforts.
Briere Associates, Inc.	09/30/00	Provide technical editing services of Board documents that include, but are not limited to technical reports, trip reports, its Annual Report to Congress, and Board Recommendations to the DOE. These services include analyzing manuscripts in terms of its objective, style, and manner of presentation and recommend revisions as appropriate.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
H&H Consultants, Inc.	09/30/00	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 analytical techniques utilized in structural analysis with special emphasis on seismic issues; adequacy of various types of analyses performed by DOE contractors; development and relevancy of standards and criteria used in the design and qualification of DOE facilities; and integration of programmatic structural issues from the overall historical prospective.
Dr. William E. Kastenberg	06/17/00	Provide assistance in the areas of probabilistic risk assessment and human reliability analysis of defense nuclear operations, specifically involving matters associated with the identification of high risk accidents, prioritization of safety related issues, and development of risk based design criteria for facilities handling special nuclear materials.
Dr. Joseph A. Leary	12/31/00	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 recent work include: evaluation of technologies to stabilize plutonium residues, plutonium storage safety issues, and Rocky Flats plutonium stabilization activities.

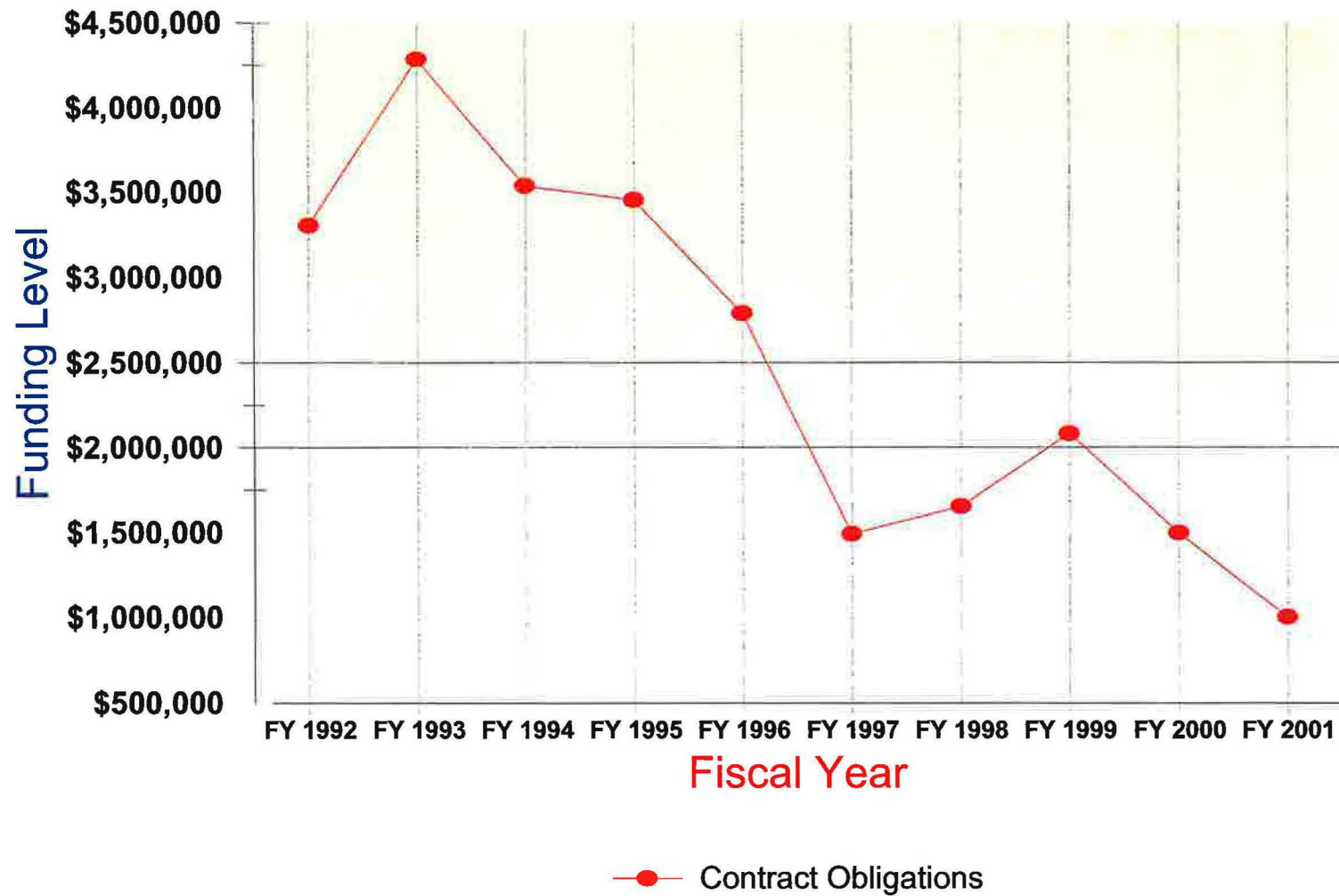
<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Dr. James L. Liverman	04/30/00	Provide technical support to the Board in the general subject area of radiation protection, specifically involving review and evaluation of DOE's Implementation Plan for Board Recommendation 91-6, amendments to 10 CFR 835 Rule, radiological protection standards, and other radiological and environmental health and safety issues.
Management Support Technology, Incorporated	01/31/01	Provide technical support to the Board, specifically involving evaluation of policies, standards, and procedures governing operations and maintenance as the operations and maintenance activities themselves and the training and qualification programs for operations, technical, support, and maintenance personnel. Recent work includes assisting the staff in evaluating the Department of Energy's development and implementation of Integrated Safety Management guidance in response to Board Recommendation 95-2. In addition, assistance has been provided in assessing operations and maintenance at the Savannah River Site, Idaho National Engineering and Environmental Laboratory, and the Rocky Flats Environmental Technology Site as they prepare to restart defense nuclear facilities and activities.
Lary M. McGrew	01/31/01	Provide expertise related to the strategic 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

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Lary M. McGrew (Continued)	01/31/01	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 dismantlement process at the Pantex plant.
Dr. Sol Pearlstein	09/30/00	Provide technical support to the Board specifically related to criticality safety reviews and other related fields including nuclear and reactor physics, and accelerator production of tritium. This effort includes participation in the review of safety analysis reports, DOE facility visits, presentation of lectures on criticality and related technical subjects to the staff, the development of specialized nuclear information or databases for Board applications, and assisting the staff in monitoring DOE performance on specific issues or Board Recommendations.
Paul C. Rizzo Associates, Inc.	09/30/00	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.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
J.D. Stevenson, Consulting Engineer	09/30/00	Provide technical support to the Board, specifically in the review and evaluation of systems and seismic engineering 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 analyses performed by DOE contractors; and hazard and systems classification.
Dr. Gerald Tape	11/30/00	Provide expertise related to strategic safety issues associated with those facilities involved in the assembly, disassembly, and testing of nuclear weapons, specifically advising the Board in production, dismantlement/disposition, safe handling, testing, and storage of nuclear weapons, nuclear explosive devices, and nuclear weapon components, and the nuclear and hazardous materials used in these items; as well as assisting the Board in understanding the existing involvement of the design laboratories in these current and proposed efforts.
Mr. Richard Collier	09/30/00	Provide expertise related to lightning safety issues at defense nuclear facilities. These efforts include assessing lightning safety issues in and around large structures.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Dr. Herbert Kouts	01/17/01	Provides a variety of technical expertise on a wide range of subjects associated with safety at DOE's defense nuclear facilities, including: safety management, criticality, DOE's 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.

Outside Technical Contracts by Fiscal Year



FY 2002 BUDGET REQUEST TO THE CONGRESS

Defense Nuclear Facilities Safety Board



April 2001



GPRA Strategic Planning Requirements

The Government Performance and Results Act of 1993 (GPRA) requires each agency to prepare and submit a strategic plan establishing long-term programmatic, policy, and management goals. The Defense Nuclear Facilities Safety Board's Strategic Plan for FY 1999-2004 is available on the Internet at www.dnfsb.gov. In addition, agencies are also required to develop annual performance plans which indicate the progress toward achievement of the strategic plan's goals and objectives. The Board's annual performance plan was submitted to the Office of Management and Budget on October 30, 2000, in accordance with the requirements of OMB-Circular A-11 and is incorporated as Appendix D in this Congressional Budget Request.

**Defense Nuclear Facilities
Safety Board**
FY 2002 Congressional Budget Request

APPROPRIATION & EXPENSE SUMMARY

(Tabular dollars in thousands).

OPERATING EXPENSES

	ACTUAL FOR <u>FY 2000</u>	PROJECTED FOR <u>FY 2001</u>	BUDGET REQUEST FOR <u>FY 2002</u>
New Budget Authority	16,935*	18,458**	18,500
Obligations	17,057	18,528	19,120
Outlays	16,968	17,800	18,500

Authorization:

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. 2011 et seq.) by adding new Chapter 21 -- Defense Nuclear Facilities Safety Board,

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).

* \$17,000,000 appropriation; \$65,000 rescission.

** \$18,500,000 appropriation; \$42,000 rescission.

**Defense Nuclear Facilities
Safety Board**
FY 2002 Congressional Budget Request

PERSONNEL SUMMARY

	<u>FY 2000 ACTUAL</u>	<u>FY 2001 BUDGET PLAN</u>	<u>FY 2002 BUDGET REQUEST</u>
Statutory Personnel Ceiling: (FTE's) ^{1/}	150	150	150
FTE Usage ^{2/}	94	99	105
<hr/>			
Board Members & Permanent Employees at End of Fiscal Year	95	105	105

^{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 safety 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 5 full-time Board Members.

**Defense Nuclear Facilities
Safety Board
FY 2002 Congressional Budget Request**

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, \$18,500,000, to remain available until expended. (*Energy and Water Development Appropriations Act, 2001*)

**Defense Nuclear Facilities
Safety Board
FY 2002 Congressional Budget Request**

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**Defense Nuclear Facilities
Safety Board
FY 2002 Congressional Budget Request**

1. EXECUTIVE SUMMARY

Appropriation Request for FY 2002

The Board's FY 2002 Budget Request is for \$18,500,000 and 105 Full-time Equivalent (FTE) staff years, which is equal to the amount appropriated for the Board's public and worker health and safety oversight activities in FY 2001. Barring a change in current U.S. national security policy or an unforeseen incident affecting DOE defense nuclear programs, an FY 2002 appropriation of \$18,500,000 should be sufficient to offset actual and planned statutory pay adjustments affecting staff salaries and benefits. This budget is needed for the Board to adequately conduct its statutorily mandated health and safety mission.

Background

The Defense Nuclear Facilities Safety Board (Board) is an independent Federal agency established by Congress in 1989. Broadly speaking, the Board's mandate under the Atomic Energy Act is safety oversight of the nuclear weapons complex operated by the Department of Energy (DOE). The nuclear weapons program remains a complex and hazardous operation. DOE must maintain readiness of the nuclear arsenal, dismantle surplus weapons, dispose of excess radioactive materials, clean up surplus facilities, and construct new facilities for many purposes. All of these functions must be carried out in a manner that protects the public, workers, and the environment. For a more detailed discussion of the Board's statutory mission, please see Appendix A.

Congress expects the Board to be an independent, expert agency capable of understanding the complexity of nuclear weapons facilities and operations. For that reason, Members of the Board are required by statute to be experts in the field of nuclear safety. The Board has, in turn, assembled a permanent staff with broad nuclear industry experience and competence in all major aspects of nuclear safety: nuclear, mechanical, electrical, chemical, and structural engineering, as well as physics and metallurgy. Currently, 92 percent of the Board's technical staff hold advanced degrees, of which 22 percent are at the Ph.D. level.

Safety Oversight Mission.

DOE is committed to numerous new design and construction projects during the next decade to provide nuclear weapons stockpile support for the Nation's defense and to resolve the remaining health and safety issues that are the historical legacy of weapons production. For example, tritium extraction for stockpile use, conduct of nuclear experimentation, and preservation of the strategic pit inventory, will require the Board to oversee the health and

safety of new defense nuclear operations. DOE's National Nuclear Security Administration also is developing a strategy that will change the balance and location of some defense nuclear work throughout the complex. As this strategy is implemented, some sites that have seen lesser amounts of nuclear work in recent years (such as the Lawrence Livermore National Laboratory and the Nevada Test Site) will significantly increase program activity.

While focusing attention on existing defense nuclear facilities and operations, the Board is also required by statute to review design efforts, construction activities, and the initial operation of new defense nuclear facilities, and to make timely recommendations on any needed public health and safety improvements to the Secretary of Energy. Safely implementing the transfer of hazardous defense nuclear activities between sites—with the associated need to assure competent personnel, rigorous authorization basis control, and effective operational safety management—will continue to pose many challenges for DOE and its contractors, as well as associated oversight challenges for the Board. This significant projected increase in workload, described more fully in Section 4 of this budget request, will require the Board to quickly replace the recent losses in its technical staff in the areas of design, safety analysis, and operations.

Replacement of Key Technical Personnel.

As clearly recognized by the Congress when establishing the Board, the ability to effectively carry out an independent, technical oversight program throughout the DOE weapons complex is heavily dependent on the technical capability of the Board Members and staff.

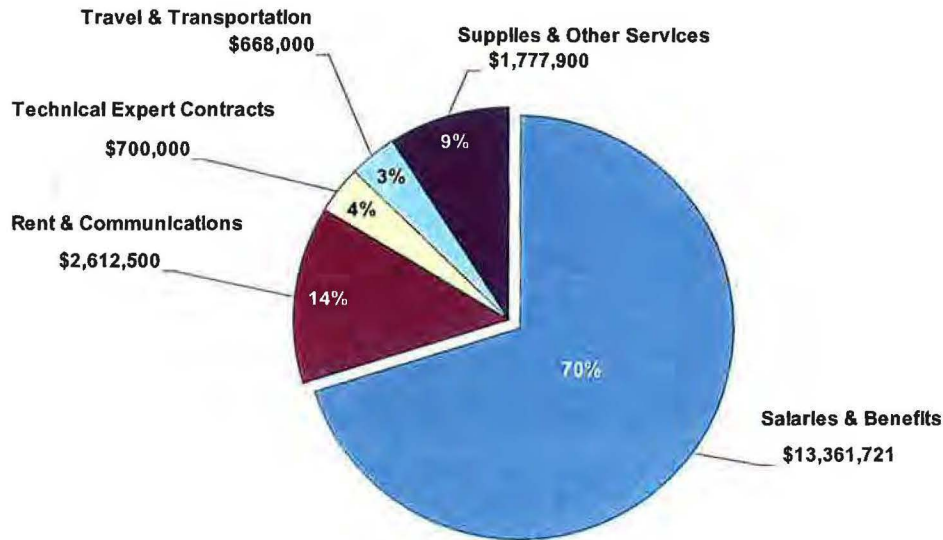
The conferees believe that the DNFSB is a unique Federal agency, in that its mission (is) to oversee the activities of another federal department whose work is highly technical and potentially dangerous, and that to properly carry out its mission, not only the DNFSB members but also its limited staff must be technically competent in all major phases of nuclear safety.¹

With the enactment of the Board's full appropriation of \$18,500,000 for FY 2001, the Board intends to replace key staff who have left the Board in previous fiscal years. Due to past funding constraints, the Board's staff has been reduced through attrition to 90 employees as of October 1, 2000, or ten below the Board's onboard strength in 1996. By the end of Fiscal Year 2001, the Board expects to hire ten replacement employees to reach the projected need of 105 for FY 2002 (includes five Board Members in total). These replacement hires will include: staff for a site office at the Los Alamos National Laboratory; nuclear weapons engineers; and design, safety analysis, and operations specialists.

As depicted in the following chart, the Board's budget is used primarily to pay the salaries and benefits of its employees, representing 70 percent of its total projected obligations for FY 2002.

¹ National Defense Authorization Act for Fiscal Year 1991, Conference Report, H.R. Conf. Rep. No. 923, 101st Cong., 2nd Sess. 767 (1990).

**FY 2002 BUDGET REQUEST
Total Projected Obligations**



In Summary

The technical complexity and safety risks associated with the life cycle of this Nation's nuclear weapons, including the overall health and safety of the public, dictate a continuing need for strong Federal leadership and support. Safety oversight programs that directly impact the health and safety of the public have traditionally been given priority consideration due to the potential for significant loss of life, injury, or property damage if an accident should occur.

These staff are needed to fulfill the Board's statutory public and worker health and safety oversight responsibilities directly related to DOE's nuclear weapons programs. Since the Board currently is operating at 60 percent of its statutory employment ceiling, the 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. For FY 2002, the Board requires sufficient resources to fully support 105 FTEs.

2. SAFETY OVERSIGHT STRATEGY

Maintaining an effective safety oversight program that fulfills the broad mandates of the Board's enabling legislation requires a constant reassessment of health and safety conditions throughout DOE's defense nuclear complex. The Board continues to focus its attention on the most hazardous DOE operations and complex-wide health and safety issues, consistent with the Board's safety oversight approach and its strategic plan. Specifically, the Board has prioritized the application of its resources to emphasize review activities at the following sites, plants, and facilities:

- *Pantex Plant (Texas)*—Stewardship and maintenance of the nuclear weapons stockpile including assembly, evaluation, maintenance, and dismantlement of nuclear explosives and the storage of special nuclear material, particularly plutonium pits.
- *Savannah River Site (South Carolina)*—Operation of existing tritium facilities and design and construction of new facilities for the extraction of tritium, the disassembly and conversion of weapon components in support of the active weapons stockpile, storage of special nuclear material, and the stabilization of high-level waste and residual materials from the former production of materials for the nation's nuclear weapons arsenal.
- *Nevada Test Site*—Stewardship of the nuclear weapons stockpile, including subcritical experiments, and the capability to deal with damaged nuclear weapons.
- *Oak Ridge Y-12 National Security Complex (Tennessee)*—Support for safe stewardship and maintenance of nuclear weapons in the processing of highly enriched uranium; fabrication, assembly, and disassembly of nuclear weapon components and subassemblies, and storage of nuclear materials, including uranium from disassembly of weapon components.
- *Los Alamos National Laboratory (New Mexico), Lawrence Livermore National Laboratory (California), and Sandia National Laboratories (New Mexico and California)*—Support for stockpile management and stewardship of the nation's nuclear weapons, including research and enhanced surveillance of aging weapons.
- *Hanford Site (Washington)*—Ongoing preparations for remediation of high-level radioactive waste, stabilization of corroding highly radioactive spent nuclear fuel currently stored in the K-East and K-West Basins, and stabilization of residual material from plutonium production.
- *Rocky Flats Environmental Technology Site (Colorado)*—Stabilization of residuals of plutonium production and deactivation of numerous highly contaminated buildings.

Sources of information used by the Board in formulating its assessments, evaluations, and recommendations to the Secretary of Energy are varied. They include testimony from public hearings and meetings, Congressional inquiries, reports from site representatives, staff issue papers, site visits, Implementation Plans for the Board's recommendations, responses to reporting requirements, and correspondence from workers and union representatives at the DOE sites. The Board's priorities change to reflect its assessment of the risks and potential effects on the health and safety of the public or workers, resulting in revised technical review assignments for the Board's staff.

On the basis of more than 11 years of operating experience, the Board has established the following guiding principles for maximizing the effective use of its resources:

- The primary responsibility for ensuring protection of the health and safety of the public and workers rests with DOE's line managers and extends in an unbroken chain from the Secretary of Energy to the workers on the floor.
- As an external action-forcing agency, the Board influences the actions of DOE's line management to the extent necessary to achieve improved safety objectives.
- Effective safety management demands that safety expectations be clearly defined and tailored to specific hazards at all levels—site, facility, and activity.
- Technical expertise is required to define and ensure compliance with controls commensurate with the identified hazards.
- Safety oversight activities are prioritized largely on the basis of risks to the public and workers. Key indicators are the types and quantities of nuclear material at risk, and the process and setting of the operations involved.
- Safety oversight responsibilities for defense nuclear facilities will be accomplished in full cooperation with other agencies, such as individual states and the Environmental Protection Agency with regard to final cleanup, demolition, and environmental restoration activities, in compliance with responsibilities mandated by the Atomic Energy Act of 1954, as amended, and federal environmental laws.

The Board continues to be sensitive to the need for public involvement. To that end, the Board has used open public meetings and hearings, as well as its Web Site (www.dnfsb.gov), to increase public awareness and communicate the Board's activities. The Board has also continued its practice of meeting with state and local officials, labor leaders, DOE's facility workers, citizen advisory boards, public interest groups, and area residents to exchange information and inform interested parties of the Board's work. Board Members have held public meetings and hearings in the vicinity of DOE's defense facilities, most recently in communities near the Hanford Site, the Savannah River Site, the Oak Ridge Reservation, the Rocky Flats Environmental Technology Site, and the Pantex Plant. To date, a total of 36 public meetings have been held at or near DOE sites and 43 in Washington, D.C. The records of these meetings are made available to the public.

3. SAFETY OVERSIGHT IN PRACTICE

Representative examples of the Board's contributions to the health and safety of the public and workers, resulting from the practical application of the above safety oversight principles, are discussed in the following paragraphs.

Fire Protection for Nuclear Explosive Operations at Pantex. The Board's unique role in overseeing the safety of operations in DOE's nuclear weapons complex encompasses such vital national activities as the assembly, disassembly, and surveillance of nuclear weapons at the Pantex Plant. Threats to the safety of these activities continue to be a major focus of the Board's reviews.

On the basis of several reviews at Pantex, the Board concluded that the potential hazards from fire to nuclear explosive operations had not been addressed comprehensively and consistently. In March 2000, the Board formally notified DOE that observed shortcomings in the Pantex Plant-wide alarm system, inconsistencies in the application of ultraviolet fire detectors, and inadequate fire protection assessment practices needed to be addressed quickly, to prevent a forced curtailment of operations and a potential impact on national security programs.

In response, DOE and its contractor formulated plans to accelerate replacement of the Plant-wide alarm system, upgrade the fire detection system, and formalize the fire protection controls as part of ongoing upgrades to the site's authorization basis. These corrective actions were then incorporated into the latest revision to DOE's Implementation Plan for the Board's Recommendation 98-2. The Board is continuing to review this important issue, emphasizing the completion of facility modifications and the development and implementation of improved control sets.

However, continuing review of these issues by the Board's staff brought to light a further complication. Safety analyses of fires postulated to occur during nuclear explosive operations at Pantex have traditionally focused on the effects of fire on the high explosive in a weapon system. Yet analyses performed at the Y-12 Plant indicated that other weapon subsystems may react energetically in thermal environments less severe than those evaluated for high explosives. A review of available fire test data indicated that fire testing of weapon systems has not included accurate models of these potentially sensitive components. In light of this information, existing Pantex fire hazard analyses may have underestimated the heat content of postulated process combustibles.

Therefore, in May 2000 the Board requested that DOE evaluate the implications of the hazard posed by potentially sensitive components in a fire environment and determine what short-term actions, including potential compensatory measures, are necessary to mitigate this hazard. The Board further urged DOE to evaluate the observed systemic deficiencies in the fire hazard analyses and controls at Pantex. DOE has acknowledged the need to address this issue, but actions to that end remain incomplete. In the interim, DOE has implemented compensatory controls on the handling of these canned subassemblies.

Implementation of Integrated Safety Management Systems. Every Secretary of Energy with whom the Board has interacted since 1989 has stressed the importance of safely performing DOE's missions. In its Recommendation 95-2, *Safety Management*, the Board urged DOE to restructure its safety management program to provide a more effective and integrated means of protecting the public, workers, and the environment.

Each of the three Secretaries of Energy, since Recommendation 95-2 was issued has personally affirmed DOE's commitment to the Integrated Safety Management (ISM) concept and made implementation of the concept a requirement for all of DOE's hazardous activities, nuclear and otherwise. In October 1998, Secretary Richardson committed to having ISM fully implemented at all DOE facilities by September 2000.

DOE has made substantial progress in upgrading its directives, institutionalizing and implementing ISM at facilities in the DOE complex, and establishing specific sets of safety control measures (authorization agreements) for work in facilities across the complex (authorization agreements for 50 defense nuclear facilities have been approved). However, reviews of specific projects by the Board's staff have revealed a number of safety issues that need to be addressed. Resolution of these issues requires the sustained attention of the Board and its staff.

Stabilization of Legacy Nuclear Materials. During the era of weapons production, plutonium and other weapon materials were in demand as feed materials, and plutonium-rich scrap from weapon fabrication processes was quickly recycled. This situation changed dramatically as DOE began to shut down weapon production activities at many defense nuclear facilities. As a result, substantial quantities of plutonium, uranium, transuranic isotopes, and irradiated fuel have remained in storage for extended periods under potentially unsafe and deteriorating conditions. To address this situation, the Board's Recommendation 94-1 counseled DOE to process these materials on an accelerated basis, converting them to stable forms and then packaging them for safe interim storage, pending decisions about their ultimate disposition. The Board followed this recommendation with Recommendation 97-1, which specifically addressed highly-radioactive Uranium-233 materials held at several DOE defense nuclear facilities, and Recommendation 2000-1, which reemphasized the importance of the legacy materials stabilization mission, established priorities for the significant quantity of materials remaining to be stabilized under Recommendation 94-1, and recommended that, as required by law, DOE identify and report funding shortfalls that prevented more timely action.

Significant risk reduction and stabilization of materials have been accomplished under the legacy nuclear materials program. A large portion of the plutonium solutions and residues, special isotopes, and irradiated fuel and targets have been stabilized. However, significant hazards remain, key stabilization activities have been delayed, and technical and programmatic difficulties threaten to cause further delays in risk reduction.

In response to continuing interactions with the Board, the Secretary of Energy issued a revised Implementation Plan for Recommendations 94-1 and 2000-1 on January 19, 2001. This latest plan establishes a path forward for all materials covered by Recommendation 94-1 and defines aspects of the program that were previously indeterminate. However, the Board's

evaluation concluded that activities at the Savannah River Site and Los Alamos National Laboratory are not being pursued with the requisite urgency, and other projects, notably the Hanford Spent Nuclear Fuel Project and the Savannah River Site Americium/Curium Vitrification Project, face major technical and programmatic challenges. Furthermore, it is apparent that significant quantities of legacy materials beyond those addressed by Recommendations 94-1, 97-1, and 2000-1 will require timely stabilization and disposition in order to prevent new storage hazards from developing. Given the limited progress made by DOE in resolving these issues, the Board expects that substantial effort will be required in the near term to ensure that stabilization and storage of these residual materials continues on an acceptable schedule and that appropriate stabilization capabilities are maintained in the DOE complex.

4. FUTURE CHALLENGES FOR THE BOARD'S SAFETY OVERSIGHT

The following discussion addresses some of the key challenges facing the Board in its safety oversight of DOE that will require continuing attention by the Board and its staff.

A number of new design and construction projects scheduled during the next decade are aimed at providing support for the nuclear weapons stockpile, as well as resolving the remaining health and safety issues that are the historical legacy of weapons production. Examples include the Highly Enriched Uranium Facility at the Y-12 National Security Complex; the Tritium Extraction Facility and the Pit Disassembly and Conversion Facility, both at the Savannah River Site; and the Cold Vacuum Drying Facility and Canister Storage Building, both elements of the Spent Nuclear Fuel Project at the Hanford Site. The Board's enabling statute requires that it review the design, construction, and operation of new defense nuclear facilities, and make timely recommendations to the Secretary of Energy on any needed public health and safety improvements. This significant projected increase in workload in design and construction will make substantial demands on the Board's resources in such areas as design, safety analysis, and operations.

To maximize the efficient use of its resources in direct support of the nuclear weapons stockpile, DOE is developing a strategy that will change the balance and location of some defense nuclear work throughout the complex. As this strategy is implemented, some sites that have seen lesser amounts of nuclear work in recent years (such as Lawrence Livermore National Laboratory and the Nevada Test Site) will be required to significantly increase the tempo of their efforts. Safely implementing the transfer of hazardous defense nuclear activities between sites—with the associated need to ensure competent personnel, rigorous authorization basis control, and effective operational safety management—will pose many challenges to DOE and its contractors, as well as associated oversight challenges to the Board.

The Board's oversight activities continue to reveal technical issues that have the potential to affect the safety of activities related to management of the nuclear weapons stockpile. For example, at the Board's urging, DOE improved its understanding of the threat posed by fire to nuclear weapons handling operations at the Pantex Plant, and is working to implement appropriate compensatory measures (see Section 3). DOE still must extend these

lessons learned to other defense nuclear sites, an area that will require continued attention by the Board and its staff.

DOE, in cooperation with the Department of Defense, is working to define the research, development, and manufacturing infrastructure that will be necessary to support the enduring stockpile in the absence of critical nuclear testing. Tritium extraction for stockpile use, the conduct of nuclear experimentation, and the production of new pits will require the Board to oversee the health and safety of new defense nuclear operations throughout the next decade and beyond. In addition, DOE is ramping up its programs to extend the life of weapons in the enduring stockpile. These life extension programs will require more complex operations than the current dismantlement campaigns, since they involve disassembly as well as reassembly and recertification of large numbers of stockpile weapons. To effectively oversee these operations effectively and at the same time strike a proper balance among national security requirements, schedules, and safety management issues, the Board will need to augment its technical staff with individuals who possess the necessary expertise.

The Rocky Flats Environmental Technology Site will be the first large-scale defense nuclear site to face total deactivation. All nuclear materials are scheduled to be removed from the site by 2006. The Board will need to continue its close oversight of DOE's progress toward deactivation of Rocky Flats, since a significant threat to worker safety arises as a result of the change in work activities from practices associated with production to less familiar and potentially more hazardous deactivation and decontamination tasks. In addition, the experience gained there has the potential to serve as a model for deactivation of the considerable number of excess facilities in the DOE complex.

The mission to conduct high-risk activities associated with facility deactivation will continue across the DOE defense nuclear complex at an increasing rate in the coming years. These activities involve hands-on, hazardous work that requires hazards evaluation, development of work controls and procedures, worker training, and conduct of operations. The Board's continued attention and commitment of resources will be required to ensure that DOE safely conducts these high-risk activities.

In response to the Board's urging and guidance, DOE has made considerable progress toward the development of programmatic direction for an ISM approach to its hazardous nuclear activities. However, independent internal DOE reviews, as well as observations by the Board and its staff, indicate that extensive experience, feedback, and improvement will be required before effective implementation of ISM and its associated cultural changes are fully realized across the entire DOE defense nuclear complex. The current rate of progress also may be challenged by the transition of several major contracts for defense nuclear site management, with the associated need to identify new sets of enforceable contractual health and safety requirements. The Board will need to devote significant resources to oversight of the new contractors to ensure that the ISM gains already achieved are continued.

Following considerable oversight and constructive engagement by the Board, DOE is currently in a peak period of activity for disposition of the hazardous remnants of nuclear weapons production. Substantial progress is being made toward characterizing, stabilizing, and dispositioning high hazard nuclear materials, and several associated new facilities are either in

design, construction, or initial operation. However, recent reviews have indicated that DOE is encountering difficulty in maintaining its momentum in this important arena of risk reduction. The Board will continue to urge DOE to restore the earlier pace of its activities associated with these new and inherently hazardous activities.

In March 2000, the Board issued Recommendation 2000-2, *Configuration Management, Vital Safety Systems*. This recommendation called on DOE to improve its requirements with regard to maintaining the integrity of key design features, specifications, and operational constraints for vital safety systems at defense nuclear facilities, using a definitive review of confinement ventilation systems by a team of subject matter experts as a paradigm for the correction of deficiencies. DOE's attempts to develop a suitable Implementation Plan for Recommendation 2000-2 have involved substantial interaction with the Board's staff. Even with the staff's involvement, however, considerable work remains before an acceptable Implementation Plan can be put in place and executed.

Since the end of the Cold War, maintaining the technical competence of Federal and contractor personnel essential to DOE's defense nuclear mission has been an increasingly difficult task. While the Board has always placed considerable emphasis on this vital aspect of safety management, skilled employees continue to leave the workforce. The turnover in senior DOE leadership that resulted from the changes in administrations, together with the ongoing reorganization initiatives at DOE, will necessitate close attention to the preservation of appropriate technical skills, abilities, and experience. The Board will need to apply significant resources to ensure that DOE maintains and develops the required technical capabilities and that the new line management emphasizes safety in the conduct of its operations.

Work in the above areas is essential to the fulfilment of the Board's mission and is assumed in its strategic planning. The Board's resources are already fully committed to existing safety activities, and accommodating this additional work will be challenging within the budget. The Board is recruiting technical personnel having additional and varied safety expertise to address the changing and expanding scope and nature of DOE's planned work.

5. CONCLUSION

In establishing the Board, Congress and the President intended that the Board assure and improve the safety of operations of DOE's defense nuclear facilities by providing independent, expert advice to the Secretary of Energy, identifying the nature and consequences of any significant potential threats to public health and safety, and elevating such issues to the highest levels of authority.

The five Board Members, together with a small but highly competent staff, provide a cost-effective organizational arrangement for achieving the added safety assurance that the public seeks and rightfully expects. The Board's budget request of \$18.5 million, to be used for staff salaries and required overhead expenses, such as travel to DOE's defense nuclear facilities, represents the funding needed to support the health and safety review actions planned

by the Board for Fiscal Year 2002. This amount constitutes a wise investment towards 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.

STATUTORY MISSION OF THE BOARD

Congress established the Defense Nuclear Facilities Safety Board (Board) in Public Law 100–456 of September 29, 1988. Created as an independent establishment within the Executive Branch, the Board is made up of five Members appointed from civilian life by the President, by and with the advice and consent of the Senate. The Board's enabling statute requires that the Board Members be respected experts in the field of nuclear safety with demonstrated competence and knowledge relevant to the independent investigation and oversight functions of the Board. The Senate confirmed the first five Board Members on October 19, 1989. The statutory mission of the Board includes the following major functions:

- **Review and Evaluation of Standards.** The Board shall review and evaluate the content and implementation of the standards relating to the design, construction, operation, and decommissioning of defense nuclear facilities of the Department of Energy (DOE) including all applicable DOE Orders, regulations, and requirements at each Department of Energy defense nuclear facility. The Board shall recommend to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected. The Board shall include in its recommendations necessary changes in the content and implementation of such standards, as well as matters on which additional data or additional research is needed.
- **Investigations.** The Board shall investigate any event or practice at a Department of Energy defense nuclear facility which the Board determines has adversely affected, or may adversely affect, public health and safety.
- **Analysis of Design and Operational Data.** The Board shall have access to and may systematically analyze design and operational data, including safety analysis reports, from any Department of Energy defense nuclear facility.
- **Review of Facility Design and Construction.** The Board shall review the design of a new Department of Energy defense nuclear facility before construction of such facility begins and shall recommend to the Secretary of Energy, within a reasonable time, such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety. During the construction of any such facility, the Board shall periodically review and monitor the construction and shall submit to the Secretary of Energy, within a reasonable time, such recommendations relating to the construction of that facility as the Board considers necessary to ensure adequate protection of public health and safety. An action of the Board, or a failure to act, under this paragraph may not delay or prevent the Secretary of Energy from carrying out the construction of such a facility.

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

OBJECT CLASS SUMMARY

Actual obligations for FY 2000, projected obligations for FY 2001, and the Board's Budget Request for FY 2002, 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 2002 expenditure request includes funding of \$13,361,721 to support the projected salary and benefit costs for 105 FTEs. The funding for salaries and benefits represents a majority of the Board's FY 2002 Budget Request. In calculating the projected salary and benefits needs of the Board, the following federal pay adjustment and benefits factors for the Executive Branch employees are used:

- Pay increase of 3.6 percent beginning in January 2002.
- Employee benefits of 24 percent of base salaries, or \$22,985 per FTE in FY 2002.

In establishing the Board, Congress sought to bring the very 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 has and will continue to be critical to the successful accomplishment of the Board's mission. The Board has assembled a small 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 weapons safety, storage of nuclear materials and nuclear criticality safety, and waste management. As an indication of the Board's technical talent, 22 percent of the technical staff hold degrees at the Ph.D. level and an additional 70 percent have masters degrees. Almost all technical staff members, except interns, 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. Therefore, it is of paramount importance that the Board receive 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. As of January 2001, two full-time site representatives are stationed at the Pantex site to oversee nuclear weapons activities, including the weapons stockpile stewardship and weapons disassembly programs, and two site representatives are stationed at the Hanford site to monitor waste characterization and stabilization and facility deactivation. The Board has assigned one full-time site representatives at Rocky Flats to monitor the DOE effort to deactivate facilities and stabilize and store the large plutonium inventory at the site, and two site representative at Savannah River to monitor the DOE's efforts to deactivate facilities, stabilize waste materials, and store and process tritium. The Board has assigned two full-time site representatives to

monitor safety and health conditions at Oak Ridge Y-12, and other defense nuclear facilities in this area.

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 first-hand 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.

Because of increased activity and future DOE plans, the Board will establish an on-site presence in FY 2001 at the Los Alamos National Laboratory (LANL). By adding a site representative to LANL, the Board will be able to better perform its health and safety oversight responsibilities at this lab.

Travel. The Board requests \$578,000 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 fulfill the Board's statutory mission. 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. During FY 2000, Board Members, technical staff and the Board's outside technical experts made approximately 190 team visits to major defense nuclear sites in support of its high priority public health and safety 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 first hand information on the demonstrated readiness, capabilities, and performance of the DOE and its contractors for ensuring safety in the conduct of such activities.

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

Transportation of Things. The Board has included \$90,000 in its FY 2002 Budget Request for the shipment of household goods for employees relocating to the Washington, DC area or to DOE sites.

Rental Payments to GSA. The Board requests funds totaling \$2,409,000 to reimburse the General Services Administration (GSA) for projected office rental costs. This overhead expense represents approximately 13 percent of the Board's FY 2002 Budget Request.

Communications and Utilities. The FY 2002 Budget Request includes \$203,500 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.

Printing and Reproduction. The budget request includes \$37,900 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 the Congress and technical reports, are also included in this account.

Consulting Services. Although authorized by Congress and the President to have up to 150 FTEs, due to budgetary constraints, the Board had only 90 full-time staff onboard as of October 1, 2000. While the Board employs a highly capable staff, it is not practical or desirable to have permanent staff skilled in every specialty for which needs occur. For example, following several reviews at Pantex, the Board concluded that the potential hazards from lightning to nuclear explosive operations had not been adequately addressed by DOE. As this situation is unique to the weapons-related activity at Pantex, outside contractor expertise in the area of lightning protection was acquired to assist the Board in its review.

The Board plans to continue to obtain outside technical experts in highly specialized areas. Expertise on the assembly and disassembly of certain specific nuclear weapon components may be needed. Such expertise may be required for short periods with little advance notice should an imminent or severe threat to public health and safety be identified at a DOE defense nuclear facility. Therefore, it is extremely important to have the funds necessary to immediately contract for this expertise when needed. Each outside 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 is included in Appendix C. The FY 2002 Budget Request includes \$700,000 in this account for technical support contracts to assist the Board in its health and safety reviews. This amount represents a 9 percent reduction from the amount obligated for this support in FY 2000.

Other Services. The budget request includes \$887,600 to fund the recurring administrative support needs of the Board in FY 2002 such as security services, court reporting expenses, employee training, records storage and retrieval services, and computer network maintenance.

Government Services. The Board's budget request includes \$318,000 to pay the cost of reimbursable support agreements with other federal agencies for administrative services such as accounting, payroll, health unit, and drug-free workplace testing and support.

Supplies and Materials. The Board requests \$216,200 to maintain the technical reference information for its in-house library, as well as for continued access to various technical computer databases, and for general office supplies and materials.

Equipment. The FY 2002 Budget Request includes \$318,200 to maintain the Board's information technology (IT) base. The Board will purchase replacement laptop computers for the technical and legal staffs to use on travel at the various defense nuclear sites. A number of older desktop computers will be replaced and upgraded as part of a continuing cycle to stay current with improvements in software and hardware. Funds will also be used for enhanced Internet security.

Defense Nuclear Facilities Safety Board

FY 2002 CONGRESSIONAL BUDGET REQUEST - 03/19/2001

BUDGET ACCOUNT	COST ELEMENT	FY 2000 OBLIGATIONS (ACTUAL)	FY 2001 FINANCIAL PLAN	FY 2002 BUDGET REQUEST
-----	-----	-----	-----	-----
PERSONNEL SALARIES -- (11)		\$ 9,391,871	\$ 10,221,319	\$ 10,815,000
PERSONNEL BENEFITS -- (12)		\$ 2,237,386	\$ 2,425,992	\$ 2,546,721
TRAVEL -- (21)		\$ 568,222	\$ 600,000	\$ 578,000
TRANSPORTATION OF THINGS -- (22)		\$ 156,621	\$ 105,000	\$ 90,000
RENTAL PAYMENTS TO GSA -- (23.1)		\$ 2,044,000	\$ 2,276,000	\$ 2,409,000
COMMUNICATIONS & UTILITIES (23.3)		\$ 187,752	\$ 199,000	\$ 203,500
PRINTING & REPRODUCTION -- (24)		\$ 32,260	\$ 37,000	\$ 37,900
CONSULTING SERVICES -- (25.1)		\$ 759,682	\$ 725,000	\$ 700,000
OTHER SERVICES -- (25.2)		\$ 900,342	\$ 1,015,000	\$ 887,600
GOVERNMENT SERVICES -- (25.3)		\$ 287,857	\$ 400,000	\$ 318,000
SUPPLIES & MATERIALS -- (26)		\$ 202,029	\$ 212,000	\$ 216,200
CAPITAL ASSETS -- (31)		\$ 289,446	\$ 312,000	\$ 318,200
		-----	-----	-----
*** TOTAL OBLIGATIONS ***		\$ 17,057,468	\$ 18,528,311	\$ 19,120,121
NEW BUDGET AUTHORITY		\$ 16,935,000*	\$ 18,458,000**	\$ 18,500,000
UNOBLIGATED BALANCE - PREV. FY		\$ 2,017,834	\$ 2,042,873	\$ 1,972,562
RECOVERY OF PRIOR YR OBLIGATIONS		\$ 147,507	\$ -	\$ -
TOTAL BUDGETARY RESOURCES		\$ 19,100,341	\$ 20,500,873	\$ 20,472,562
EST. UNOBLIGATED BAL. - CUR. FY		\$ 2,042,873	\$ 1,972,562	\$ 1,352,441
APPROPRIATION		\$ 16,935,000	\$ 18,458,000	\$ 18,500,000
OUTLAYS		\$ 16,967,848	\$ 17,800,000	\$ 18,500,000
STAFF & BOARD MEMBERS (FTE'S)		94	99	105

*\$17,000,000 appropriation; \$65,000 rescission

**\$18,500,000 appropriation; \$42,000 rescission

TECHNICAL SUPPORT CONTRACTS SUMMARY

A list of major technical support contracts, with a brief description of each contractor's areas of expertise, is included in this Appendix. The FY 2002 Budget Request includes \$700,000 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 03/14/01)

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Dr. Harold Agnew	02/19/02	Provide expertise related to strategic safety issues associated with those facilities involved in the assembly, disassembly, and testing of nuclear weapons, specifically advising the Board in production, dismantlement/disposition, safe handling, testing, and storage of nuclear weapons, nuclear explosive devices, and nuclear weapon components, and the nuclear and hazardous materials used in these items; as well as assisting the Board in understanding the existing involvement of the design laboratories in these activities, and evaluating the sufficiency of current and proposed efforts.
Briere Associates, Inc.	09/30/01	Provide technical editing services of Board documents that include, but are not limited to technical reports, trip reports, the Annual Report to Congress, and Board Recommendations to the DOE. These services include analyzing manuscripts in terms of objective, style, and manner of presentation and recommend revisions as appropriate.
Mr. Richard Collier	12/31/01	Provide expertise related to lightning safety issues at defense nuclear facilities. These efforts include assessing lightning safety issues in and around large structures.
Dr. Herbert Kouts	12/31/01	Provide technical expertise on a wide range of subjects associated with safety at DOE's defense nuclear facilities, including: safety management, criticality, DOE's stabilization, storage and disposition of nuclear materials, nuclear reactor physics, 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	12/31/01	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 recent work include: evaluation of technologies to stabilize plutonium residues, plutonium storage safety issues, and Rocky Flats plutonium stabilization activities.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

TECHNICAL SUPPORT CONTRACTS

(Status as of 03/14/01)

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Dr. James L. Liverman	04/30/01	Provide technical support to the Board in the general subject area of radiation protection, specifically involving review and evaluation of DOE's Implementation Plan for Board Recommendation 91-6, amendments to 10 CFR 835 Rule, radiological protection standards, and other radiological and environmental health and safety issues.
Larry M. McGrew	01/31/02	Provide expertise related to the strategic 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.
Management Support Technologies, Incorporated	02/28/02	Provide technical support to the Board, specifically involving evaluation of policies, standards, and procedures governing operations and maintenance and the training and qualification programs for operations, technical support, and maintenance personnel. Assist the staff in evaluating the DOE's development and implementation of Integrated Safety Management guidance in response to Board Recommendation 95-2. Assist staff in assessing operations and maintenance at Defense Nuclear Facilities.
Dr. Sol Pearlstein	09/30/01	Provide technical support to the Board specifically related to criticality safety reviews and other related fields including nuclear and reactor physics, and accelerator production of tritium. This effort includes participation in the review of safety analysis reports, DOE facility visits, presentation of lectures on criticality and related technical subjects to the staff, the development of specialized nuclear information or databases for Board applications, and assisting the staff in monitoring DOE performance on specific issues or Board Recommendations.

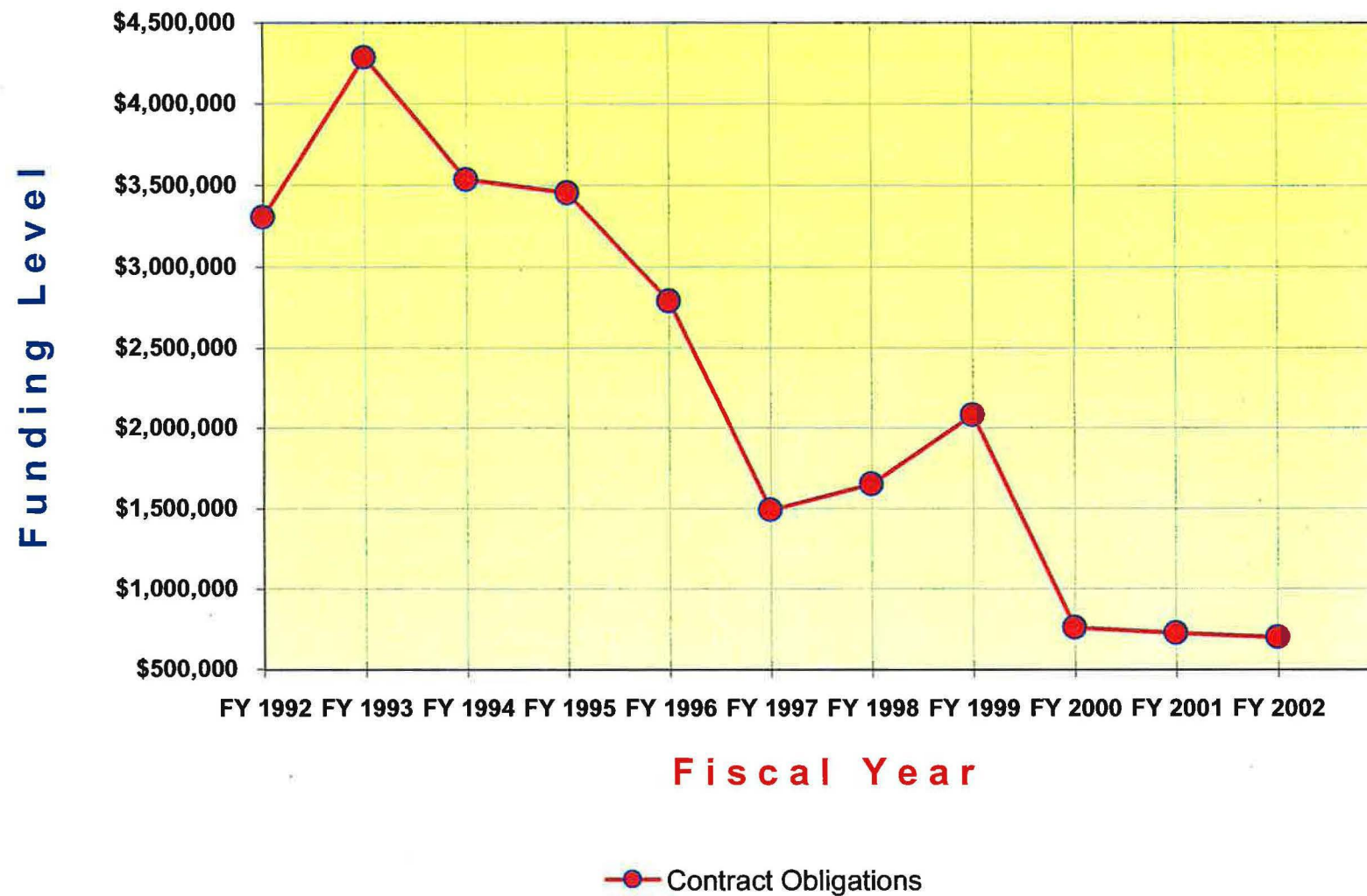
**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**

TECHNICAL SUPPORT CONTRACTS

(Status as of 03/14/01)

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Paul C. Rizzo Associates, Inc.	09/30/01	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 Engineer	09/30/01	Provide technical support to the Board, specifically in the review and evaluation of systems and seismic engineering 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 analyses performed by DOE contractors; and hazard and systems classification.
Dr. Gerald Tape	11/30/01	Provide expertise related to strategic safety issues associated with those facilities involved in the assembly, disassembly, and testing of nuclear weapons, specifically advising the Board in production, dismantlement/disposition, safe handling, testing, and storage of nuclear weapons, nuclear explosive devices, and nuclear weapon components, and the nuclear and hazardous materials used in these items; as well as assisting the Board in understanding the existing involvement of the design laboratories in these current and proposed efforts.

Outside Technical Contracts by Fiscal Year



**FISCAL YEAR 2002 PERFORMANCE PLAN
SUBMITTED UNDER THE PROVISIONS OF THE
GOVERNMENT PERFORMANCE AND RESULTS ACT**

Defense Nuclear Facilities Safety Board



OCTOBER 2000

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1. INTRODUCTION

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.

As outlined in the Board's Strategic Plan, the Board's statutory mission is logically divided along the lines established by the three general goals:

- 1. Complex-Wide Health and Safety Issues. Integrated safety management (including comprehensive health and safety requirements, technically competent personnel, and effective implementing mechanisms) continues to evolve through feedback and improvement, and is implemented in all life cycle phases—design and construction, startup, operation, and decommissioning.**
- 2. Safe Stewardship of Nuclear Weapons Stockpile and Components. Nuclear weapons stockpile support and defense nuclear research activities continue to be planned and executed safely at DOE's defense nuclear facilities.**
- 3. Safe Disposition of Hazardous Remnants of Weapons Production. Hazardous remnants of nuclear weapons production are appropriately characterized, stabilized, and stored; and legacy facilities are decommissioned in a manner that protects the worker, the public, and the environment.**

The Board's Strategic Plan establishes the framework for making management decisions, and describes what the Board plans to do each year to progress toward achievement of each of these three general goals. In planning its work, the Board and its staff have developed a set of seven strategic objectives that, in aggregate, implement the Board's general goals. The relationship between these goals and objectives is discussed in the Board's Strategic Plan.

To facilitate strategic management, the Board has organized its technical staff into three groups. The technical lead of each group is assigned responsibility for one of the three general goals in the Strategic Plan, and for executing the strategic 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 and its technical leadership have produced measurable performance goals for fiscal year (FY) 2001 and FY 2002 that, when executed, will demonstrate continued progress toward the Board's strategic objectives, and consequently toward its general goals. These annual performance goals and measures establish projected levels of performance and reflect the nature of the Board's independent oversight function.

All of the Board's general goals and objectives 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 2002 identifies annual performance goals for each strategic objective that consist of reviews to be conducted in support of each objective, plus the identification of candidate areas for these reviews. An outcome measure for each objective is described as part of the discussion of each annual performance goal. Qualitative assessments of the outcome associated with each annual performance goal are provided in 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.**
- 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 worker, or 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 experience, developed during the last 10 years of reporting progress to Congress in the Board's Annual Reports, has shown that it is possible to conduct a retrospective assessment of Board-identified issues and associated DOE responses that demonstrates that the Board has had a clear and positive impact on the safety culture within DOE.

Because of the variability of DOE's plans and schedules, some candidate areas identified in the Board's Annual Performance Plans 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.

2. FISCAL YEAR 2002 ANNUAL PERFORMANCE PLAN

2.1 GENERAL

To facilitate an integrated review, the foldout tables in this section are formatted to show the flow-through from the general goals set forth in the Board's Strategic Plan to strategic goals and objectives and specific annual performance goals for FY 2001 and FY 2002. To place this planning information in context, the tables also provide examples of the Board's related FY 1999 and FY 2000 accomplishments, as required by OMB's guidance on Performance Plans. These examples do not represent the entire scope of progress made on the FY 2000 performance goals. A comprehensive assessment of progress during calendar year (CY) 1999 appears in the Board's Tenth Annual Report. The Eleventh Annual Report, due for publication in early 2001, will cover accomplishments during CY 2000.

2.2 STRATEGIC GOAL 1: COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Continuing evolution of Integrated Safety Management (ISM) (including comprehensive health and safety requirements, technically competent personnel, and effective implementing mechanisms) through feedback and improvement, and full implementation of ISM in all life cycle phases—design and construction, startup, operation, and decommissioning.

The first goal addresses the agency's efforts to facilitate the complex-wide implementation of integrated safety management throughout the DOE defense nuclear complex. Achieving that goal requires a multi-year, multi-site, multi-focus effort. The three strategic objectives that support that general goal encompass a broad spectrum of technical areas relevant to the safety of DOE's defense nuclear mission.

Strategic Objective 1–A: Improvement and Integration of Health and Safety Directives. The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.

Strategic Objective 1–B: Technical Competence. The Board and its staff 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.

Strategic Objective 1–C: Complex-Wide Implementation of Integrated Safety Management in Facility Design, Operation, and Post-Operation. The Board and its staff will verify the effective and expeditious development and implementation of DOE's ISM program.

Table 2-1(a) - Accomplishments Regarding Strategic Objective 1-A

Objective 1–A: <u>Improvement and Integration of Health and Safety Directives.</u> The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.	
Examples of FY 1999 Accomplishments	Examples of FY 2000 Accomplishments
<p>The Board and its staff provided substantive comments to DOE during the review process for three health and safety directives associated with deactivation and decommissioning. After successfully resolving the Board’s comments, DOE updated one of these directives. At years end, both staffs were completing resolution of issues in the two remaining directives to improve content, clarity, and consistency of the guidance.</p> <p>The Board’s staff provided comments on thirteen draft implementation guides associated with 10 CFR 835, <i>Occupational Radiation Protection</i>, DOE-STD-1098-99, <i>Radiological Control Standard</i>, and two handbooks associated with the DOE radiological protection program. The staff then worked with the DOE staff to resolve the identified areas of needed improvement. By year’s end, DOE had issued all thirteen implementation guides and both handbooks, and had sent the standard to the DOE Technical Standards Program for publication. These actions resulted in clarifying and strengthening DOE’s guidance for this important safety management function.</p> <p>The Board provided comments to DOE on a new guide on management of Quality Assurance, a new qualification standard for individuals engaged in criticality safety studies, and a new handbook addressing design considerations, all three of which are explicitly associated with integrated safety management. Through significant interaction between the Board’s staff and their DOE counterparts, significant improvements in the content and clarity of the directives were achieved.</p>	<p>The Board and its staff provided substantive comments to DOE during the review process for 44 directives associated with, but not limited to, integrated safety management, chemical safety, nuclear explosive operations, and technical personnel training and qualification. At year’s end, both staffs were completing resolution of issues on several remaining directives to improve the content, clarity, and consistency in safety guidance.</p> <p>The Board and its staff provided comments to DOE during the review process on the draft <i>Chemical Management Handbook</i>. The preliminary draft was unacceptable, lacking proper integration with integrated safety management concepts. As a result of suggestions from the Board’s staff, the rewritten handbook incorporates integrated safety management, the applicable DOE standards, and other government agency regulations to allow ease of contractor use.</p> <p>Following the issuance of DOE-DP-STD-3016-99, <i>Limited Standard, Hazard Analysis Reports for Nuclear Explosive Operations</i>, the Board’s staff interacted directly with the Pantex contractor in preparing an Authorization Basis Manual that described in more detail the format and content of the Hazard Analysis Report, as well as the analytical process, in preparation for nuclear explosive operations. This will significantly improve the quality of the authorization basis for nuclear explosive operations including clear identification of the necessary safety controls.</p> <p>Working closely with the Board and its staff, DOE has upgraded DOE Order 360.1A, <i>Federal Employee Training</i>, and DOE-STD-1063-2000, <i>Facility Representatives</i>, as elements of the revised Implementation Plan for Board Recommendation 93-3, <i>Improving DOE Technical Capability in Defense Nuclear Facilities Programs</i>. DOE has further institutionalized its technical personnel processes with the issuance of DOE M 426.1-1, <i>Federal Technical Capability Manual</i>.</p> <p>During 2000, DOE G 450.4-1, <i>Integrated Safety Management Guide</i> was revised to incorporate a major new section dealing with how to maintain a site’s Integrated Safety Management system following initial implementation. Significant involvement of the Board and its staff was key to the development of the approach as well as the revision to DOE G 450.4-1. This new guidance will help to ensure the sites’ ISM systems are maintained current and continue to improve.</p>

Table 2-1(b) - Performance Goals Regarding Strategic Objective 1-A

Objective 1–A: Improvement and Integration of Health and Safety Directives. The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.

FY 2001 Performance Goals	FY 2002 Performance Goals
<p>The Board and its staff will continue to review and assess the adequacy of health and safety requirements in new directives and rules, as well as in specific DOE directives that may be revised as a result of DOE's two-year review cycle. Results will be communicated to DOE by the Board or its staff for incorporation or resolution, as appropriate.</p> <p>Based on past experience and an anticipated modest decrease in the number of new directives, it is estimated that DOE will issue a minimum of 34 directives for review by the Board and its staff in FY 2001. Based on experience from FY 1999 and FY 2000, it is expected that approximately three of these reviews will be of major significance, and, as such, will require substantial Board and staff interaction with DOE to satisfactorily resolve identified issues prior to finalization.</p> <p>The Board will place particular emphasis on encouraging DOE to develop necessary new directives and to improve, consolidate, and integrate existing directives and rules related to health and safety in the following areas:</p> <ul style="list-style-type: none">• Effective conduct of hazardous facility, site and complex-wide projects and programs, including roles, responsibilities, competencies, mechanisms, and training;• Sound safety management and systems engineering throughout the complete facility life cycle; and• Adequate performance measures for determining effectiveness of site integrated safety management programs. <p>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.</p>	<p>The Board and its staff will continue to review and assess the adequacy of health and safety requirements in new directives and rules, as well as in specific DOE directives that may be revised as a result of DOE's two-year review cycle. Results will be communicated to DOE by the Board or its staff for incorporation or resolution, as appropriate.</p> <p>It is estimated that DOE will issue a minimum of 36 directives for review by the Board and its staff in FY 2002. Approximately 3 of these reviews are expected to be of major significance, requiring substantial Board and staff interaction with DOE to satisfactorily resolve identified issues prior to finalization.</p> <p>The Board will continue to encourage DOE to develop necessary new directives and to improve, consolidate, and integrate existing requirements and guidance related to health and safety, especially those directives and rules aimed at the integration of safety management throughout the entire life cycle of major projects. In this regard, the Board intends to pay particular attention to how DOE articulates its requirements and guidance applicable to new capital acquisitions and complex-wide programs involving multiple program offices, especially in the following areas:</p> <ul style="list-style-type: none">• Effective conduct of hazardous facility, site and complex-wide projects and programs, including roles, responsibilities, competencies, mechanisms, and training; and• Safety and hazard analyses. <p>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.</p>

Table 2-2(a) - Accomplishments Regarding Strategic Objective 1-B

Objective 1-B: <u>Technical Competence.</u> The Board and its staff 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.	
Examples of FY 1999 Accomplishments	Examples of FY 2000 Accomplishments
<p>The Board continued to focus DOE’s attention on the technical competence of federal workers as an essential safety element for defense nuclear facilities. Through a revised Implementation Plan for Board Recommendation 93-3, <i>Improving DOE Technical Capability in Defense Nuclear Facilities Programs</i>, DOE formed a panel of senior line managers to ensure successful implementation of a corporate program to recruit, develop, deploy, and retain technical capability at defense nuclear facilities. The panel members self-assessed the Technical Qualification Programs at their respective sites, and took the necessary actions to upgrade their plans and procedures. The panel also identified 686 critical technical positions and took administrative actions to preserve nearly all of these positions against any future downsizing.</p> <p>Significant accomplishments were made by DOE as a result of implementing Board Recommendation 97-2, <i>Criticality Safety</i>. Training and qualification programs for both DOE and contractor criticality engineers were established including high quality qualification standards. The operation of the Los Alamos National Laboratory critical facility was revamped for training of criticality safety engineers and for the development of intermediate range neutron energy data for critical assemblies. These activities provide vital information for understanding and characterizing the unique hazards and for developing proper safety controls related to nuclear criticality. Additionally, a web-site was developed for dissemination of archived data on the past 40 years of criticality experiments which will provide great benefit to the nuclear safety community.</p>	<p>The Board continued to focus DOE’s attention on the technical competence of federal workers as an essential safety element for defense nuclear facilities. Through a revised Implementation Plan for Board Recommendation 93-3, <i>Improving DOE Technical Capability in Defense Nuclear Facilities Programs</i>, DOE formed a panel of senior line managers to implement a corporate program to recruit, develop, deploy, and retain technical capability at defense nuclear facilities. Many changes in DOE’s mission and infrastructure have occurred since the Board issued Recommendation 93-3. The Board believes that DOE’s efforts in response to this recommendation have resulted in excellent programs and processes that will be invaluable in the training and qualification of the next generation of the DOE federal workforce. On November 9, 1999, the Board closed Recommendation 93-3.</p> <p>The Board and its staff have continued to engage DOE in regard to the development of formal training and qualification for federal and contractor criticality safety personnel resulting in the upgrade of DOE Order 420.1, <i>Facility Safety</i> emphasizing this important aspect of criticality safety. Also, in response to Board staff concerns about the floor presence of criticality engineers, DOE has directed that criticality engineers increase the number of hours spent observing work on the floor, and report these hours to headquarters and program offices responsible for the site.</p> <p>The Board and its staff have continued to interact directly with cognizant DOE representatives to ensure a satisfactory path to closure of Board Recommendation 97-2, <i>Continuation of Criticality Safety</i>, especially with regard to the development of an adequate curriculum and the criticality safety training of sufficient numbers of contractor and federal employees.</p> <p>The Board will continue to emphasize the vital importance that a technically-competent workforce plays in ensuring public and worker health and safety.</p>

Table 2-2(b)- Performance Goals Regarding Strategic Objective 1-B

Objective 1-B: <u>Technical Competence.</u> The Board and its staff will verify that roles, responsibilities, experience, and competencies required to protect the workers and the public are explicitly defined and implemented for both DOE and its contractor personnel.	
FY 2001 Performance Goals	FY 2002 Performance Goals
<p>The Board and its staff will conduct the following type of assessments:</p> <ul style="list-style-type: none">• Review the status of implementation and institutionalization of the Federal Technical Capability Program at the DOE site level.• Assess the implementation of the system engineers program in the Federal and contractor work force, in accordance with DOE's Implementation Plan for Board Recommendation 2000-2, <i>Configuration Management of Vital Safety Systems</i>.• Assess whether competence is commensurate with assigned responsibilities for key safety management personnel at defense nuclear contractor organizations as part of scheduled DOE and contractor readiness determinations.• Evaluate on the site level DOE's 5-year plan for maintaining a viable criticality safety infrastructure to ensure that they address the concerns identified in the FY 2000 complex-wide criticality safety reviews by the Board's staff and DOE-EH, that included increasing the field presence of federal criticality safety personnel and improving the formality and rigor of DOE oversight efforts.• Assess DOE's plan to develop and implement a project manager qualification program, including its level of technical rigor. <p>Results of assessments will be communicated to DOE to enhance understanding of safety-related roles and responsibilities in support of DOE's execution of functions associated with protecting the worker and the public, and to be used by DOE to upgrade the quality of its technical workforce.</p>	<p>The Board and its staff will conduct the following type of assessments:</p> <ul style="list-style-type: none">• Review and evaluate the effectiveness of the system engineers program in the Federal and contractor work force, in accordance with DOE's Implementation Plan for Board Recommendation 2000-2, <i>Configuration Management of Vital Safety Systems</i>.• Assess whether competence is commensurate with assigned responsibilities for key safety management personnel at defense nuclear contractor organizations as part of scheduled DOE and contractor readiness determinations.• Assess the degree to which DOE and its contractors have implemented measures to ensure a viable criticality safety infrastructure, including progress toward qualification of contractor criticality safety engineers, through DOE site reviews.• Assess the effectiveness of DOE's project manager qualification program at DOE headquarters office and DOE sites, including its depth and level of technical rigor. <p>Results of assessments will be communicated to DOE to enhance understanding of safety-related roles and responsibilities in support of DOE's execution of functions associated with protecting the worker and the public, and to be used by DOE to upgrade the quality of its technical workforce.</p>

Table 2-3(a) - Accomplishments Regarding Strategic Objective 1-C

Objective 1-C: **Complex-Wide Implementation of Integrated Safety Management in Facility Design, Operation, and Post-Operation.** The Board and its staff will verify the effective and expeditious development and implementation of DOE's integrated safety management (ISM) program.

Examples of FY 1999 Accomplishments	Examples of FY 2000 Accomplishments
<p>Reviews by the Board and its staff identified shortcomings in the Hanford Spent Nuclear Fuel Project that included the continued lack of sound project management, despite several high level management changes; poor implementation of quality assurance requirements; and an inability to identify and resolve emerging technical issues in a timely manner. Continued Board and staff pressure through correspondence and face-to-face meetings has led to some progress on these concerns, but continuing attention is needed.</p> <p>Several key indicators for gauging progress in implementing ISM have been identified from the Board's reviews: Incorporation of ISM-related DEAR clauses into contracts, establishment of a mutually agreed-upon requirements base as the foundation for the ISM program, development of an ISM System description that describes how the contractor will integrate the system into work practices, performance of a DOE ISM verification review, and establishment of an authorization agreement. Each of these areas received Board attention in FY1999, not only at the 10 priority facilities called out in the Recommendation 95-2 DOE Implementation Plan but also in the 43 facilities designated in the Board's December 1997 letter as "follow-on" facilities. During the FY1999, DOE has worked to fully implement ISM at the Recommendation 95-2 priority facilities. The Board monitored and advised on the development of DEAR Clause-required ISM descriptions, which describe how the contractor will integrate ISM into work practices. To date, all sites with priority or follow-on facilities have had their ISM descriptions approved by DOE, except Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and the Pantex Plant, which are scheduled for approval by the end of the year. The Board also urged DOE to continue its efforts to define and operate to explicit control measures at the priority facilities, and enlarge its efforts to include all high and moderate hazard defense nuclear facilities. In his March 1999, memorandum on Safety-Accountability and Performance, the Secretary of Energy committed to having ISM completely in place for all DOE facilities by September 2000.</p> <p>In response to the Board's March 20, 1998, reporting requirement on the DOE's Feedback and Improvement program, DOE committed to upgrading the DOE Lessons Learned process, including developing guidance on improving the complex-wide feedback and improvement programs. In addition, DOE recently published a revised DOE acquisition regulation that will hold a contractor's fee at risk in the event of poor safety performance. The Secretary of Energy's March 3, 1999, memorandum on Safety-Accountability and Performance tasked the newly established DOE Safety Council with developing performance standards that will be used to hold Federal personnel accountable for effective and timely ISM implementation. The Board is continuing to work closely with DOE in this effort.</p> <p>The Board issued Recommendation 98-1 to address the internal independent oversight element of the feedback and improvement program that the Board felt was not being adequately addressed in DOE's feedback and improvement initiatives. The Board determined that DOE's independent assessments of safety management in the field were treated largely as advisories and follow-up actions became discretionary to lower levels of DOE line management. DOE accepted this Recommendation and provided an acceptable Implementation Plan, which addresses DOE's need for a clearly defined, systematic, and comprehensive process to address and resolve safety issues identified by internal independent oversight.</p>	<p>Review of the preliminary design package for the Tritium Extraction Facility (TEF) project by the Board and its staff disclosed that the preliminary design did not appear to have fully implemented the hierarchy of safety controls consistent with the site's manuals of practice, and that additional consideration of this matter was merited in developing the final TEF design. For example, there appeared to be an over-reliance on administrative controls being used instead of engineered design features to provide safety functions. DOE accepted the Board's suggestions and agreed to incorporate them in the final design.</p> <p>Reviews of the Hanford Spent Nuclear Fuel Project by the Board's staff identified safety issues related to safety-related ventilation systems and electrical systems at the Cold Vacuum Drying Facility. DOE has addressed these issues, including addition of a diesel generator to supply safety significant power to the exhaust fans for the ventilation system, further enhancing the safety of the facility.</p> <p>The Board and its staff conducted a series of review meetings on the design of the Pit Disassembly and Conversion Facility (PDCF) that identified to DOE a need for additional boreholes in the geotechnical specification to improve safety; DOE added a requirement for these boreholes to the specification. In addition, the Board noted that sand filters provide better inherent resistance to severe accidents than do high efficiency particulate air (HEPA) filters. In response, DOE committed to conduct a comprehensive study to compare the safety and cost benefits of the sand filter option with the HEPA filtration option.</p> <p>The Board prepared and issued DNFSB/TECH-27 <i>Fire Protection at Defense Nuclear Facilities</i>, setting forth principles and good practices for enhancing the reliability of DOE's complex-wide fire protection program.</p> <p>The Board's staff review of DOE's Y2K Program identified issues related to the evaluation of the safety related systems for year 2000 compliance. Programmatic issues at Los Alamos and Lawrence Livermore National Laboratories remained until the fall of 1999 and required subsequent staff followup in late 1999. Following the improvement in DOE's Y2K program, there were no significant failures of safety-related systems at the calendar year turnover.</p> <p>In response to numerous letters from the Board associated with Integrated Safety Management, DOE upgraded its Lessons Learned process, including issuing new guidance documents and development of a centralized web-based Lesson Learned database. DOE also issued a set of ISM performance indicators to provide senior DOE managers with measures of the effectiveness of ISM at their sites.</p> <p>In response to Board Recommendation 98-1 <i>Resolution of DOE Internal Oversight Findings</i>, DOE implemented a formal process for dealing with safety issues identified by DOE's internal independent oversight organization. This has resulted in a clearly defined, systematic, and comprehensive process for addressing and resolving these safety issues.</p> <p>The Board's staff continued to critique all ISM verifications at defense nuclear facilities. These verification reviews are the processes DOE uses to evaluate the status of ISM implementation and are key to the DOE Field Managers' determinations that their sites have implemented ISM. Additional criteria for determining ISM implementation were issued by the Deputy Secretary in October 1999. The Board worked closely with DOE in defining these criteria and in evaluating DOE's efforts to implement ISM at all sites.</p>

Table 2-3(b) - Performance Goals Regarding Strategic Objective 1-C

Objective 1-C: <u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Operation, and Post-Operation.</u> The Board and its staff will verify the effective and expeditious development and implementation of DOE's integrated safety management (ISM) program.	
FY 2001 Performance Goals	FY 2002 Performance Goals
<p>The Board and its staff will conduct reviews of DOE's efforts to implement ISM throughout all facility life cycle phases. Candidates for review include:</p> <ul style="list-style-type: none"> • Tritium Extraction Facility at the Savannah River Site. Assess detailed process hazards studies, the quality assurance program for equipment procurement and facility construction, and a detailed structural review of the facility design prior to initiation of construction. • Pit Disassembly and Conversion Facility at Savannah River Site. Evaluate the adequacy of, and identify major safety issues associated with trade studies, Title I design, and preliminary hazards analysis. • Hanford Spent Nuclear Fuel project. Assess hazards studies and safety analysis reports, construction, equipment operational testing, procedures, and operator training. • Other DOE design/construction activities. Assess the safety management, criteria development, design development, and construction. Reviews will be based on relative hazards, and on DOE's schedule and progress on candidate facilities (e.g., Tritium Consolidation Project, Highly Enriched Uranium Material Facility, and Waste Treatment Plant). • The quality and effectiveness of at least one ISM review by the DOE Office of Oversight, and at least two annual DOE ISM reviews (one EM site and one NNSA site). • Activity-level ISM implementation at sites with higher than expected rates of occurrences related to worker protection. • Authorization Agreements for Pantex Plant weapons activities, as well as selected Authorization Agreements for other defense nuclear facilities and activities. • Authorization basis documents at two defense nuclear sites to ensure hazards are adequately identified and controls are in place to prevent unwanted events, as well as to ensure hazard assessments are integrated with emergency management activities. <p>As a result of these reviews, DOE will provide adequate approaches and schedules for resolution of identified issues at new or modified defense nuclear facilities.</p>	<p>The Board and its staff will conduct reviews of DOE's efforts to implement ISM throughout all facility life cycle phases, as well as efforts to make ISM more effective. Candidates for review include:</p> <ul style="list-style-type: none"> • Tritium Extraction Facility at the Savannah River Site. Assess the implementation of quality assurance requirements during facility construction and the procurement of safety significant facility equipment. • Pit Disassembly and Conversion Facility at the Savannah River Site. Evaluate the adequacy of DOE's review of Title I/II design, and resolution of significant design safety issues. • Hanford Spent Nuclear Fuel project. Assess DOE reviews of operations for fuel removal and storage from K-West Basin and review of safety analyses, construction, and operational testing in preparation for fuel removal from K-East Basins in December 2002. • Other DOE design/construction activities. Reviews will be based on relative hazards, and on DOE's schedule and progress on candidate facilities (e.g., Tritium Consolidation Project, Highly Enriched Uranium Material Facility, and Waste Treatment Plant). • The quality and effectiveness of at least one ISM review by the DOE Office of Oversight, and the implementation of line oversight of ISM per DOE P 450.5 at one EM site and one NNSA site. • Activity-level ISM implementation at sites with higher than expected rates of occurrences related to worker protection. • The quality of authorization basis documents at two defense nuclear sites to ensure hazards are adequately identified and controls are in place to prevent unwanted events, as well as to ensure hazard assessments are integrated with the emergency management activities for better mitigation of potential accidents. <p>As a result of these reviews, DOE will provide an adequate approach and schedule for resolution of identified issues that supports safe start-up and operation of new or modified defense nuclear facilities.</p>

2.3 STRATEGIC GOAL 2: SAFE STEWARDSHIP OF NUCLEAR WEAPONS STOCKPILE AND COMPONENTS

Continued safe execution of nuclear weapons stockpile support and defense nuclear research activities at DOE's defense nuclear facilities.

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

Strategic Objective 2–A: Safe Conduct of Stockpile Management. The Board and its staff will verify the safety of DOE's defense nuclear facilities and activities relating to the maintenance, storage, and dismantlement of the nuclear weapons stockpile.

Strategic Goal 2–B: Safe Conduct of Stockpile Stewardship. The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapons stockpile in the absence of underground nuclear testing.

Table 2-4(a) - Accomplishments Regarding Strategic Objective 2-A

Objective 2-A:	Safe Conduct of Stockpile Management. The Board and its staff will verify the safety of DOE’s defense nuclear facilities and activities relating to the maintenance, storage, and dismantlement of the nuclear weapon stockpile.	
Examples of FY 1999 Accomplishments		Examples of FY 2000 Accomplishments
<p>DOE Standard on Hazards Analysis Reports: In early 1999, in response to a Board Recommendation, DOE developed and published a standard on conducting and documenting hazards analyses for nuclear explosive operations. This important directive sets DOE’s fundamental expectations and provides guidance on how to establish and document the safety basis that ensures hazardous activities involving nuclear explosives can be completed safely.</p> <p>Lightning Protection at Pantex: The Board and its staff continued efforts during the last year to help DOE address the potential hazards from lightning to nuclear explosive operations at Pantex. This year, the DOE lightning protection project team (which was established in response to a Board reporting requirement) completed a comprehensive investigation and report detailing the threat of lighting to nuclear explosives, analyzing potential controls and mitigators, and summarizing the actions DOE considers necessary to protect nuclear explosive operations at Pantex from lightning threats. During this same time, DOE has identified and installed many additional lightning protective measures at the plant.</p> <p>Chemical Safety: Based on evaluations from its staff, the Board concluded that efforts to improve chemical safety at the Oak Ridge Y-12 Plant were not keeping pace with other defense nuclear sites or the Secretary of Energy’s published expectations. After the Board communicated its concern, DOE has stepped up efforts to complete a chemical management program at Oak Ridge Y-12, including a renewed commitment to characterize chemical inventories for emergency planning purposes and to dispose of excess chemicals.</p> <p>Safety Controls for Specific Nuclear Explosive Operations: The Board and its staff conducted numerous assessments of the safety of specific nuclear explosive activities at the Pantex Plant in the last year. These reviews, which included the W56 dismantlement, the W87 Life Extension Program, and the W62 surveillance program, identified safety-related issues such as the adequacy of safety analyses and controls, the flowdown of controls into operating-level procedures, and the readiness of activities to operate safely. As a result of the Board’s involvement, DOE has taken positive action to improve the safety of all of these operations.</p> <p>Integrated Safety Management at Pantex: In early FY1999, the Board issued Recommendation 98-2, <i>Integrated Safety Management at the Pantex Plant</i> urging DOE to take fundamental actions to improve the safety of all weapons-related work at the Pantex Plant. Principle among the Board’s specific recommendations was that DOE simplify and expedite its process for re-engineering processes at Pantex such that the attendant safety improvements could be put in place sooner. DOE accepted Recommendation 98-2 and made specific commitments to improve safety management at Pantex including accelerating efforts to establish weapon-specific safety basis for all on-going activities at Pantex.</p> <p>Enriched Uranium Restart at Y-12: The Board and its staff have been evaluating DOE efforts to resume enriched uranium operations at the Oak Ridge Y-12 Plant for several years. In the last year, the Board has identified and passed on to DOE several safety issues with the Phase A2 resumption project including design problems, safety analysis problems, and problems with implementation of safety controls. The Board and DOE worked cooperatively to resolve these issues such that Phase A2 operations could resume safely to support high priority national defense related missions.</p>		<p>Pit Storage and Repackaging: Currently, the vast majority of plutonium pits at the Pantex Plant are in inadequate storage configurations. In response to the Board’s Recommendation 99-1, <i>Safe Storage of Fissionable Material called "Pits,"</i> DOE has started a major effort to repackage all pits into improved storage containers and execute a surveillance plan to ensure that pits in storage remain in a safe environment.</p> <p>Y-12 Plant Safety Basis: As a result of staff reviews and several letters from the Board, personnel at the Y-12 Plant have revised the implementation plan for upgrades to the safety bases for their nuclear facilities. This upgrade program will lead to better identification of hazards and necessary controls for prevention and mitigation of potential accidents. This effort will also lead to implementation of the intent of an Integrated Safety Management program at the related facilities in a more effective manner.</p> <p>W62 Disassembly & Inspection Restart: As a result of the Board’s and its staff’s focused involvement in the reauthorization of Disassembly and Inspection (D&I) operations for the W62 nuclear warhead, DOE improved safety of the operation by upgrading the tooling and procedures used for the job. This effort, which was prompted by the Board’s Recommendation 98-2, <i>Integrated Safety Management at the Pantex Plant</i>, also resulted in a substantial improvement in the technical rigor and thoroughness of the Nuclear Explosive Safety Study Revalidation process. In addition, the experience that DOE and its contractors gained during this effort has resulted in an improved process for hazards analysis at Pantex for other nuclear explosive operations, and the execution of that process has improved noticeably as a result of the progress made during the W62 D&I restart activities.</p> <p>Pantex Fire Protection: The Board and its staff highlighted to DOE senior management that the fire detection system at Pantex was failing because the commercial vendor had stopped producing spare parts. The review also identified that the fire suppression capability of the cells in Building 12-44 lagged that in other nuclear explosive operating facilities because they did not have ultra-violet detectors to initiate suppression. As a result of the Board’s actions, a major part of the supplemental appropriation from DOE to Pantex will be used to install a UV detection system to activate the deluge system in the cells, greatly improving the fire safety of explosive operations in the area. Additionally, DOE has started plans (in response to Recommendation 98-2) to accelerate replacement of the fire detection system with a non-proprietary system supported by many different commercial vendors.</p> <p>Canned Subassemblies: Comparing safety analyses from the Pantex Plant and Y-12 Plant, the Board’s staff noted that the analyses at Pantex did not consider the potential damage resulting from exposure of canned subassemblies (CSAs – the fusion portion of a nuclear weapon) to fires. Further research by the staff on the properties of the materials making up the Los Alamos-designed CSAs indicated a significant hazard at Pantex that was not considered by the site or the Design Agency. Working with safety basis and other engineering personnel from all three sites, the staff assisted in the development of a predictive model of behavior for these components. The response of CSAs to fires were then compared to the response of high explosives (HE) and controls were enhanced to ensure that they were adequate to protect the CSAs.</p>

Table 2-4(b) - Performance Goals Regarding Strategic Objective 2-A

Objective 2–A: Safe Conduct of Stockpile Management. The Board and its staff will verify the safety of DOE’s defense nuclear facilities and activities relating to the maintenance, storage, and dismantlement of the nuclear weapon stockpile.	
FY 2001 Performance Goals	FY 2002 Performance Goals
<p>The Board and staff will conduct assessments of DOE’s efforts to develop and implement safety management systems for stockpile management activities. The Board will review safety system development (e.g., system and process designs, safety bases, control schemes, and administrative programs) and safety management system implementation. These reviews will focus on activities at the Pantex Plant, Y-12 Plant, and SRS tritium activities.</p> <p>Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none">• Weapon Safety Specifications and/or Hazard Analysis Reports for nuclear weapon activities (e.g., W88).• Safety basis analysis for nuclear weapons activities or facilities (e.g., fire protection facility safety analysis upgrade).• Cross-cutting functional areas at the Pantex Plant, Y-12 Plant, or SRS tritium facilities (e.g., radiation control, chemical safety).• DOE/contractor operational readiness reviews or other readiness determinations (e.g., W88).• Special studies of unique or significant hazards at a DOE weapons facilities (e.g., hazards of special materials in weapons). <p>In addition, the Board and staff will assess the adequacy of development and implementation of the ISM System and the safety controls identified for any new weapon system dismantlement projects (such as the W56) at the Pantex Plant or Y-12 Plant that start in FY 2001.</p>	<p>The Board and 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 Plant, and SRS tritium activities.</p> <p>Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none">• Site-wide and facility-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., safety analysis reports).• Weapon-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., B83).• Nuclear explosive safety studies (e.g., W80).• Cross-cutting functional areas at the Pantex Plant, Y-12 Plant, or SRS tritium facilities (nuclear criticality safety, fire protection, nuclear explosive safety).• Special studies of unique or significant hazards at a DOE weapons facilities (e.g., process technology alternatives). <p>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 or Y-12 Plants that start in FY 2002.</p>

Table 2-5(a) - Accomplishments Regarding Strategic Objective 2-B

Objective 2-B: Safe Conduct of Stockpile Stewardship. The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.	
Examples of FY1999 Accomplishments	Examples of FY 2000 Accomplishments
<p>B332 Restart: After a Board letter in December 1997 identifying weaknesses in work planning, authorization and control in Building 332, Plutonium Facility, the Board interacted with Lawrence Livermore National Laboratory and the Department of Energy throughout Building 332's Resumption of Operations in 1998 and 1999 to encourage and assist with the improvements. As a result, Building 332 has implemented a process to plan, authorize and control work with special nuclear material safety. With the Board's encouragement the process has been applied to the other facilities in the Superblock, i.e., Tritium Facility and Hardened Engineering Test Building. The Laboratory is revising site implementing guidance on planning, authorizing and control work to address a laboratory-wide systemic problem.</p> <p>Integrated Safety Management at LLNL: As a result of the Board's effort to improve safety management at DOE defense nuclear facilities (Recommendation 95-2), LLNL has developed a set of Work Smart Standards (a set of requirements and standards for hazards specifically applicable to LLNL), is making significant progress with developing a description of its integrated safety management system, and is developing site-wide standards/guidance to implement an integrated safety management system. Through direct Board interaction, Board letters, and Board staff visits and reviews, the Board has provided assistance with and feedback to the Work Smart Standards set and to the Laboratory's efforts to develop policy and guidance to implement integrated safety management.</p> <p>Y2K: Based on staff reviews at Lawrence Livermore National Laboratory and other sites, the Board determined the DOE had provided inadequate direction to the operators of its defense nuclear facilities with regard to evaluating safety-related systems for year 2000 compliance. The Board communicated its concern to DOE in a letter requesting that DOE report on the status of safety-related equipment evaluations at all defense nuclear facilities. In April 1999, DOE issued detailed guidance on the evaluation of safety-related systems, requiring those systems be treated in a manner similar to mission-essential systems.</p> <p>Los Alamos National Laboratory Pajarito Laboratory: The Board and its staff identified deficiencies with the safety basis for activities conducted at the Pajarito Laboratory (also known as TA-18 which includes the Los Alamos Critical Experiments Facility). The Board assisted DOE and the lab in defining a path to improve the safety basis including urging that DOE focus on Basis for Interim Operations to upgrade the safety controls at Pajarito Laboratory as soon as possible.</p> <p>Damaged Nuclear Weapons: The Board has recently focused attention on the issue that DOE's capability to safely perform the work necessary to dispose of damaged nuclear devices (DNDs) at defense nuclear facilities is rapidly disappearing. In the past, maintenance of the facilities and personnel necessary to support this mission depended on nuclear test operations. However, the personnel and facility infrastructure that were required to support testing operations are rapidly disappearing. Planning DND operations so that they can be executed safely represents challenges that DOE is not addressing. DOE has agreed with the Board's conclusions and is starting to increase its efforts to address this issue.</p>	<p>LLNL Electrical and I&C: Based on reviews by the Board's staff of LLNL's electrical, instrumentation, and control systems, the Board concluded that the safety-class emergency power system at LLNL's plutonium facility (Building 332) is neither designed nor maintained to safety-class standards. The staff report also noted potential areas for improvement, particularly LLNL's Work Smart Standards for safety-related instrumentation and control systems and lightning protection for Building 332. In response, LLNL has taken prompt actions to address the Board's issues such as correcting improper seismic mounts for safety-critical electrical components and switchgear.</p> <p>LANL Authorization Basis (AB) Documents: The Board noted significant deficiencies in the quality of some AB documents at LANL and urged DOE and the laboratory to take decisive corrective actions. As a result of highlighting these issues, LANL, under strong guidance from LAAO, performed a thorough self-assessment of the quality of AB documentation. LANL found that the documentation for most of the facilities reviewed had significant deficiencies. LANL, under guidance from LAAO, agreed contractually to upgrade the quality of the documentation involved. LANL has also reorganized to improve its ability to assure the quality of ABs. The LANL self-assessment, which was consistent with requirements for ISM self-assessments, is a model for the complex as a whole.</p> <p>LANL Response to Cerro Grande Fire and Potential for Flooding: After firefighters began to control the Cerro Grande fire, the Board conducted on-site reviews of the status of defense nuclear facilities and LANL's facility recovery plans. The defense nuclear facilities incurred little or no significant damage, and facility recovery plans were found to be thorough. The Board also reviewed the potential for flooding as a result of the loss of the ability of soil to absorb water. LANL responded swiftly to the threat of flooding with flood control and mitigation measures. The Board, however, identified important areas where DOE needed to be more thoroughly engaged in reviewing the adequacy and appropriateness of measures being taken immediately and in the future to address flooding concerns.</p> <p>LLNL Safety Basis Improvement: Extensive Board and staff reviews of LLNL's authorization basis for defense nuclear facilities have focused the Oakland Operations Office's attention towards nuclear safety and enhanced technical competence and the degree of involvement in the safety basis at LLNL. In response to the Board's reviews, there has been a substantial and continuing improvement of the LLNL Safety Basis program, including improvements in technical competence, training, and quality of safety basis documents.</p> <p>Readiness to Dispose of a Damaged Nuclear Weapon at the Nevada Test Site: The Board highlighted to DOE that there are safety-related program and infrastructure problems that may complicate DOE's mission to safely dispose of a damaged nuclear weapon or improvised nuclear devise. In response, DOE has developed a project to upgrade its capabilities to conduct these activities safely. DOE has conducted a number of exercises that clearly identified issues needing to be addressed. The drills and exercises have already improved DOE's proficiency in this important mission area. With the Board's continued oversight DOE is now prioritizing its infrastructure upgrade needs.</p> <p>LANL Classified Experiment: Board interactions with LANL have led to the formation of a group of experts to thoroughly review a classified experiment with potentially significant safety consequences and are significantly improving the quality of safety controls. The expert panel has been conscientiously evaluating the complicated activity and has identified numerous improvements that LANL has implemented (or is working on) that substantially improve the safety of this experiment and the design and safety basis for similar experiments potentially conducted in the future.</p>

Table 2-5(b) - Performance Goals Regarding Strategic Objective 2-B

Objective 2-B:	Safe Conduct of Stockpile Stewardship. The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.	
FY 2001 Performance Goals		FY 2002 Performance Goals
<p>The Board and its staff will conduct assessments of DOE's efforts to develop and implement safety management systems for stockpile stewardship activities. The Board will review safety system development (e.g., system and process designs, safety bases, control schemes, and administrative programs) and safety management system implementation. The Board will also cover DOE's efforts to address safety issues of aging-related changes in nuclear weapons components, including research and modeling. These reviews will focus on activities at LLNL, LANL, Nevada Test Site (NTS), and Sandia National Laboratory (SNL). Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none">• The safety basis analysis and change control for nuclear weapons activities or facilities, e.g., pit production.• Safety controls selected for hazardous weapons complex activities.• Cross-cutting functional areas at LANL, LLNL, NTS, and SNL.• ISM work-planning process (i.e., activity-specific hazard analysis, controls identification, and implementation of safety controls), e.g., work-planning at TA-55.• DOE/contractor operational readiness reviews or other readiness determinations, e.g., implementation of new safety controls.• Aging-related changes in nuclear weapons components for weapon systems in the enduring stockpile.		<p>The Board and its staff will conduct assessments of DOE's efforts to develop and implement safety management systems for stockpile stewardship activities. The Board will also cover DOE's efforts to address safety issues of aging-related changes in nuclear weapons components, including research and modeling, for weapon systems and components in the enduring stockpile. These reviews will focus on activities at LLNL, LANL, NTS, and SNL. Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none">• The safety basis analysis for defense nuclear activities or facilities.• Work-planning process (i.e., activity-specific hazard analysis, controls identification, and implementation of safety controls).• DOE/contractor operational readiness reviews or other readiness determinations.• Design and construction phases of the life-cycle of defense nuclear facilities, e.g., replacement for the Los Alamos Critical Experiments Facility.• Aging-related changes in nuclear weapons components for weapon systems in the enduring stockpile.• Safety controls selected for hazardous weapons complex activities.• Cross-cutting functional areas at LANL, LLNL, NTS, and SNL. <p>While performing the above reviews, the Board and its staff will assess the effectiveness of ISM implementation for proposed and on-going operations.</p>

2.4 STRATEGIC GOAL 3: SAFE DISPOSITION OF HAZARDOUS REMNANTS OF WEAPONS PRODUCTION

Safe and effective characterization, stabilization, and storage of hazardous remnants of nuclear weapons production and decommissioning of legacy facilities in a manner that protects the worker, the public, and the environment.

The objectives and annual performance goals in support of the Board's third goal address the Board's efforts to confirm the safe disposition of hazardous nuclear weapons legacy materials and facilities. Achieving that goal requires a multi-year, multi-focus, multi-site effort during each annual performance period. The two strategic objectives that support that general goal address DOE's efforts to reduce the risks of legacy materials by appropriate processing and disposition, as well as efforts to decommission production facilities and sites no longer essential to the national security mission.

Strategic Objective 3–A: Material Stabilization: The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal, as needed.

Strategic Objective 3–B: Facility Decommissioning: The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.

Table 2-6(a) - Accomplishments Regarding Strategic Objective 3-A

Objective 3-A: Material Stabilization: The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal, as needed.

Examples of FY 1999 Accomplishments	Examples of FY 2000 Accomplishments
<p>Improved Remediation Schedules for Legacy Materials: In December 1998, after numerous formal and direct interactions with the Board and its staff, DOE issued an up-to-date plan and schedule for addressing the numerous health and safety risks posed by the highest priority legacy materials stored throughout the DOE nuclear weapons complex, originally identified by the Board in Recommendation 94-1. However, the Board identified several deficiencies in the new plan, and soon thereafter discovered that site-level planning did not support several significant commitments. The Board has engaged DOE on these issues, and will see that they are resolved expeditiously.</p> <p>Operational Problems at Savannah River Site: In the spring of 1999, the Board's continuing review of operational data for DOE defense nuclear facilities revealed a negative trend in control of work and operations at the Savannah River Site. The Board issued a letter to DOE in May 1999 identifying this problem to DOE, stating that a broader look at the underlying causes and a systematic understanding of those causes would be required to correct weaknesses in performance. In response, DOE has undertaken corrective actions to reverse this trend and ensure a sustained, highly satisfactory level of performance.</p> <p>Completion of Recommendation 94-3 at Rocky Flats: The Board issued Recommendation 94-3, <i>Rocky Flats Plutonium Storage</i>, to ensure that the large quantity of plutonium at the Rocky Flats Environmental Technology Site would be safely stored. The Board recommended that DOE take a systematic approach to evaluating the suitability of Building 371 for the proposed new mission of storing the site's entire plutonium inventory, and prepare a program plan for building upgrades and improvements consistent with the building's mission. As a result of the Board's recommendation, upgrades to the building's structure, systems, and components, as well as the safety basis, were completed during Fiscal Year 1999. The Board closed this recommendation and now considers the building adequate for its current storage mission.</p> <p>Characterization and Safety of Hanford High-Level Waste Tanks: The Board and its staff have continued to press DOE to resolve the health and safety issues presented by the 177 high-level waste tanks at Hanford. In 1999, the Board worked closely with DOE to develop a strategy for resolving the remaining safety-related uncertainties in the characterization of the wastes, and to ensure that DOE developed a sound strategy for mitigating flammable gas retention problems in Tank 241-SY-101. Because of these efforts, Board Recommendation 93-5, dealing with Hanford high-level waste characterization, is expected to be closed shortly, and the Board expects that DOE will be able to resolve the Tank 241-SY-101 problem in FY 2000.</p>	<p>Improved Remediation Schedules for Legacy Materials: On January 4, 2000, the Board issued Recommendation 2000-1 to ensure that the stabilization of legacy materials continues in a manner that reflects the risks posed by the materials. Additionally, the Board recommended that funding shortfalls preventing timely stabilization of materials be identified and reported as required by law. On June 8, 2000, DOE submitted a revised implementation plan intended to satisfy both Recommendation 94-1 and 2000-1. According to the plan the vast majority of remaining material will be stabilized within the next several years. Outstanding issues relating to material stabilization were communicated to DOE in a letter dated July 14, 2000.</p> <p>In accordance with the Implementation Plan for Board Recommendation 94-1 and the US District Court of Idaho Court Order, all spent nuclear fuel was removed from the unlined basins at the Idaho National Engineering and Environmental Laboratory CPP-603 Fuel Receiving and Storage Building to a newer fuel storage facility (CPP-666) by April 28, 2000. Transfer of the fuel reduces the risk of leakage of radioactive materials from deteriorating spent fuel in unlined basins and is the first step towards drying and encapsulation of the spent fuel in dry storage facilities for the longer-term.</p> <p>Standards for Safe Storage of Fissile Materials: In July 2000, DOE issued a standard for stabilization and packaging of uranium-233 metals and oxides for safe long-term storage. This standard was developed in response to Board Recommendation 97-1, with the Board working closely with DOE during its development to ensure that it contained appropriate requirements for safely storing this highly radioactive isotope. The Board also continued to assist DOE in refining a similar standard for safe packaging and storage of plutonium, which had been finalized and issued in response to Board Recommendation 94-1. In early 2000, after extensive review and discussions with DOE, the Board agreed to modifications to the plutonium standard that would make it easier to implement without compromising safety.</p> <p>Engineered Safety Controls: In several reviews of new operations at the Savannah River Site, the Board identified inadequacies in the use of engineered controls to prevent potential accidents. As a result, improved controls were implemented for high-level waste retrieval activities. The Board is pursuing similar improvements in the design of the equipment for pretreatment and vitrification of highly radioactive americium/curium solutions at Savannah River. The Board is continuing to press DOE to address the root cause of these problems, and to reaffirm the importance of avoiding an undue reliance on administrative controls and non-safety-grade equipment.</p> <p>Implementation of Radioactive Waste Management Order: In response to Board Recommendation 94-2, DOE has revised and reissued its radioactive waste management order, Order 435.1, to provide more comprehensive and effective requirements. The Board discovered this year that DOE had informed the operating contractor at Rocky Flats that several key provisions of the order did not apply to Rocky Flats on the grounds that it was not considered an operating facility. The Board acted immediately to correct this problem, ultimately issuing formal correspondence that led DOE to reverse this inappropriate interpretation before it spread to other sites.</p> <p>Safe Storage of High-Level Waste: In June 2000, the Board's staff completed a review of high-level waste tank systems at the Hanford Site. Several significant issues were identified related to preserving the integrity of the storage tanks, notably the need to promptly correct the chemistry in tanks that had become depleted of corrosion inhibitors, the need to ensure the operability of ventilation systems required to prevent moisture from forming between the walls of double-shell tanks (a scenario suspected to have resulted in corrosion of the tank walls), and the need for increased rigor in the inspection program for the secondary wall of double-shell tanks. DOE was formally notified of these observations in a letter dated August 29, 2000, and is working to correct the problems.</p>

Table 2-6(b) - Performance Goals Regarding Strategic Objective 3-A

Objective 3–A: **Material Stabilization:** The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal, as needed.

FY 2001 Performance Goals	FY 2002 Performance Goals
<p>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, the safety of ongoing operations, and the suitability of long-term storage and disposal facilities. Representative areas for review include:</p> <ul style="list-style-type: none"> • Stabilization and packaging of plutonium metal and oxide at Hanford and Rocky Flats (Recommendation 94-1). • Stabilization and disposal of plutonium-bearing solutions and residues at Hanford and Rocky Flats (Recommendation 94-1). • Preparations for characterizing, stabilizing, and repackaging uranium-233 materials at Oak Ridge (Recommendation 97-1). • Designs and technologies of the proposed Plutonium Immobilization Project and Pit Disassembly and Conversion Facility, and their interfaces with the proposed mixed oxide fuel fabrication facility. • Design of high-level waste treatment facilities at the Hanford Site; selection of a treatment process for high-level waste liquids and salts at the Savannah River Site (Recommendation 96-1). • Design, construction, and testing of high-level waste retrieval/transfer systems at Hanford. • Safety of operations at Waste Isolation Pilot Plant (WIPP) as activities ramp up from initial startup, and preparations to receive remote-handled transuranic wastes at WIPP, including preparations at the sites that will be the first to ship such wastes to WIPP. • Implementation of newly issued DOE Order 435.1, <i>Radioactive Waste Management</i>, governing all phases of the life cycle of high-level, low-level, transuranic, and mixed wastes. • Operation of new plutonium storage facilities, such as the Savannah River Site's K-Area Materials Storage Facility, and modifications to storage vaults at the Hanford Plutonium Finishing Plant. 	<p>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, the safety of ongoing operations, and the suitability of long-term storage and disposal facilities. Representative areas for review include:</p> <ul style="list-style-type: none"> • Stabilization and packaging of plutonium metal and oxide at Hanford and LANL (Recommendation 94-1). • Design of facilities for stabilization and packaging of plutonium metal and oxide at Savannah River (Recommendation 94-1). • Stabilization and disposal of plutonium-bearing solutions and residues at Savannah River and LANL (Recommendation 94-1). • Characterization, stabilization, and packaging of neptunium solutions at Savannah River (Recommendation 94-1). • Preparations for pretreatment and vitrification of americium/curium solutions at Savannah River (Recommendation 94-1). • Characterization, stabilization, and packaging of uranium-233 materials at Oak Ridge (Recommendation 97-1). • Stabilization and disposition of highly-enriched uranium solutions at Savannah River (Recommendation 94-1). • Design of the proposed Plutonium Immobilization Facility and Pit Disassembly and Conversion Facility (or alternative approaches to provide these functions), and their interfaces with the proposed mixed oxide fuel fabrication facility. • Design of the chosen treatment process for high-level waste liquids and salts at the Savannah River Site (Recommendation 96-1). • Design of facilities for treatment of high-level waste, and testing and operation of high-level waste retrieval and transfer systems at Hanford. • Safety of operations at WIPP and at sites preparing wastes for shipment to WIPP.

Table 2-7(a) - Accomplishments Regarding Strategic Objective 3-B

Objective 3-B: **Facility Decommissioning:** The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.

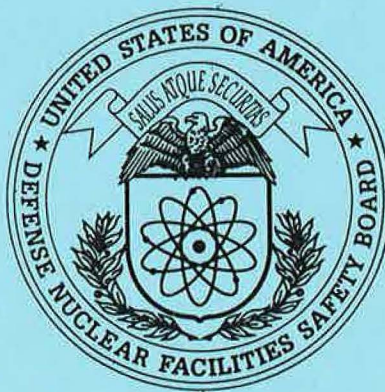
Examples of FY 1999 Accomplishments	Examples of FY 2000 Accomplishments
<p>Upgraded Safety Controls for Decommissioning at Rocky Flats: Decommissioning activities are being conducted in several buildings at the Rocky Flats Environmental Technology Site. The Board identified that safety controls for protection of workers did not provide the desired level of protection because of an inappropriate reliance on personal protective equipment (e.g., respirators) rather than engineered controls to eliminate or mitigate hazards. Furthermore, when engineered controls were used (e.g., air movers), they were not adequately analyzed to ensure that they produced the desired result. In response to these concerns, a multi-disciplinary team was chartered at RFETS to develop more rigorous engineered controls and analyze performance of the controls. Enhanced worker protection controls are now being applied to demolition of contaminated equipment at the site. RFETS is also investigating the use of remote equipment for size reduction of contaminated equipment.</p> <p>Activity Level ISM of Hanford Decommissioning Work: The Board's staff reviewed planning and implementation of decommissioning work being done by the Hanford Environmental Restoration Contractor. The staff found that the work control procedures and practices need improvement to meet the intent of Integrated Safety Management. The approach to hazard analysis does not use techniques such as those described by the American Institute of Chemical Engineers <i>Guidelines for Hazard Evaluation Procedures</i>, or the U.S. Department of Labor, Occupational Safety and Health (OSHA) publication, OSHA 3071, <i>Job Hazard Analysis</i>. These deficiencies are such that it is not clear that the controls are adequate to protect personnel performing decommissioning work at Hanford. Some areas of needed improvement have been communicated directly to DOE.</p> <p>Radiation Protection Measures for Metal Tritides during Decommissioning: During FY 1999, the Board's staff evaluated radiation protection program measures for decommissioning work in areas at the Miamisburg Environmental Management Project (MEMP) that are suspected of being contaminated with tritium compounds such as metal tritides. As a result of staff visits and subsequent information exchanges, the MEMP contractor prepared a corrective action plan to address deficiencies in the radiation protection program, and work is proceeding to resolve these issues before major decommissioning work begins in mid-September 1999. These technical issues also apply to other defense nuclear facilities, so the Board has requested that DOE articulate a technical position on this matter to ensure that appropriate measures are implemented across the defense nuclear facilities complex. As a result of this action, DOE-EM informed DOE Field Offices of the issue, drafted a technical position regarding control levels for airborne radioactivity, and has committed to developing an updated technical approach.</p>	<p>Efforts to Improve Decommissioning Work at the Hanford 233-S Facility: The Board's staff has monitored the planning and accomplishment of decommissioning work at the Hanford 233-S Plutonium Concentration Facility. Board correspondence and staff comments to DOE and its contractor regarding this facility have focused on work planning and implementation deficiencies. Safety deficiencies involving the work site and Process Hood glove bags noted by the staff have been discussed with project personnel, and corrective actions were taken to resolve some concerns. The staff has noted that efforts are being made to improve work planning and implementation. For example, the contractor held a workshop to review the radiological work planning process and provide recommendations for improvement, and a contractor project manager requested that a team of contractor and DOE health physicists inspect glove bags used in Process Hood decommissioning work.</p> <p>Upgraded Work Controls for Decommissioning at Rocky Flats: The Board has followed dismantlement work activities for gloveboxes and other equipment in Building 771 (the former Plutonium Recovery Facility) at the Rocky Flat Environmental Technology Site (RFETS) and has issued correspondence noting problems with work planning and control. The staff reviewed the implementation of the RFETS Integrated Work Control Program (IWCP) and provided comments to RFETS personnel. The contractor revised the IWCP manual and has taken steps to improve the implementation of the program. This action has contributed to addressing the staff's observations of deficient implementation of the hazard analysis process for deactivation and decommissioning activities in facilities such as Building 771.</p> <p>Upgraded Safety Controls for Decommissioning Work at Rocky Flats: The Board's staff has followed RFETS' efforts to apply engineered controls for size reduction of gloveboxes and other equipment in response to comments provided by the Board. These controls will help remove or greatly reduce the radioactive airborne environment. The staff has continued to communicate the need to mitigate or eliminate hazards by the use of engineered controls, and RFETS personnel are actively pursuing a phased approach of design, testing, and implementation of engineered controls in support of their site closure work.</p> <p>New and Revised Procedures for Decommissioning Work at the Miamisburg Environmental Management Project: The Board's staff reviewed and provided comments regarding a draft technical basis document, new and revised implementing procedures, and plans for determining readiness for decommissioning work involving special tritiated compounds at the Miamisburg Environmental Management Project (MEMP). These comments contributed to improving the documents. Various work control documents have been reviewed, and staff comments have been provided to DOE-MEMP and the contractor. Staff-to-staff discussion is expected to help better identify and resolve deficiencies.</p>

Table 2-7(b) - Performance Goals Regarding Strategic Objective 3-B

Objective 3–B: <u>Facility Decommissioning:</u> The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.	
FY 2001 Performance Goals	FY 2002 Performance Goals
<p>The Board and its staff will conduct assessments of the adequacy of plans, standards, procedures, and execution for activities associated with decommissioning of DOE defense nuclear facilities. These assessments will be conducted using the principles of integrated safety management to ensure that decommissioning efforts are performed safely. Additionally, the Board and its staff will continue efforts to confirm that high-risk facilities are decommissioned in a timely manner. These assessments are conducted in collaboration with State and other regulatory authorities, as needed, and on a schedule that supports DOE’s operational plans. Representative areas for Board and staff review include:</p> <ul style="list-style-type: none">• Canyon Disposition Initiative at Hanford.• Building 707, 771, or 776 at Rocky Flats.• Building 9206 at Oak Ridge.• Decommissioning activity at the Miamisburg Environmental Management Project.• High-level waste tank closure plans at INEEL.	<p>The Board and its staff will conduct assessments of the adequacy of plans, standards, procedures, and execution for activities associated with decommissioning of DOE defense nuclear facilities. These assessments will be conducted using the principles of integrated safety management to ensure that decommissioning efforts are performed safely. Additionally, the Board and its staff will continue efforts to confirm that high-risk facilities are decommissioned in a timely manner. These assessments are conducted in collaboration with State and other regulatory authorities, as needed, and on a schedule that supports DOE’s operational plans. Representative areas for Board and staff review include:</p> <ul style="list-style-type: none">• Plutonium Finishing Plant deactivation planning at Hanford.• Building 371, 707, or 776 at Rocky Flats.• Excess facility risk reduction activity at the Savannah River Site.• Decommissioning activity at the Los Alamos National Laboratory.▪ 602 Reprocessing Plant decommissioning plans at INEEL.

FY 2003
BUDGET REQUEST
TO THE
CONGRESS

Defense Nuclear Facilities Safety Board



February 2002

**Defense Nuclear Facilities
Safety Board
FY 2003 Congressional Budget Request**

APPROPRIATION & EXPENSE SUMMARY

(Tabular dollars in thousands).

OPERATING EXPENSES

	ACTUAL FOR <u>FY 2001</u>	PROJECTED FOR <u>FY 2002</u>	BUDGET REQUEST FOR <u>FY 2003</u>	BUDGET REQUEST FOR FY 2003 WITH LEGISLATIVE <u>PROPOSAL **</u>
New Budget Authority	18,458*	18,500	19,000	19,494
Obligations	19,533	19,612	20,217	20,711
Outlays	17,706	18,500	19,400	19,894

* \$18,500,000 appropriation; \$42,000 rescission.

** Includes \$494,000 to cover the estimated cost of the Administration's legislative proposal to increase agency costs for accruing employee CSRS pension costs and annuitant health benefits for all employees, while reducing reported costs from central mandatory accounts by an equal amount.

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).

**Defense Nuclear Facilities
Safety Board
FY 2003 Congressional Budget Request**

PERSONNEL SUMMARY

	FY 2001 <u>ACTUAL</u>	FY 2002 BUDGET <u>PLAN</u>	FY 2003 BUDGET <u>REQUEST</u>
Statutory Personnel Ceiling: (FTE's) ^{1/}	150	150	150
FTE Usage ^{2/}	93	102	102
<hr/>			
Board Members & Permanent Employees at End of Fiscal Year	96	102	102

^{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 safety 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 5 full-time Board Members.

**Defense Nuclear Facilities
Safety Board
FY 2003 Congressional Budget Request**

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 441, [\$18,500,000] \$19,494,000, to remain available until expended. (*Energy and Water Development Appropriations Act, 2002; Additional authorization legislation required.*)

**Defense Nuclear Facilities
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FY 2003 Congressional Budget Request**

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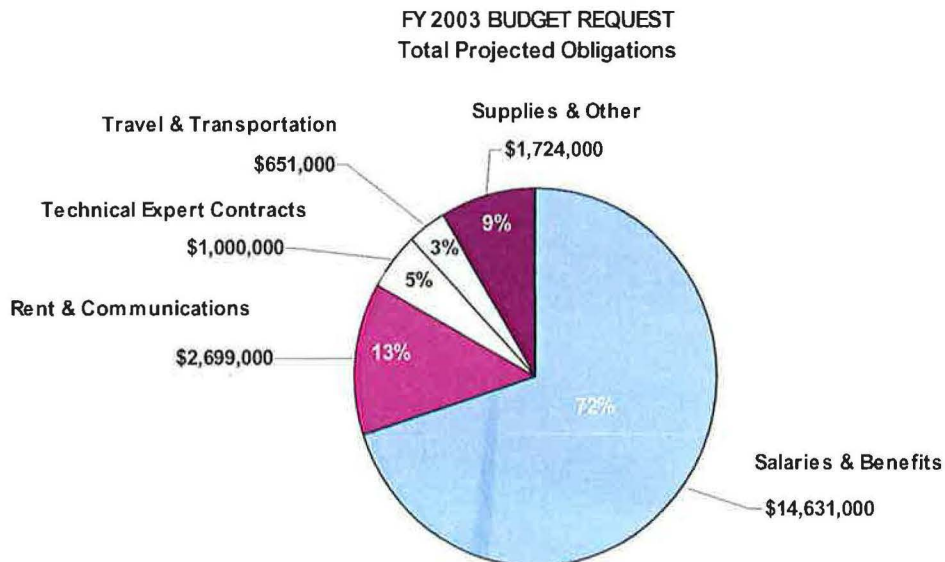
**Defense Nuclear Facilities
Safety Board
FY 2003 Congressional Budget Request**

1. EXECUTIVE SUMMARY

Appropriation Request for FY 2003

The Defense Nuclear Facilities Safety Board's (Board) FY 2003 OMB Budget Request is for \$19,494,000 and 102 Full-time Equivalent (FTE) staff years, to support the Board's public and worker health and safety oversight activities. The Board requires \$19 million in new budget authority to offset the compounding growth effects in non-discretionary expenses such as cost-of-living pay increases and rent for office space, and more importantly, replace key technical staff lost due to attrition. Specifically, a \$500,000 increase in funding is requested to help the Board pay for the out-year impacts of the 3.81 percent and 4.6 percent cost-of-living pay increases effective in January 2001 and January 2002 respectively, as well as the projected pay increase of 2.6 percent effective in January 2003.

As depicted in the following chart, the Board's budget is used primarily to pay the salaries and benefits of its employees, and therefore limits the Board's ability to absorb non-discretionary pay increases from other sources.



The appropriation request also includes \$494,000 to cover the estimated cost of the Administration's legislative proposal to increase agency costs for accruing employee CSRS pension costs and annuitant health benefits for all employees, while reducing reported costs from central mandatory accounts by an equal amount. (Please see Appendix B for additional information.)

The technical complexity and safety risks associated with the life cycle of this Nation's nuclear weapons, including the overall health and safety of the public, dictate a continuing need for strong Federal leadership and budget support. Safety oversight programs conducted by the Board directly impact the health and safety of the public and need continued support due to the potential for significant loss of life, injury, or property damage if an accident should occur.

Background

The Board is an independent Federal agency established by Congress in 1988. Broadly speaking, the Board's mandate under the Atomic Energy Act is safety oversight of the defense nuclear weapons complex operated by the Department of Energy (DOE). The nuclear weapons program remains a complex and hazardous operation. DOE must maintain readiness of the nuclear arsenal, dismantle surplus weapons, dispose of excess radioactive materials, clean up surplus defense facilities, and construct new facilities for many purposes. All of these functions must be carried out in a manner that protects the public, the workers, and the environment. For a more detailed discussion of the Board's statutory mission, please see Appendix A.

Congress expects the Board to be an independent, expert agency capable of understanding the complexity of nuclear weapons facilities and operations. For that reason, the five, full-time Board Members are required by statute to be experts in the field of nuclear safety. The Board has, in turn, assembled a small permanent staff with broad nuclear weapon and industry experience and competence in all major aspects of nuclear safety: nuclear, mechanical, electrical, chemical, and structural engineering, as well as physics and metallurgy. Currently, 92 percent of the Board's technical staff hold advanced degrees, of which 30 percent are at the Ph.D. level.

Safety Oversight Mission

DOE is committed to numerous new design and construction projects during the next decade to provide nuclear weapons stockpile support for the Nation's defense and to resolve the remaining health and safety issues that are the historical legacy of weapons production. For example, tritium extraction for stockpile use, conduct of nuclear experimentation, and preservation of the strategic pit inventory, will require the Board to oversee the health and safety of new defense nuclear operations. DOE's National Nuclear Security Administration (NNSA) also is developing a strategy that will change the balance and location of some defense nuclear work throughout the complex. As this strategy is implemented, some sites that have seen lesser amounts of nuclear work in recent years (such as the Lawrence Livermore National Laboratory and the Nevada Test Site) will significantly increase program activity.

While focusing attention on existing defense nuclear facilities and operations, the Board is also required by statute to review design efforts, construction activities, and the initial operation of new defense nuclear facilities, and to make timely recommendations on any needed public health and

safety improvements to the Secretary of Energy. The technical capability of the Board is essential to ensuring that safety is addressed early in the design work planned during FY 2003 for four new defense nuclear facilities, as well as 21 ongoing projects in the design phase. Safely implementing the transfer of hazardous defense nuclear activities between sites—with the associated need to assure competent personnel, rigorous authorization basis control, and effective operational safety management—also will continue to pose many challenges for DOE and its contractors, as well as associated oversight challenges for the Board. This significant projected increase in workload, described more fully in Section 4 of this budget request, will require the Board to quickly replace the recent losses in its technical staff in the areas of design, safety analysis, and operations.

Direct Service Delivery To Citizens

The Board continues to be sensitive to the need for citizen involvement. To that end, the Board has used open public meetings and hearings, as well as its Web Site (www.dnfsb.gov), to increase public awareness, communicate the Board's activities, and solicit citizen comments and issues.

The Board has also continued its practice of meeting with state and local officials, labor leaders, DOE's facility workers, citizen advisory boards, public interest groups, and area residents to exchange information and inform interested parties of the Board's work. Board Members have held public meetings and hearings in the vicinity of DOE's defense facilities, most recently in communities near the Hanford Site, the Savannah River Site, the Oak Ridge Reservation, and the Pantex Plant. To date, a total of 35 public meetings have been held at or near DOE sites and 46 in Washington, D.C. The records of these meetings are made available to the public.

Using recently developed media streaming technology, the Board began broadcasting its public meetings via the Internet in August 2001. Each broadcast also is stored on the Board's Website for viewing at the convenience of the public. This technology will ensure that the largest number of interested citizens will have access to the Board's oversight work, and provide direct service delivery to the workers and citizens in their homes.

Strategic Management of Human Capital

As clearly recognized by the Congress when evaluating the Board, the ability to effectively carry out an independent, technical oversight program throughout the DOE weapons complex is dependent on the technical capability of the Board Members and staff.

The conferees believe that the DNFSB is a unique Federal agency, in that its mission (is) to oversee the activities of another federal department whose work is highly technical and potentially dangerous, and that to properly carry out its mission, not only the DNFSB members but also its limited staff must be technically competent in all major phases of nuclear safety. ¹

¹ National Defense Authorization Act for Fiscal Year 1991, Conference Report, H.R. Conf. Rep. No. 923, 101st Cong. 2nd Sess. 767 (1990).

Simply stated, the ability of the Board to fulfill its public and worker health and safety mission rests heavily on attracting and retaining top caliber technical staff. As a relatively new agency, the Board was free to create a streamlined organization, specifically tailored to meet its specialized scientific and technical mission, without the encumbrances often associated with traditional government operations such as vertical layering, duplication of function, a proliferation of supervisory positions, and entrenched bureaucratic rules, regulations, and practices. The Board has been successful in creating a work environment that emphasizes excellence as the standard for staff performance and rewards the staff accordingly. The pay banding and pay for performance programs developed and implemented by the Board have proven to be very effective in hiring technical talent, holding employees accountable for their performance, and rewarding outstanding performance on the job.

The Board's success in accomplishing these goals has been recognized by independent audits conducted by the Office of Personnel Management (OPM) and the Institute of Public Administration. For example, OPM completed an extensive survey and review of the Board's human resources management programs in August 2000 and reported the following:

[Board] employees believe that supervisors communicate job expectations, that performance appraisals are fair, and that awards are based on performance. High performance is continually recognized, both monetarily and non-monetarily. Employees recognize the award-achievement connection. [This] indicates how much the Board differs from the rest of the Government in terms of performance management.

Using the excepted service hiring and classification authorities granted the Board in its enabling legislation, together with the other hiring and retention authorities (e.g., recruitment and relocation bonuses, and retention allowances), the Board has been generally successful in competing for scientific and technical staff in a very competitive market when funds are available to pay for the added salary and benefits.

The challenges in recruiting and retaining a high-quality, diverse workforce can be grouped into two categories: (1) competition from the private sector, and (2) fiscal constraints. Competition for top engineering professionals is intense. Even with the special hiring and pay authorities granted to this Board, private industry can easily outbid and out-perk the Board for the top-caliber engineering talent that the Board needs to conduct its health and safety oversight operations. The Board has also found that the Federal downsizing campaigns of the 1990's, coupled with the perception that the Federal bureaucracy stifles creativity and fails to encourage and reward outstanding work, have created sizable obstacles to overcome in our recruiting campaigns. Recruitment and retention of recent college engineering graduates, especially women and minorities, is difficult in the current job market and will become even more challenging with the renewed interest in the commercial nuclear market.

Fiscal constraints also have been a major impediment to replacing staff lost through attrition. During the past four years, the Board did not replace eight former key technical staff in order to offset funding deficiencies. Specifically, the Board was forced to postpone hiring for the lack of sufficient appropriated funds to pay staff salaries and benefits. The Board's special human resource

authorities, designed to increase our competitiveness for hiring and retaining vital technical staff, are negated when recruitment is halted due to the lack of funds. Small agencies such as this Board do not have the flexibility to absorb both non-discretionary annual cost-of-living increases and appropriation reductions. Since the Board currently is operating at 62 percent of its statutory employment ceiling as of January 30, 2002, the 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.

With the enactment of the Board's full appropriation request of \$18.5 million for FY 2002, the Board intends to replace key staff who have left the Board in previous years. By the end of FY 2002, the Board expects to hire six replacement employees to reach the projected need of 102 for FY 2003 (includes five full-time Board Members in total). These replacement hires will include: nuclear weapons engineers and design, safety analysis, and operations specialists.

The Board plans to continue its recruitment of engineering and technical students through its Professional Development Program (PDP) to address the expected loss of staff capabilities. The PDP is a three-year program that 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 to attract the next generation of scientific and technical talent to Federal service. In addition to receiving well-structured, challenging work assignments, candidates are provided competitive salaries, a wide variety of benefits, monetary and non-monetary rewards, paid training and recruitment bonuses.

Restructuring Initiatives

As a small agency currently with 93 staff and 4 full-time Board Members, the Board has neither the luxury nor need to establish layers of management or complex procedures to conduct the Board's oversight mission. The scientific and technical staff regularly interface directly with the Board Members on the development of technical reports and recommendations. Each staff member has specific duties and responsibilities and is held accountable for the timely delivery of products and services commensurate with his or her speciality. In turn, the Board routinely delegates specific authorities directly to the line managers and staff to help the staff in performing the oversight mission. Examples of such delegations are as follows:

- The Board's site representatives, stationed at selected DOE defense nuclear facilities, submit their weekly reports covering significant health and safety issues directly to the Board via E-mail without prior review.
- Government purchase (credit) cards are provided to site representatives in field locations, as well as staff in support areas such as Information Technology, Human Resources, and Travel for their use as necessary to purchase the goods and services needed to conduct operations.
- The approval of travel and training requests has been delegated to the line managers to eliminate lengthy reviews of these time-sensitive requests.

One method for reducing bureaucratic layering is to eliminate the performance of non-mission-essential functions within the agency. Using Interagency Agreements, the Board arranges for needed support services such as payroll, accounting, health screening, and alternative dispute resolution from other Federal agencies. Consequently, limited staff resources can be devoted to the Board's health and safety oversight mission.

The Defense Nuclear Facilities Safety Board has carefully crafted and implemented a streamlined approach to operations that fully supports the President's goals in this area. As a relatively new organization without the burden of an out-of-date personnel system, excessive rules, or a rigid organizational structure with layers of supervisors, the Board was able to create an agency that promotes efficiency and maximizes the utility of each employee. As a consequence, morale has remained high and turnover well below the national average for the scientific and engineering professions. At this time, additional organizational changes would not decrease operating costs and could impact the success that the Board has achieved in meeting its public and worker health and safety goals and objectives.

2. SAFETY OVERSIGHT STRATEGY

Maintaining an effective safety oversight program that fulfills the broad mandates of the Board's enabling legislation requires a constant reassessment of health and safety conditions throughout DOE's defense nuclear complex. The Board continues to focus its attention on the most hazardous DOE operations and complex-wide health and safety issues, consistent with the Board's safety oversight approach and its strategic plan. Specifically, the Board has prioritized the application of its resources to emphasize nuclear safety review activities at the following sites, plants, and facilities:

- *Pantex Plant (Texas)*—Stewardship and maintenance of the nuclear weapons stockpile including assembly, evaluation, maintenance, and dismantlement of nuclear explosives and the storage of special nuclear material, particularly plutonium pits.
- *Savannah River Site (South Carolina)*—Operation of existing tritium facilities and design and construction of new facilities for the extraction of tritium, storage of special nuclear material, and the stabilization of high-level waste and residual materials from the former production of the nation's nuclear weapons arsenal.
- *Nevada Test Site*—Stewardship of the nuclear weapons stockpile, including subcritical experiments, and the capability to deal with damaged nuclear weapons and improvised nuclear devices.
- *Oak Ridge Y-12 National Security Complex (Tennessee)*—Stewardship and maintenance of nuclear weapons components including highly enriched uranium processing; fabrication, assembly, and disassembly of nuclear weapon components and subassemblies, and storage of nuclear materials, including uranium from weapon components.

- *Los Alamos National Laboratory (New Mexico), Lawrence Livermore National Laboratory (California), and Sandia National Laboratories (New Mexico and California)*—Support for stockpile management and stewardship of the nation’s nuclear weapons, including research and enhanced surveillance of aging weapons.
- *Hanford Site (Washington)*—Remediation of high-level radioactive waste, stabilization of corroding highly radioactive spent nuclear fuel currently stored in the K-East and K-West Basins, and stabilization of residual material from plutonium production.
- *Rocky Flats Environmental Technology Site (Colorado)*—Stabilization of residuals of plutonium production and deactivation of numerous highly contaminated buildings.

Sources of information used by the Board in formulating its assessments, evaluations, and recommendations to the Secretary of Energy are varied. They include testimony from public hearings and meetings, Congressional inquiries, reports from site representatives, staff issue papers, site visits, Implementation Plans for the Board’s recommendations, responses to reporting requirements, and correspondence from workers and union representatives at the DOE sites. The Board’s priorities change to reflect its assessment of the risks and potential effects on the health and safety of the public or workers, resulting in revised technical review assignments for the Board’s staff.

On the basis of 12 years of operating experience, the Board has established the following guiding principles for maximizing the effective use of its resources:

- The primary responsibility for ensuring protection of the health and safety of the public and workers rests with DOE’s line managers and extends in an unbroken chain from the Secretary of Energy to the workers on the floor.
- As an external action-forcing agency, the Board influences the actions of DOE’s line management to the extent necessary to achieve its objectives of improved safety.
- Effective safety management demands that safety expectations be clearly defined and tailored to specific hazards at all levels—site, facility, and activity.
- Technical expertise is required to define and ensure compliance with controls commensurate with the identified hazards.
- Safety oversight activities are prioritized largely on the basis of risks to the public and workers. Key indicators are the types and quantities of nuclear material at risk, and the process and setting of the operations involved.
- Safety oversight responsibilities for defense nuclear facilities will be accomplished in full cooperation with other agencies, such as individual states and the Environmental Protection Agency with regard to final cleanup, demolition, and environmental restoration activities, in compliance with responsibilities mandated by the Atomic Energy Act of 1954, as amended, and federal environmental laws.

3. SAFETY OVERSIGHT IN PRACTICE

Representative examples of the Board's contributions to the health and safety of the public and workers, resulting from the practical application of the above safety oversight principles, are discussed in the following paragraphs.

Disposition of Damaged Nuclear Weapons. Until recently, DOE relied on the people, facilities, and processes developed to support underground nuclear weapons testing to provide the mission capability to dispose of damaged nuclear weapons or recovered nuclear devices. With the ban on nuclear weapons testing at the Nevada Test Site (NTS), DOE's capability to safely perform this mission had been eroding. The personnel and the facility infrastructure required to support testing operations, and therefore damaged weapon disposal operations, had been diminishing. Planning for these operations so that they could be executed safely in today's environment presented a unique challenge.

The Board has been urging DOE to develop a method to maintain personnel proficiency, maintain up-to-date processes and preserve the infrastructure at NTS necessary to support this capability. In response to the Board's initiative, DOE formed the Disposition Focus Group to define lines of responsibility and requirements and to develop a process, plans, and procedures to dispose of damaged nuclear weapons or improvised nuclear devices.

During the last year, DOE continued its efforts to respond to the Board and upgrade G-tunnel, a facility at the Nevada Test Site that has been idle for many years. A multi-year improvement plan for G-tunnel has been developed and improvements are ongoing. Lighting and ventilation upgrades have been completed, as will an initial safety analysis report which will ensure that hazards are identified beforehand and controls are developed and implemented to the extent possible prior to being faced with an actual emergency situation. The G-tunnel will be available and drills developed for its use in disposing of damaged nuclear devices. DOE has also conducted a series of drills and exercises to maintain the skills of individuals involved with the special radiological emergency responses assets (such as Accident Response Group and Nuclear Emergency Search Team). Overall, DOE's efforts in response to the Board's initiative have re-established a viable capability to dispose of damaged nuclear weapons or improvised nuclear devices and are continuing to improve the safety and readiness of this important capability.

Quality Assurance. The nuclear industry has sought to ensure high quality in the systems, structures, and components upon which the safe application of nuclear technology depends. The achievement of a high degree of quality was found to be more likely if engineered products were subjected to disciplined design, procurement, fabrication, construction, testing, and operational processes, and if the effectiveness of those processes was independently verified. Additionally, computer software, used to determine the possible effects of identified hazards and to design and control safety-related structures, systems, and components, must adhere to rigorous quality assurance standards to ensure its validity and proper application to sound safety management. To realize these attributes, DOE's Quality Assurance (QA) Program must ensure the highest quality of the design,

- procurement and fabrication of nuclear-related products and processes that serve important nuclear safety functions.

During the past several years, DOE enforcement actions, internal DOE assessments, and Board letters and staff reports, have indicated that DOE's QA Program is not being implemented to the level required to ensure adequate safety. As a result of inquiries by the Board's staff during 1995 into DOE's efforts to control the introduction of suspect/counterfeit parts into safety applications, DOE established the Quality Assurance Working Group to address Department-wide quality assurance issues.

In January 2000, the Board issued DNFSB/TECH-25, *Quality Assurance for Safety-Related Software at Department of Energy Defense Nuclear Facilities*, raising issues with the process of developing and maintaining the software used for performing safety analysis and design, and for controlling safety-related systems at DOE's defense nuclear facilities. The issuance of Board report DNFSB/TECH-31, *Engineering Quality Into Safety Systems*, in March 2001 provided additional insights into DOE QA Program requirements, processes and problems.

Corrective action plans to address the welding QA issues, and to evaluate DOE's QA Program more generally, were finalized by September 2000, with evaluative efforts beginning in October 2000. This ongoing DOE effort is two-pronged, with NNSA evaluating its own facilities and the Quality Assurance Working Group evaluating the status of these programs at other DOE defense nuclear facilities. Results to date have disclosed a number of inconsistencies, especially in the rigor with which QA Program requirements are being implemented, both among sites and among different technical disciplines at individual sites.

As a result of the Board's urging, DOE provided corrective action plans that addressed some of the issues raised in the Board's report on software QA, conducted surveys of software quality assurance at DOE field sites, and conducted QA Program assessments at eight of their field sites. On-site reviews were also conducted by the Board's staff to assess the facility level implementation of software QA corrective actions to date. These surveys and assessments likewise have produced mixed results, and the work is continuing.

The Board also has held three public meetings on quality assurance. The first meeting gathered information and additional insight from industry experts and DOE representatives into quality assurance requirements and processes. The second meeting addressed the importance of software quality assurance and explored the approaches used by the Department of Defense, the National Aeronautics and Space Administration, the chemical industry, and the nuclear power industry. The third meeting presented the results of the software quality assurance reviews by the Board staff and the site QA Program reviews by DOE, and provided the status of DOE's progress in addressing software quality assurance issues. The purpose of these public meetings was to assess DOE's progress and current activities to strengthen quality assurance. This information will determine additional Board actions to further enhance the DOE QA Program in FY 2002 and 2003.

Stabilization of Legacy Nuclear Materials. During the era of weapons production, plutonium and other weapon materials were in demand as feed materials, and plutonium-rich scrap from weapon fabrication processes was quickly recycled. This situation changed dramatically as

DOE began to shut down weapon production activities at many defense nuclear facilities. As a result, substantial quantities of plutonium, uranium, transuranic isotopes, and irradiated fuel have remained in storage for extended periods under potentially unsafe and deteriorating conditions. To address this situation, the Board's Recommendation 94-1 counseled DOE to process these materials on an accelerated basis, converting them to stable forms and then packaging them for safe interim storage, pending decisions about their ultimate disposition. The Board followed this recommendation with Recommendation 97-1, which specifically addressed highly-radioactive Uranium-233 materials held at several DOE defense nuclear facilities, and Recommendation 2000-1, which reemphasized the importance of the legacy materials stabilization mission, established priorities for the significant quantity of materials remaining to be stabilized under Recommendation 94-1, and recommended that, as required by law, DOE identify and report funding shortfalls that prevented more timely action.

Significant risk reduction and stabilization of materials have been accomplished under the legacy nuclear materials program. A large portion of the plutonium solutions and residues, special isotopes, and irradiated fuel and targets have been stabilized. However, significant hazards remain, key stabilization activities have been delayed, and technical and programmatic difficulties threaten to cause further delays in risk reduction.

In response to continuing interactions with the Board, the Secretary of Energy issued a revised Implementation Plan for Recommendations 94-1 and 2000-1 on January 19, 2001. This latest plan establishes a path forward for all materials covered by Recommendation 94-1 and defines aspects of the program that were previously indeterminate. However, the Board's evaluation concluded that activities at the Savannah River Site and Los Alamos National Laboratory are not being pursued with the requisite urgency, and other projects, notably the Hanford Spent Nuclear Fuel Project and the Savannah River Site Americium/Curium Vitrification Project, face major technical and programmatic challenges.

It is apparent that significant quantities of legacy materials beyond those addressed by Recommendations 94-1, 97-1, and 2000-1 will require timely stabilization and disposition in order to prevent new storage hazards from developing. Given the limited progress made by DOE in resolving these issues, the Board expects that substantial effort will be required in the near term to ensure that stabilization and storage of these residual materials continues on an acceptable schedule and that appropriate stabilization capabilities are maintained in the DOE complex.

4. FUTURE CHALLENGES FOR THE BOARD'S SAFETY OVERSIGHT

The following discussion addresses some of the key challenges facing the Board in its safety oversight of DOE that will require continuing attention by the Board and its staff. The Board's budget request for \$19,494,000 and associated performance plans in Appendix D have been structured to meet these projected workload challenges.

A number of new design and construction projects scheduled during the next decade are aimed at providing support for the nuclear weapons stockpile, as well as resolving the remaining health and safety issues that are the historical legacy of weapons production. Examples include the

Highly Enriched Uranium Materials Facility at the Y-12 National Security Complex; the Tritium Extraction Facility at the Savannah River Site; and the Waste Treatment Facility at the Hanford Site. The Board's enabling statute requires that it review the design, construction, and operation of new defense nuclear facilities, and make timely recommendations to the Secretary of Energy on any needed public health and safety improvements. This significant projected increase in workload for projects in the design phase will make substantial demands on the Board's resources in such areas as design, safety analysis, and operations.

To maximize the efficient use of its resources in direct support of the nuclear weapons stockpile, DOE/NNSA is developing a strategy that will change the balance and location of some defense nuclear work throughout the complex. As this strategy is implemented, some sites that have seen lesser amounts of nuclear work in recent years (such as Lawrence Livermore National Laboratory and the Nevada Test Site) will be required to significantly increase the tempo of their efforts. Safely implementing the transfer of hazardous defense nuclear activities between sites—with the associated need to ensure competent personnel, rigorous authorization basis control, and effective operational safety management—will pose many challenges to DOE and its contractors, as well as associated oversight challenges to the Board.

The Board's oversight activities continue to reveal technical issues that have the potential to affect the safety of activities related to management of the nuclear weapons stockpile. For example, in response to the Board's initiative, DOE has reconstituted its ability to safely dispose of a damaged nuclear weapon at the Nevada Test Site (see Section 3). DOE has taken substantial steps to prepare a safe location to store and assess damaged nuclear weapons, but the completion of planned additional facility improvements, process refinements, and training is still necessary and will require attention by the Board and its staff.

DOE, in cooperation with the Department of Defense, is working to define the research, development, and manufacturing infrastructure that will be necessary to support the enduring stockpile in the absence of critical nuclear testing. Tritium extraction for stockpile use, the conduct of nuclear experimentation, and the production of new pits will require the Board to conduct health and safety oversight of new defense nuclear operations throughout the next decade and beyond. In addition, DOE is ramping up its programs to extend the life of weapons in the enduring stockpile. These life extension programs will require more, and more complex, operations to disassemble, refurbish, reassemble, and re-certify nuclear weapons and components than had been done in the recent past when smaller numbers of weapons were disassembled only for inspection. In addition to larger numbers of unit operations, DOE will also be required to develop or restart complex and potentially hazardous operations to refurbish or re-manufacture individual weapon components. To effectively oversee these operations and at the same time strike a proper balance among national security requirements, schedules, and safety management issues, the Board will need to augment its technical staff with individuals who possess the necessary expertise.

The Rocky Flats Environmental Technology Site will be the first large-scale defense nuclear site to face total deactivation. All nuclear materials are scheduled to be removed from the site by 2006. The Board will need to continue its close oversight of DOE's progress toward deactivation of Rocky Flats, since a significant threat to worker safety arises as a result of the change in work activities from practices associated with production to less familiar and potentially more hazardous

deactivation and decontamination tasks. In addition, the experience gained there has the potential to serve as a model for deactivation of the considerable number of excess facilities in the DOE complex.

The mission to conduct high-risk activities associated with facility deactivation will continue across the DOE defense nuclear complex at an increasing rate in the coming years. These activities involve hands-on, hazardous work that requires hazards evaluation, development of work controls and procedures, worker training, and conduct of operations. The Board's continued attention and commitment of resources will be required to ensure that DOE safely conducts these high-risk activities.

In response to the Board's urging and guidance, DOE has made considerable progress toward the development of programmatic direction for an Integrated Safety Management (ISM) approach to its hazardous nuclear activities. However, independent internal DOE reviews, as well as observations by the Board and its staff, indicate that extensive experience, feedback, and improvement will be required before effective implementation of ISM and its associated cultural changes are fully realized across the entire DOE defense nuclear complex. The Board will need to devote significant resources to oversight of DOE and its contractors to ensure that the ISM gains already achieved are continued.

Following considerable oversight and constructive engagement by the Board, DOE is currently in a peak period of activity for stabilization and disposition of the hazardous remnants of nuclear weapons production. Substantial progress is being made toward characterizing, stabilizing, and dispositioning high hazard nuclear materials, and several associated new facilities are either in design, construction, or initial operation. However, recent reviews have indicated that DOE is encountering difficulty in maintaining its momentum in this important arena of risk reduction. The Board will continue to urge DOE to restore the earlier pace of its activities associated with these new and inherently hazardous activities.

Congress, in the National Defense Authorization Act for Fiscal Year 2001, directed that before funding can be used to commence decommissioning of the F-Canyon chemical separations facility at the Savannah River Site, the Department of Energy and the Board must jointly declare that specific conditions have been met demonstrating that the facility is no longer required. The Board is performing a review of complex-wide legacy nuclear material issues, including materials not addressed by Recommendations 94-1 and 2000-1, to provide the technical basis for evaluating such a declaration.

Since the end of the Cold War, maintaining the technical competence of Federal and contractor personnel essential to DOE's defense nuclear mission has been an increasingly difficult task. While the Board has always placed considerable emphasis on this vital aspect of safety management, skilled employees continue to leave the workforce. The turnover in senior DOE leadership that resulted from the years of Government downsizing and curtailed investments in human capital will necessitate close attention to rebuilding the appropriate technical skills, abilities, and experience. The Board will need to apply significant resources to ensure that DOE recruits and develops the required technical capabilities and that the new line management emphasizes safety in the conduct of its operations.

Work in the above areas is essential to the fulfilment of the Board's mission and is assumed in its strategic planning. The Board's resources are already fully committed to existing safety activities, and accommodating this additional work will be challenging within the budget. The Board is recruiting technical personnel having additional and varied safety expertise to address the changing and expanding scope and nature of DOE's planned work, as well as to meet our own workforce succession planning needs.

5. CONCLUSION

In establishing the Board, Congress and the President intended that the Board assure and improve the safety of operations of DOE's defense nuclear facilities by providing independent, expert advice to the Secretary of Energy, identifying the nature and consequences of any significant potential threats to public health and safety, and elevating such issues to the highest levels of authority.

The five full-time Board Members, together with a small but highly competent staff, provide a cost-effective organizational arrangement for achieving the added safety assurance that the public seeks and rightfully expects. The Board's budget request of \$19,494,000, to be used for staff salaries and required overhead expenses, such as travel to DOE's defense nuclear facilities and maintaining our on-site presence with the Board's site representatives, will provide the funding needed to support the health and safety review actions planned by the Board for Fiscal Year 2003. This amount constitutes a wise investment towards 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.

STATUTORY MISSION OF THE BOARD

Congress established the Defense Nuclear Facilities Safety Board (Board) in Public Law 100–456 of September 29, 1988. Created as an independent establishment within the Executive Branch, the Board is made up of five Members appointed from civilian life by the President, by and with the advice and consent of the Senate. The Board’s enabling statute requires that the Board Members be respected experts in the field of nuclear safety with demonstrated competence and knowledge relevant to the independent investigation and oversight functions of the Board. The Senate confirmed the first five Board Members on October 19, 1989. The statutory mission of the Board includes the following major functions:

- **Review and Evaluation of Standards.** The Board shall review and evaluate the content and implementation of the standards relating to the design, construction, operation, and decommissioning of defense nuclear facilities of the Department of Energy (DOE), including all applicable DOE Orders, regulations, and requirements at each Department of Energy defense nuclear facility. The Board shall recommend to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected. The Board shall include in its recommendations necessary changes in the content and implementation of such standards, as well as matters on which additional data or additional research is needed.
- **Investigations.** The Board shall investigate any event or practice at a Department of Energy defense nuclear facility which the Board determines has adversely affected, or may adversely affect, public health and safety.
- **Analysis of Design and Operational Data.** The Board shall have access to and may systematically analyze design and operational data, including safety analysis reports, from any Department of Energy defense nuclear facility.
- **Review of Facility Design and Construction.** The Board shall review the design of a new Department of Energy defense nuclear facility before construction of such facility begins and shall recommend to the Secretary of Energy, within a reasonable time, such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety. During the construction of any such facility, the Board shall periodically review and monitor the construction and shall submit to the Secretary of Energy, within a reasonable time, such recommendations relating to the construction of that facility as the Board considers necessary to ensure adequate protection of public health and safety. An action of the Board, or a failure to act, under this paragraph may not delay or prevent the Secretary of Energy from carrying out the construction of such a facility.

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

OBJECT CLASS SUMMARY

Estimated obligations for FY 2001, projected obligations for FY 2002, and the Board's Budget Request for FY 2003, 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 2003 expenditure request includes funding of \$14,631,000 to support the projected salary and benefit costs for 102 FTEs. The funding for salaries and benefits represents 75 percent of the Board's FY 2003 Budget Request. 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 4.6 percent beginning in January 2002.
- Pay increase of 2.6 percent beginning in January 2003.
- Employee benefits of 28 percent of salaries, or \$31,793 per FTE in FY 2003.

The Administration has recently submitted a legislative proposal to Congress that would increase agency costs for accruing employee CSRS pension costs and annuitant health benefits for all employees, while reducing reported costs from central mandatory accounts by an equal amount. (Please see Exhibit B for an explanation of the Administration's legislative proposal.) The estimated cost of this proposal for the Board would require an additional \$494,000 in budget authority for FY 2003. For comparison purposes, comparability estimates for FY 2001 and FY 2002 are calculated below:

	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>
Civil Service Retirement System Employees (CSRS)	\$155,000	\$162,000	\$169,000
Federal Employee Health Benefits (FEHB)	<u>\$251,000</u>	<u>\$292,000</u>	<u>\$325,000</u>
TOTAL	\$406,000	\$454,000	\$494,000

In establishing the Board, Congress sought to bring the very 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 has and will continue to be critical to the successful accomplishment of the Board's mission. The Board has assembled a small 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 weapons safety, storage of nuclear materials and nuclear criticality safety, and waste management. As an indication of the Board's technical talent, 92 percent of the Board's

Defense Nuclear Facilities Safety Board

FY 2003 CONGRESSIONAL BUDGET REQUEST - 01/30/02

BUDGET ACCOUNT	COST ELEMENT	ACTUAL FY 2001 OBLIGATIONS	FY 2002 FINANCIAL PLAN	FY 2003 PROJECTED BUDGET REQUEST
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PERSONNEL SALARIES -- (11)		\$ 9,343,699	\$ 10,804,000	\$ 11,394,404
PERSONNEL BENEFITS -- (12)		\$ 2,488,557	\$ 2,770,386	\$ 3,242,917
TRAVEL -- (21)		\$ 579,221	\$ 576,000	\$ 576,000
TRANSPORTATION OF THINGS -- (22)		\$ 137,273	\$ 135,000	\$ 75,000
RENTAL PAYMENTS TO GSA -- (23.1)		\$ 2,316,000	\$ 2,409,000	\$ 2,505,000
COMMUNICATIONS & UTILITIES (23.3)		\$ 161,213	\$ 194,000	\$ 194,000
PRINTING & REPRODUCTION -- (24)		\$ 33,158	\$ 35,000	\$ 35,000
CONSULTING SERVICES -- (25.1)		\$ 1,710,571	\$ 1,000,000	\$ 1,000,000
OTHER SERVICES -- (25.2)		\$ 1,962,549	\$ 939,000	\$ 939,000
GOVERNMENT SERVICES -- (25.3)		\$ 198,309	\$ 264,000	\$ 264,000
SUPPLIES & MATERIALS -- (26)		\$ 268,965	\$ 204,000	\$ 204,000
CAPITAL ASSETS -- (31)		\$ 333,665	\$ 282,000	\$ 282,000
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*** TOTAL OBLIGATIONS ***		\$ 19,533,181	\$ 19,612,386	\$ 20,711,321
NEW BUDGET AUTHORITY		\$ 18,458,000**	\$ 18,500,000	\$ 19,494,000
UNOBLIGATED BALANCE - PREV. FY		\$ 2,042,873	\$ 2,687,460	\$ 1,575,074
RECOVERY OF PRIOR YR OBLIGATIONS		\$ 1,719,768	\$ -	\$ -
TOTAL BUDGETARY RESOURCES		\$ 22,220,641	\$ 21,187,460	\$ 21,069,074
EST. UNOBLIGATED BAL. - CUR. FY		\$ 2,687,460	\$ 1,575,074	\$ 357,753
APPROPRIATION		\$ 18,458,000	\$ 18,500,000	\$ 19,494,000
OUTLAYS		\$ 17,706,462	\$ 18,500,000	\$ 19,400,000
STAFF & BOARD MEMBERS (FTE'S)		93	102	102

**\$18,500,000 appropriation; \$42,000 rescission

Reserve for Fully Accruing Federal Employees Retirement

The President's 2003 Budget corrects a long-standing understatement of the true cost of literally thousands of government programs. For some time, the accruing charge of the Federal Employee Retirement System (FERS) and Military Retirement System (MRS) costs and a portion of the old Civil Service Retirement System (CSRS) costs has been allocated to the affected salary and expense accounts, and the remainder (a portion of CSRS, other small retirement systems, and all civilian and military retiree health benefits) has been charged to central accounts. The full cost of accruing benefits should be allocated to the affected salary and expense accounts, so that budget choices for program managers and budget decision makers are not distorted by inaccurate cost information.

The Budget presents the amounts associated with shifting this cost from central accounts to affected program accounts, starting in 2003. The amounts associated with the proposal are shown on a comparable basis for program accounts in 2001 and 2002. Agencies will also, for the first time, be charged for the accruing cost of retiree health care benefits for all civilian employees. These are also shown on a comparable basis for 2001 and 2002. For military retirees health benefits, current law requires agencies to be charged for the accruing cost for over-age 64 military retirees, and the budget proposes to extend this to under-age 65 military retirees in 2004. These amounts are shown in the Budget, beginning in 2004.

The proposal does not increase or lower total budget outlays or alter the surplus/deficit since the higher payments will be offset by receipts in the pension and health funds. The shift will reduce reported costs from central mandatory accounts and increase reported costs in the affected discretionary accounts. Consequently, these costs will be properly reported in the budget for the first time and considered as an annual cost of managing these programs, as they should be.

The Administration will oppose any attempt to divert the additional funding from the intended purpose and instead use it to fund programmatic increases. Therefore, the Administration proposes that the additional funding be fenced or held in a reserve and only be made available to the committees of jurisdiction for the specific purpose of adjusting for the understatement of costs.

This change in treatment of costs is the first in a series of steps that will be taken to ensure that the full annual cost of resources used -- including support services, capital assets and hazardous waste -- is charged properly in the budget presentation.

technical staff hold advanced degrees, of which 30 percent are at the Ph.D. level. Almost all technical staff members, except interns, 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. It is of paramount importance that the Board receive 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. Two full-time site representatives are stationed at the Pantex site to oversee nuclear weapons activities, including the weapons stockpile stewardship and weapons disassembly programs, and two site representatives are stationed at the Hanford site to monitor waste characterization and stabilization and facility deactivation. The Board has assigned one full-time site representative at Rocky Flats to monitor the DOE effort to deactivate facilities and stabilize/store the large plutonium inventory at the site, and two site representatives at the Savannah River Site to monitor the DOE's efforts to deactivate facilities, stabilize waste materials, and store and process tritium. The Board also has assigned two full-time site representative to monitor safety and health conditions at Oak Ridge Y-12 and other defense nuclear facilities in this area.

Because of increased activity and future NNSA plans, the Board established an on-site presence at the Los Alamos National Laboratory (LANL) in August 2001. The site representative advises the Board on overall safety and health conditions at LANL, and participates in the conduct of reviews and evaluations by the Board related to the design, construction, operation, and decommissioning of defense nuclear facilities. By adding a site representative at LANL, the Board is able to better perform its health and safety oversight responsibilities at this lab.

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 first-hand 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 \$576,000 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 fulfill the Board's statutory mission. 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 approximately 177 team visits during FY 2001 to major defense nuclear sites in support of its high priority public health and safety 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.

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 inquiry.

Transportation of Things. The Board has included \$75,000 in its FY 2003 Budget Request for the shipment of household goods for employees relocating to the Washington, DC area or to DOE sites.

Rental Payments to GSA. The Board requests funds totaling \$2,505,000 to reimburse the General Services Administration (GSA) for projected office rental costs. This overhead expense represents approximately 13 percent of the Board's FY 2003 Budget Request.

Communications and Utilities. The FY 2003 Budget Request includes \$194,000 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.

Printing and Reproduction. The budget request includes \$35,000 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 the Congress and technical reports, are also included in this account.

Consulting Services. Although authorized by Congress and the President to have up to 150 FTEs, due to budgetary constraints, the Board had only 93 full-time staff onboard as of January 30, 2002. While the Board employs a highly capable staff, it is not practical or desirable to have permanent staff skilled in every specialty for which needs occur. For example, following several reviews at Pantex, the Board concluded that the potential hazards from lightning to nuclear explosive operations had not been adequately addressed by DOE. As this situation is unique to the weapons-related activity at certain NNSA sites, outside contractor expertise in the area of lightning protection was acquired to assist the Board in its reviews.

The Board plans to continue to obtain outside technical experts in highly specialized areas. Expertise on the assembly and disassembly of certain specific nuclear weapon components has and will continue to be needed on a period basis. Such expertise may be required for short periods with little advance notice should an imminent or severe threat to public health and safety be identified at a DOE defense nuclear facility. Therefore, it is extremely important to have the funds necessary to immediately contract for this expertise when needed. Each outside 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 is included in Appendix C. The FY 2003 Budget Request includes \$1,000,000 in this account for technical support contracts to assist the Board in its health and safety reviews.

Other Services. The budget request includes \$939,000 to fund the recurring administrative support needs of the Board in FY 2003 such as security services, court reporting expenses, employee training, records storage and retrieval services, and computer network maintenance.

Government Services. The Board's budget request includes \$264,000 to pay the cost of reimbursable support agreements with other federal agencies for administrative services such as accounting, payroll, health unit, and drug-free workplace testing and support.

Supplies and Materials. The Board requests \$204,000 to maintain the technical reference information for its in-house library, as well as for continued access to various technical computer databases, and for general office supplies and materials.

Equipment. The FY 2003 Budget Request includes \$282,000 to maintain the Board's information technology (IT) security and infrastructure. The Board will purchase upgraded fire-wall protection, improved communications equipment and demonstration technologies to support not only the technical and legal staffs' travel to various defense nuclear sites, but also the daily operations of the Board. In addition, the Board will continue to replace older equipment that has reached the end of its life cycle and expend funds for improvements to technologies that provide a greater outreach to the public.

TECHNICAL SUPPORT CONTRACTS SUMMARY

A list of major technical support contracts, with a brief description of each contractor's areas of expertise, is included in this Appendix. The FY 2003 Budget Request includes \$1 million 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 12/31/01)

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Mr. Richard Collier	09/30/02	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.
Dr. Herbert Kouts	12/31/02	Provide technical expertise on a wide range of subjects associated with safety at DOE's defense nuclear facilities, including: safety management, criticality, DOE's stabilization, storage and disposition of nuclear materials, nuclear reactor physics, 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	12/31/02	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 recent work include: evaluation of technologies to stabilize plutonium residues, plutonium storage safety issues, and Rocky Flats plutonium stabilization activities.
Dr. James L. Liverman	04/30/02	Provide technical support to the Board in the general subject area of radiation protection, specifically involving review and evaluation of DOE's Implementation Plan for Board Recommendation 91-6, amendments to 10 CFR 835 Rule, radiological protection standards, and other radiological and environmental health and safety issues.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Lary M. McGrew	01/31/02	Provide expertise related to the strategic 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.
Management Support Technologies, Incorporated	02/28/02	Provide technical support to the Board, specifically involving evaluation of policies, standards, and procedures governing operations and maintenance and the training and qualification programs for operations, technical support, and maintenance personnel. Assist the staff in evaluating the DOE's development and implementation of Integrated Safety Management guidance in response to Board Recommendation 95-2. Assist staff in assessing operations and maintenance at DOE defense nuclear facilities.
Paul C. Rizzo Associates, Inc.	12/31/02	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 Engineer	12/31/02	Provide technical support to the Board, specifically in the review and evaluation of systems and seismic engineering 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 analyses performed by DOE contractors; and hazard and systems classification.
Briere Associates, Inc.	09/30/02	Provide technical editing services of Board documents that include, but are not limited to technical reports, trip reports, the Annual Report to Congress, and Board Recommendations to the DOE. These services include analyzing manuscripts in terms of objective, style, and manner of presentation and recommend revisions as appropriate.

Outside Technical Contracts by Fiscal Year



ANNUAL PERFORMANCE PLAN FOR FY 2003

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.

As outlined in the Board's Strategic Plan (available on the Internet at www.dnfsb.gov), the Board's statutory mission is logically divided along the lines established by the three general goals:

- 1. Complex-Wide Health and Safety Issues.** Integrated safety management (including comprehensive health and safety requirements, technically competent personnel, and effective implementing mechanisms) continues to evolve through feedback and improvement, and is implemented in all life cycle phases—design and construction, startup, operation, and decommissioning.
- 2. Safe Stewardship of Nuclear Weapons Stockpile and Components.** Nuclear weapons stockpile support and defense nuclear research activities continue to be planned and executed safely at DOE's defense nuclear facilities.
- 3. Safe Disposition of Hazardous Remnants of Weapons Production.** Hazardous remnants of nuclear weapons production are appropriately characterized, stabilized, and stored; and legacy facilities are decommissioned in a manner that protects the worker, the public, and the environment.

The Board's Strategic Plan establishes the framework for making management decisions, and describes what the Board plans to do each year to progress toward achievement of each of these three general goals. In planning its work, the Board and its staff have developed a set of seven strategic objectives that, in aggregate, implement the Board's general goals. The relationship between these goals and objectives is discussed in the Board's Strategic Plan.

To facilitate strategic management, the Board has organized its technical staff into three groups. The technical lead of each group is assigned responsibility for one of the three general goals in the Strategic Plan, and for executing the strategic 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 and its technical leadership have produced measurable performance goals for fiscal year (FY) 2002 and FY 2003 that, when executed, will demonstrate continued progress toward the Board's strategic objectives, and consequently toward its general goals. These annual performance goals and measures establish projected levels of performance and reflect the nature of the Board's independent oversight function.

APPENDIX D

All of the Board's general goals and objectives 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 2003 identifies annual performance goals for each strategic objective that consist of reviews to be conducted in support of each objective, plus the identification of candidate areas for these reviews. An outcome measure for each objective is described as part of the discussion of each annual performance goal. Qualitative assessments of the outcome associated with each annual performance goal are provided in 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.
- 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 worker, and/or 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 experience, developed during the last 12 years of reporting progress to Congress in the Board's Annual Reports, has shown that it is possible to conduct a retrospective assessment of Board-identified issues and associated DOE responses that demonstrates the Board has had a clear and positive impact on the safety culture within DOE.

Because of the variability of DOE's plans and schedules, some candidate areas identified in the Board's Annual Performance Plans 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 Appendix D are formatted to show the flow-through from the general goals set forth in the Board's Strategic Plan to strategic goals and objectives and specific annual performance goals for FY 2002 and FY 2003. To place this planning information in context, the tables also provide examples of the Board's related FY 1999, FY 2000 and FY 2001 accomplishments, as required by OMB's guidance on Performance Plans. These examples do not represent the entire scope of progress made on the FY 2001 performance goals. A comprehensive assessment of progress during calendar year (CY) 2000 appears in the Board's Eleventh Annual Report. The Twelfth Annual Report, due for publication in early 2002, will cover accomplishments during CY 2001.

STRATEGIC GOAL 1: COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Continuing evolution of Integrated Safety Management (ISM) (including comprehensive health and safety requirements, technically competent personnel, and effective implementing mechanisms) through feedback and improvement, and full implementation of ISM in all life cycle phases—design and construction, startup, operation, and decommissioning.

The first goal addresses the agency's efforts to facilitate the complex-wide implementation of integrated safety management throughout the DOE defense nuclear complex. Achieving this goal requires a multi-year, multi-site, multi-focus effort. The three strategic objectives that support the general goal encompass a broad spectrum of technical areas relevant to the safety of DOE's defense nuclear mission.

Strategic Objective 1–A: Improvement and Integration of Health and Safety Directives. The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public. (See pages D-4 through D-8)

Strategic Objective 1–B: Technical Competence. The Board and its staff 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. (See pages D-9 through D-13)

Strategic Objective 1–C: Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation. The Board and its staff will verify the effective and expeditious development and implementation of DOE's ISM program. (See pages D-14 through D-19)

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1–A:	<u>Improvement and Integration of Health and Safety Directives.</u> The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.
Examples of FY 1999 Accomplishments	
<p>The Board and its staff provided substantive comments to DOE during the review process for three health and safety directives associated with deactivation and decommissioning. After successfully resolving the Board's comments, DOE updated one of these directives. At years end, both staffs were completing resolution of issues in the two remaining directives to improve content, clarity, and consistency of the guidance.</p>	
<p>The Board's staff provided comments on thirteen draft implementation guides associated with 10 CFR 835, <i>Occupational Radiation Protection</i>, DOE-STD-1098-99, <i>Radiological Control Standard</i>, and two handbooks associated with the DOE radiological protection program. The staff then worked with the DOE staff to resolve the identified areas of needed improvement. By year's end, DOE had issued all thirteen implementation guides and both handbooks, and had sent the standard to the DOE Technical Standards Program for publication. These actions resulted in clarifying and strengthening DOE's guidance for this important safety management function.</p>	
<p>The Board provided comments to DOE on a new guide on management of Quality Assurance, a new qualification standard for individuals engaged in criticality safety studies, and a new handbook addressing design considerations, all three of which are explicitly associated with integrated safety management. Through significant interaction between the Board's staff and their DOE counterparts, significant improvements in the content and clarity of the directives were achieved.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-A:	<p><u>Improvement and Integration of Health and Safety Directives.</u> The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.</p>
Examples of FY 2000 Accomplishments	
<p>The Board and its staff provided substantive comments to DOE during the review process for 44 directives associated with, but not limited to, integrated safety management, chemical safety, nuclear explosive operations, and technical personnel training and qualification. At year's end, both staffs were completing resolution of issues on several remaining directives to improve the content, clarity, and consistency in safety guidance.</p>	
<p>The Board and its staff provided comments to DOE during the review process on the draft <i>Chemical Management Handbook</i>. The preliminary draft was unacceptable, lacking proper integration with integrated safety management concepts. As a result of suggestions from the Board's staff, the rewritten handbook incorporates integrated safety management, the applicable DOE standards, and other government agency regulations to allow ease of contractor use.</p>	
<p>Following the issuance of DOE-DP-STD-3016-99, <i>Limited Standard, Hazard Analysis Reports for Nuclear Explosive Operations</i>, the Board's staff interacted directly with the Pantex contractor in preparing an Authorization Basis Manual that described in more detail the format and content of the Hazard Analysis Report, as well as the analytical process, in preparation for nuclear explosive operations. This will significantly improve the quality of the authorization basis for nuclear explosive operations including clear identification of the necessary safety controls.</p>	
<p>During 2000, DOE G 450.4-1, <i>Integrated Safety Management Guide</i> was revised to incorporate a major new section dealing with how to maintain a site's Integrated Safety Management system following initial implementation. Significant involvement of the Board and its staff was key to the development of the approach as well as the revision to DOE G 450.4-1. This new guidance will help to ensure the sites' ISM systems are maintained current and continue to improve.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-A:	<p><u>Improvement and Integration of Health and Safety Directives.</u> The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.</p>
Examples of FY 2001 Accomplishments	
<p>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.</p>	
<p>Nuclear Safety Rule. The "Nuclear Safety Rule" (10 CFR 830, <i>Nuclear Safety Management</i>) 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.</p>	
<p>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, <i>Nuclear Explosive and Weapon Surety Program</i>; and DOE Order 452.2B, <i>Safety of Nuclear Explosive Operations</i>. Both these Orders were issued in August 2001.</p>	
<p>Safety Management Functions, Responsibilities, and Authorities Manual. The Board reviewed a draft revision to DOE Manual 411.1-1B, <i>Safety Management Functions, Responsibilities, and Authorities Manual</i>, 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, <i>Nuclear Safety Management</i>.</p>	
<p>Contractor System Engineers. The Board provided significant comments to draft Change 4 to DOE Order 420.1A, <i>Facility Safety</i>, which is being revised to define requirements for contractor System Engineers in response to Board Recommendation 2000-2, <i>Configuration Management, Vital Safety Systems</i>. 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.</p>	
<p>Special Tritium Compounds. The Board's April 29, 1999 letter requested information regarding DOE's approach for a radiation protection program for work involving special tritium compounds (STCs) such as metal tritides and organically bound tritium. During the last two years, DOE has conducted technical evaluations, drafted guidance, and developed a documented approach that provides an adequate basis for protecting workers, the public, and the environment from exposure to STCs. A more formal and institutionalized radiation protection approach is expected to be made through an amendment to 10 CFR Part 835, <i>Occupational Radiation Protection Rule</i> and the issuance of DOE guidance documents.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

<p>Objective 1–A:</p>	<p><u>Improvement and Integration of Health and Safety Directives.</u> The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.</p>
<p>FY 2002 Performance Goals</p>	
<p>The Board and its staff will continue to review and assess the adequacy of health and safety requirements in new directives and rules, as well as in specific DOE directives that may be revised as a result of DOE's two-year review cycle. Results will be communicated to DOE by the Board or its staff for incorporation or resolution, as appropriate.</p> <p>It is estimated that DOE will issue a minimum of 36 directives for review by the Board and its staff in FY 2002. Approximately 3 of these reviews are expected to be of major significance, requiring substantial Board and staff interaction with DOE to satisfactorily resolve identified issues prior to finalization.</p> <p>The Board will continue to encourage DOE to develop necessary new directives and to improve, consolidate, and integrate existing requirements and guidance related to health and safety, especially those directives and rules aimed at the integration of safety management throughout the entire life cycle of major projects. In this regard, the Board intends to pay particular attention to how DOE articulates its requirements and guidance applicable to new capital acquisitions and complex-wide programs involving multiple program offices, especially in the following areas:</p> <ul style="list-style-type: none"> • Effective conduct of hazardous facility, site and complex-wide projects and programs, including roles, responsibilities, competencies, mechanisms, and training, • Safety and hazard analyses, • Quality Assurance, including Software Quality Assurance. <p>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.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1–A:	<u>Improvement and Integration of Health and Safety Directives.</u> The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.
FY 2003 Performance Goals	
<p>In its review of DOE's ongoing biennial review cycle of its directives, the Board and its staff will continue to assess the adequacy of those directives to ensure that any proposed revisions are appropriate and adequate. The results of reviews completed by the Board and its staff will be provided to DOE for consideration and action.</p> <p>The Board anticipates that approximately 30 DOE directives will require review, of which 2 or 3 are likely to have major significance. For those few in this category, significant effort by the Board and its staff is expected to be needed to ensure satisfactory resolution of identified issues.</p> <p>DOE's program for the maintenance and upgrading of its directives is expected to have reached a stage of relative maturity by FY 2003, particularly those directives aimed at integrated safety management. The Board and its staff will continue to scrutinize proposed changes in requirements and guidance set forth in DOE's directives program to ensure that there is no reduction in their rigor. In this regard, the Board and its staff will be especially attentive to those requirements and guidance associated with facility safety during operation and in post-operation activities, especially in the content of authorization basis documentation for new facilities or those undergoing major renovation or mission changes.</p> <p>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.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-B:	Technical Competence. The Board and its staff 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.
Examples of FY 1999 Accomplishments	
<p>The Board continued to focus DOE's attention on the technical competence of Federal workers as an essential safety element for defense nuclear facilities. Through a revised Implementation Plan for Board Recommendation 93-3, <i>Improving DOE Technical Capability in Defense Nuclear Facilities Programs</i>, DOE formed a panel of senior line managers to implement a corporate program to recruit, develop, deploy, and retain technical capability at defense nuclear facilities. The panel members self-assessed the Technical Qualification Programs at their respective sites, and took the necessary actions to upgrade their plans and procedures. The panel also identified 686 critical technical positions and took administrative actions to preserve nearly all of these positions against downsizing efforts.</p> <p>Significant accomplishments were made by DOE as a result of implementing Board Recommendation 97-2, <i>Criticality Safety</i>. Training and qualification programs for both DOE and contractor criticality engineers were established including high quality qualification standards. The operation of the Los Alamos National Laboratory critical facility was revamped for training of criticality safety engineers and for the development of intermediate range neutron energy data for critical assemblies. These activities provide vital information for understanding and characterizing the unique hazards and for developing proper safety controls related to nuclear criticality. Additionally, a web-site was developed for dissemination of archived data on the past 40 years of criticality experiments which will provide great benefit to the nuclear safety community.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1–B:	Technical Competence. The Board and its staff 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.
Examples of FY 2000 Accomplishments	
<p>The Board continued to focus DOE’s attention on the technical competence of Federal workers as an essential safety element for defense nuclear facilities. Through a revised Implementation Plan for Board Recommendation 93-3, <i>Improving DOE Technical Capability in Defense Nuclear Facilities Programs</i>, a DOE formed panel of senior line managers continued to implement a corporate program to recruit, develop, deploy, and retain technical capability at defense nuclear facilities. Many changes in DOE’s mission and -infrastructure have occurred since the Board issued Recommendation 93-3. The Board believes that DOE’s efforts in response to this recommendation have resulted in excellent programs and processes that will be invaluable in the training and qualification of the next generation of the DOE federal workforce. On November 9, 1999, the Board closed Recommendation 93-3.</p>	
<p>The Board and its staff continued to engage DOE in regard to the development of formal training and qualification for federal and contractor criticality safety personnel resulting in the upgrade of DOE Order 420.1, <i>Facility Safety</i>, emphasizing this important aspect of criticality safety. Also, in response to Board staff concerns about the floor presence of criticality engineers, DOE directed that criticality engineers increase the number of hours spent observing work on the floor, and report these hours to headquarters and program offices responsible for the site.</p>	
<p>The Board and its staff continued to interact directly with cognizant DOE representatives to ensure a satisfactory path to closure of Board Recommendation 97-2, <i>Continuation of Criticality Safety</i>, especially with regard to the development of an adequate curriculum and the criticality safety training of sufficient numbers of contractor and federal employees.</p>	
<p>Working closely with the Board and its staff, DOE has upgraded DOE Order 360.1A, <i>Federal Employee Training</i>, and DOE-STD-1063-2000, <i>Facility Representatives</i>, as elements of the revised Implementation Plan for Board Recommendation 93-3, <i>Improving DOE Technical Capability in Defense Nuclear Facilities Programs</i>. DOE further institutionalized its technical personnel processes with the issuance of DOE M 426.1-1, <i>Federal Technical Capability Manual</i>.</p>	
<p>The Board emphasized the vital importance that a technically-competent workforce plays in ensuring public and worker health and safety.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-B:	<p>Technical Competence. The Board and its staff 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.</p>
Examples of FY 2001 Accomplishments	
<p>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 Board's 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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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, <i>Configuration Management, Vital Safety Systems</i>. As a result, DOE has drafted a significant modification to DOE Order 420.1, <i>Facility Safety</i>, 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.</p>	
<p>Nuclear Criticality Safety Program. In FY 2001, DOE reported the completion of its implementation plan for Recommendation 97-2, <i>Nuclear Criticality Safety</i>, 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, <i>Criticality Safety at Department of Energy Defense Nuclear Facilities</i>, 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.</p>	
<p>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, <i>Nuclear Criticality Safety</i>.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-B:	Technical Competence. The Board and its staff will verify that roles, responsibilities, experience, and competencies required to protect the workers and the public are explicitly defined and implemented for both DOE and its contractor personnel.
FY 2002 Performance Goals	
<p>The Board and staff will conduct at least five assessments from among the following types:</p> <ul style="list-style-type: none"> • Review and evaluate the effectiveness of the system engineers program in the Federal and contractor work force, in accordance with DOE's Implementation Plan for Board Recommendation 2002-2, <i>Configuration Management of Vital Safety Systems</i>. • Assess whether competence is commensurate with assigned responsibilities for key safety management personnel at defense nuclear contractor organizations as part of scheduled DOE and contractor readiness determinations. • Investigate the integration of human factors engineering principles with respect to the design, operation, and maintenance of defense nuclear facilities, with emphasis on implementation, use, appropriateness, and effectiveness of administrative controls in lieu of safety-class passive design features and engineered safety features. • Evaluate the degree to which DOE and its contractors have implemented measures to ensure a viable criticality safety infrastructure, including progress toward qualification of contractor criticality safety engineers, through DOE site reviews. • Assess the effectiveness of DOE's project manager qualification program at DOE headquarters office and DOE sites, including its depth and level of technical rigor. <p>Results of assessments will be communicated to DOE to enhance understanding of safety-related roles and responsibilities in support of DOE's execution of functions associated with protecting the worker and the public, and to be used by DOE to upgrade the quality of its technical workforce.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1–B:	<u>Technical Competence.</u> The Board and its staff will verify that roles, responsibilities, experience, and competencies required to protect the workers and the public are explicitly defined and implemented for both DOE and its contractor personnel.
FY 2003 Performance Goals	
<p>The Board and staff will conduct at least four assessments from among the following types:</p> <ul style="list-style-type: none"> • Assess whether competence is commensurate with assigned responsibilities for key safety personnel at defense nuclear contractor organizations involved in such areas as, but not limited to, fire protection engineers, system engineers, or radiation protection personnel. • Investigate the integration of human factors engineering principles with respect to the design, operation, and maintenance of defense nuclear facilities, and with emphasis on implementation, use, appropriateness, and effectiveness of administrative controls in lieu of safety-class passive design features and engineered safety features. Site reviews will be conducted to provide specific details regarding the status of human factors engineering issues in the DOE complex. • Assess the effectiveness of DOE’s project manager qualification program at DOE headquarters office and DOE sites, including its depth and level of technical rigor. • Evaluate the degree to which DOE and its contractors have implemented measures to ensure a viable criticality safety infrastructure, including progress toward qualification of contractor criticality safety engineers, through DOE site reviews. <p>Results of assessments will be communicated to DOE to enhance understanding of safety-related roles and responsibilities in support of DOE’s execution of functions associated with protecting the worker and the public, and to be used by DOE to upgrade the quality of its technical workforce.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-C:	<u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u> The Board and its staff will verify the effective and expeditious development and implementation of DOE's Integrated Safety Management (ISM) program.
Examples of FY 1999 Accomplishments	
<p>Reviews by the Board and its staff identified shortcomings in the Hanford Spent Nuclear Fuel Project that included the continued lack of sound project management, despite several high level management changes; poor implementation of quality assurance requirements; and an inability to identify and resolve emerging technical issues in a timely manner. Continued Board and staff pressure through correspondence and face-to-face meetings has led to some progress on these concerns, but continuing attention is needed.</p> <p>Several key indicators for gauging progress in implementing ISM have been identified from the Board's reviews: Incorporation of ISM-related Department of Energy Acquisition Regulation (DEAR) clauses into contracts, establishment of a mutually agreed-upon requirements base as the foundation for the ISM program, development of an ISM System description that describes how the contractor will integrate the system into work practices, performance of a DOE ISM verification review, and establishment of an authorization agreement. Each of these areas received Board attention in FY 1999, not only at the 10 priority facilities called out in the Recommendation 95-2 DOE Implementation Plan but also in the 43 facilities designated in the Board's December 1997 letter as "follow-on" facilities. During the FY 1999, DOE worked to fully implement ISM at the Recommendation 95-2 priority facilities. The Board monitored and advised on the development of DEAR Clause-required ISM descriptions, which describe how the contractor will integrate ISM into work practices. To date, all sites with priority or follow-on facilities have had their ISM descriptions approved by DOE, except Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and the Pantex Plant, which are scheduled for approval by the end of the year. The Board also urged DOE to continue its efforts to define and operate to explicit control measures at the priority facilities, and enlarge its efforts to include all high and moderate hazard defense nuclear facilities. In his March 1999, memorandum on Safety-Accountability and Performance, the Secretary of Energy committed to having ISM completely in place for all DOE facilities by September 2000.</p> <p>In response to the Board's March 20, 1998, reporting requirement on the DOE's Feedback and Improvement Program, DOE committed to upgrading the DOE Lessons Learned process, including developing guidance on improving the complex-wide feedback and improvement programs. In addition, DOE published a revised DOE acquisition regulation that will hold a contractor's fee at risk in the event of poor safety performance. The Secretary of Energy's March 3, 1999, memorandum on Safety-Accountability and Performance tasked the newly established DOE Safety Council with developing performance standards that will be used to hold Federal personnel accountable for effective and timely ISM implementation. The Board worked closely with DOE in this effort.</p> <p>The Board issued Recommendation 98-1 to address the internal independent oversight element of the feedback and improvement program that the Board felt was not being adequately addressed in DOE's feedback and improvement initiatives. The Board determined that DOE's independent assessments of safety management in the field were treated largely as advisories and follow-up actions became discretionary to lower levels of DOE line management. DOE accepted this Recommendation and provided an acceptable Implementation Plan, which addresses DOE's need for a clearly defined, systematic, and comprehensive process to address and resolve safety issues identified by internal independent oversight</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-C:	<u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u> The Board and its staff will verify the effective and expeditious development and implementation of DOE's Integrated Safety Management (ISM) program..
Examples of FY 2000 Accomplishments	
<p>Review of the preliminary design package for the Tritium Extraction Facility (TEF) project by the Board and its staff disclosed that the preliminary design did not appear to have fully implemented the hierarchy of safety controls consistent with the site's manuals of practice, and that additional consideration of this matter was merited in developing the final TEF design. For example, there appeared to be an over-reliance on administrative controls being used instead of engineered design features to provide safety functions. DOE accepted the Board's suggestions and agreed to incorporate them in the final design.</p>	
<p>Reviews of the Hanford Spent Nuclear Fuel Project by the Board's staff identified safety issues related to safety-related ventilation systems and electrical systems at the Cold Vacuum Drying Facility. DOE addressed these issues, including addition of a diesel generator to supply safety significant power to the exhaust fans for the ventilation system, further enhancing the safety of the facility.</p>	
<p>The Board and its staff conducted a series of review meetings on the design of the Pit Disassembly and Conversion Facility (PDCF) that identified to DOE a need for additional boreholes in the geotechnical specification to improve safety; DOE added a requirement for these boreholes to the specification. In addition, the Board noted that sand filters provide better inherent resistance to severe accidents than do high efficiency particulate air (HEPA) filters. In response, DOE committed to conduct a comprehensive study to compare the safety and cost benefits of the sand filter option with the HEPA filtration option.</p>	
<p>The Board prepared and issued DNFSB/TECH-27, <i>Fire Protection at Defense Nuclear Facilities</i>, setting forth principles and good practices for enhancing the reliability of DOE's complex-wide fire protection program.</p>	
<p>The Board's staff review of DOE's Y2K Program identified issues related to the evaluation of the safety related systems for year 2000 compliance. Programmatic issues at Los Alamos and Lawrence Livermore National Laboratories remained until the Fall of 1999 and required subsequent staff followup in late 1999. Following the improvement in DOE's Y2K program, there were no significant failures of safety-related systems at the calendar year turnover.</p>	
<p>In response to numerous letters from the Board associated with Integrated Safety Management, DOE upgraded its Lessons Learned process, including issuing new guidance documents and development of a centralized web-based Lesson Learned database. DOE also issued a set of ISM performance indicators to provide senior DOE managers with measures of the effectiveness of ISM at their sites.</p>	
<p>In response to Board Recommendation 98-1, <i>Resolution of DOE Internal Oversight Findings</i>, DOE implemented a formal process for dealing with safety issues identified by DOE's internal independent oversight organization. This resulted in a clearly defined, systematic, and comprehensive process for addressing and resolving these safety issues.</p>	
<p>The Board's staff continued to critique all ISM verifications at defense nuclear facilities. These verification reviews are the processes DOE uses to evaluate the status of ISM implementation and are key to the DOE Field Managers' determinations that their sites have implemented ISM. Additional criteria for determining ISM implementation were issued by the Deputy Secretary in October 1999. The Board worked closely with DOE in defining these criteria and in evaluating DOE's efforts to implement ISM at all sites.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-C:	<p><u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u> The Board and its staff will verify the effective development and implementation of DOE's Integrated Safety Management (ISM) program.</p>
Examples of FY 2001 Accomplishments	
<p>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, <i>Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports</i>, 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.</p>	
<p>Quality Assurance. Board interactions and correspondence with DOE, including three public meetings and the issuance of Board report DNFSB/TECH-31, <i>Engineering Quality Into Safety Systems</i>, 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.</p>	
<p>Software Quality Assurance. In January 2000, the Board's DNFSB/TECH-25, <i>Quality Assurance for Safety-Related Software at Department of Energy Defense Nuclear Facilities</i>, 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.</p>	
<p>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.</p>	
<p>Activity-level Integrated Safety Management. At the Hanford Site, activity level reviews of implementation of Integrated Safety Management associated with spent fuel handling operations in the K-Basins resulted in improved worker safety for fuel handling. At LLNL, reviews of maintenance and deactivation and decommissioning work conducted in Building 332 disclosed that manuals and codes of practice required significant improvement. At RFETS, SRS, and LANL, reviews indicated that site-wide processes were not adequate to ensure that radiation doses to the workers from exposures to plutonium were as low as reasonably achievable. At year-end, DOE and its contractors were taking steps to resolve these issues.</p>	
<p>Recommendation 2000-2. Board Recommendation 2000-2, <i>Configuration Management, Vital Safety Systems</i>, 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 initial reviews of priority facilities and conducted detailed pilot reviews of confinement ventilation systems at two facilities.</p>	
<p>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</p>	

Examples of FY 2001 Accomplishments (Continued)

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.

GOAL 1 — Complex-Wide Health and Safety Issues

<p>Objective 1–C:</p>	<p><u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u> The Board and its staff will verify the effective and expeditious development and implementation of DOE’s Integrated Safety Management (ISM) program.</p>
<p>FY 2002 Performance Goals</p>	
<p>The Board and its staff will conduct at least five reviews of DOE’s efforts to implement ISM throughout all facility life cycle phases, as well as efforts to make ISM more effective. Candidates for review include:</p> <ul style="list-style-type: none"> • Design of the Highly Enriched Uranium Storage Facility at the Y-12 National Security Complex. • Tritium Extraction Facility at the Savannah River Site. Assess the implementation of quality assurance requirements during facility construction and the procurement of safety significant facility equipment. • Design of the proposed Savannah River Site Pit Disassembly and Conversion Facility (PDCF) as well as potential modifications to existing facilities to replace portions of PDCF and the suspended Plutonium Immobilization Plant. • Other DOE design/construction activities. Reviews will be based on relative hazards, and on DOE’s schedule and progress on candidate facilities (e.g., Highly Enriched Uranium Material Facility and River Protection Projects at the Hanford Site). • The quality and effectiveness of at least one ISM review by the DOE Office of Oversight, and the implementation of line oversight of ISM per DOE P 450.5 at one EM site and one NNSA site. • Activity-level ISM implementation at sites with performance indicators judged to have higher than expected rates of occurrences related to worker protection. • The quality and effectiveness of at least one assessment of the configuration management of vital safety systems for an EM site and an NNSA site. 	
<p>As a result of these reviews, DOE will provide an adequate approach and schedule for resolution of identified issues that supports safe start-up and operation of new or modified defense nuclear facilities.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1–C:	<p><u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u> The Board and its staff will verify the effective and expeditious development and implementation of DOE's Integrated Safety Management (ISM) Program.</p>
FY 2003 Performance Goals	
<p>The Board and its staff will continue its reviews of DOE's implementation of ISM in design and construction, operation, and post-operation activities, as well as ongoing efforts to make ISM more effective. At least five reviews will be completed. Candidates for review include:</p> <ul style="list-style-type: none"> • Assess the adequacy of DOE's review of Title I/II design, resolution of significant design safety issues, the implementation of quality assurance requirements during facility construction, and the procurement of safety significant facility equipment. Candidate facilities for these activities include the Tritium Extraction Facility and the Pit Disassembly and Conversion Facility at the Savannah River Site, and the High Level Waste Treatment Plant at the Hanford Site. • Activity-level ISM implementation at sites with performance indicators judged to have higher than expected rates of abnormal occurrences related to worker protection. • The quality and effectiveness of at least one ISM review by the DOE Office of Oversight, and the implementation of line oversight of ISM per DOE P 450.5 at one EM site and one NNSA site. • Assess the adequacy and comprehensiveness of root cause determinations of operating events at DOE facilities. Emphasis will be placed on evaluating the prioritization and implementation of the corrective actions with respect to the relative risk significance of the findings which were identified. • Evaluate the reliability and availability of important safety systems with respect to equipment aging concerns. The evaluation will occur through several site reviews to assess site-specific issues associated with equipment availability and reliability from an aging perspective. • Assess the adequacy of the updates to the analysis of the natural phenomenon hazards (e.g., earthquakes, tornados, floods) mandated by DOE Order 420.1, <i>Facility Safety</i>, and associated guides and standards at the Y-12 National Security Complex. <p>As a result of these reviews, DOE will provide an adequate approach and schedule for resolution of identified issues that supports safe start-up and operation of new or modified defense nuclear facilities.</p>	

**STRATEGIC GOAL 2: SAFE STEWARDSHIP OF NUCLEAR WEAPONS
STOCKPILE AND COMPONENTS**

Continued safe execution of nuclear weapons stockpile support and defense nuclear research activities at DOE's defense nuclear facilities.

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

Strategic Objective 2–A: Safe Conduct of Stockpile Management. The Board and its staff will verify the safety of DOE's defense nuclear facilities and activities relating to the maintenance, storage, and dismantlement of the nuclear weapons stockpile. (See pages D-21 through D-25)

Strategic Goal 2–B: Safe Conduct of Stockpile Stewardship. The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapons stockpile in the absence of underground nuclear testing. (See pages D-26 through D-30)

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components.

Objective 2-A:	<u>Safe Conduct of Stockpile Management.</u> 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.
Examples of FY 1999 Accomplishments	
<p>DOE Standard on Hazards Analysis Reports. In early 1999, in response to a Board Recommendation, DOE developed and published a standard on conducting and documenting hazards analyses for nuclear explosive operations. This important directive sets DOE's fundamental expectations and provides guidance on how to establish and document the safety basis that ensures hazardous activities involving nuclear explosives can be completed safely.</p>	
<p>Lightning Protection at Pantex. The Board and its staff continued efforts during the last year to help DOE address the potential hazards from lightning to nuclear explosive operations at Pantex. This year, the DOE lightning protection project team (which was established in response to a Board reporting requirement) completed a comprehensive investigation and report detailing the threat of lightning to nuclear explosives, analyzing potential controls and mitigators, and summarizing the actions DOE considers necessary to protect nuclear explosive operations at Pantex from lightning threats. During this same time, DOE has identified and installed many additional lightning protective measures at the plant.</p>	
<p>Chemical Safety. Based on evaluations from its staff, the Board concluded that efforts to improve chemical safety at the Oak Ridge Y-12 Plant were not keeping pace with other defense nuclear sites or the Secretary of Energy's published expectations. After the Board communicated its concern, DOE stepped up efforts to complete a chemical management program at Oak Ridge Y-12, including a renewed commitment to characterize chemical inventories for emergency planning purposes and to dispose of excess chemicals.</p>	
<p>Safety Controls for Specific Nuclear Explosive Operations. The Board and its staff conducted numerous assessments of the safety of specific nuclear explosive activities at the Pantex Plant in the last year. These reviews, which included the W56 dismantlement, the W87 Life Extension Program, and the W62 surveillance program, identified safety-related issues such as the adequacy of safety analyses and controls, the flowdown of controls into operating-level procedures, and the readiness of activities to operate safely. As a result of the Board's involvement, DOE has taken positive action to improve the safety of all of these operations.</p>	
<p>Integrated Safety Management at Pantex. In early FY 1999, the Board issued Recommendation 98-2, <i>Integrated Safety Management at the Pantex Plant</i>, urging DOE to take fundamental actions to improve the safety of all weapons-related work at the Pantex Plant. Principle among the Board's specific recommendations was that DOE simplify and expedite its process for re-engineering processes at Pantex such that the attendant safety improvements could be put in place sooner. DOE accepted Recommendation 98-2 and made specific commitments to improve safety management at Pantex including accelerating efforts to establish weapon-specific safety basis for all on-going activities at Pantex.</p>	
<p>Enriched Uranium Restart at Y-12. The Board and its staff evaluated DOE efforts to resume enriched uranium operations at the Oak Ridge Y-12 Plant. In the last year, the Board identified to DOE several safety issues with the Phase A2 resumption project including design problems, safety analysis problems, and problems with implementation of safety controls. The Board and DOE worked cooperatively to resolve these issues such that Phase A2 operations could resume safely to support high priority national defense related missions.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

Objective 2–A:	<p>Safe Conduct of Stockpile Management. 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.</p>
Examples of FY 2000 Accomplishments	
<p>Pit Storage and Repackaging. Currently, the vast majority of plutonium pits at the Pantex Plant are in inadequate storage configurations. In response to the Board's Recommendation 99-1, <i>Safe Storage of Fissionable Material called "Pits,"</i> DOE has started a major effort to repackage all pits into improved storage containers and execute a surveillance plan to ensure that pits in storage remain in a safe environment.</p>	
<p>Y-12 Plant Safety Basis. As a result of staff reviews and several letters from the Board, personnel at the Y-12 Plant have revised the implementation plan for upgrades to the safety bases for their nuclear facilities. This upgrade program will lead to better identification of hazards and necessary controls for prevention and mitigation of potential accidents. This effort will also lead to implementation of the intent of an Integrated Safety Management program at the related facilities in a more effective manner.</p>	
<p>W62 Disassembly & Inspection Restart. As a result of the Board's and its staff's focused involvement in the reauthorization of Disassembly and Inspection (D&I) operations for the W62 nuclear warhead, DOE improved safety of the operation by upgrading the tooling and procedures used for the job. This effort, which was prompted by the Board's Recommendation 98-2, <i>Integrated Safety Management at the Pantex Plant</i>, also resulted in a substantial improvement in the technical rigor and thoroughness of the Nuclear Explosive Safety Study Revalidation process. In addition, the experience that DOE and its contractors gained during this effort resulted in an improved process for hazards analysis at Pantex for other nuclear explosive operations, and the execution of that process improved noticeably as a result of the progress made during the W62 D&I restart activities.</p>	
<p>Pantex Fire Protection. The Board and its staff highlighted to DOE senior management that the fire detection system at Pantex was failing because the commercial vendor had stopped producing spare parts. The review also identified that the fire suppression capability of the cells in one Building lagged behind that in other nuclear explosive operating facilities because they did not have ultra-violet detectors to initiate suppression. As a result of the Board's actions, a major part of the supplemental appropriation from DOE to Pantex will be used to install a UV detection system to activate the deluge system in the cells, greatly improving the fire safety of explosive operations in the area. Additionally, DOE has started plans (in response to Recommendation 98-2) to accelerate replacement of the fire detection system with a non-proprietary system supported by many different commercial vendors.</p>	
<p>Canned Subassemblies. Comparing safety analyses from the Pantex Plant and Y-12 Plant, the Board's staff noted that the analyses at Pantex did not consider the potential damage resulting from exposure of canned subassemblies (CSAs – the fusion portion of a nuclear weapon) to fires. Further research by the staff on the properties of the materials making up some CSAs indicated a significant hazard at Pantex that was not considered by the site or the Design Agency. Working with safety basis and other engineering personnel from all three sites, the staff assisted in the development of a predictive model of behavior for these components. Controls were subsequently enhanced to ensure that they were adequate to protect the CSAs.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

<p>Objective 2-A:</p>	<p>Safe Conduct of Stockpile Management. 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.</p>
<p>Examples of FY 2001 Accomplishments</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>Recommendation 99-1. In response to Board Recommendation 99-1, <i>Safe Storage of Fissionable Material called "Pits."</i> 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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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, <i>Integrated Safety Management at the Pantex Plant</i>. 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.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

<p>Objective 2–A:</p>	<p>Safe Conduct of Stockpile Management. 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.</p>
<p>FY 2002 Performance Goals</p>	
<p>The Board and its staff will conduct at least thirteen 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, and SRS tritium facilities and possibly stockpile management activities at Los Alamos National Laboratory.</p> <p>Candidate areas for Board and staff reviews include:</p> <ul style="list-style-type: none"> • Site-wide and facility-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., safety analysis reports). • Nuclear explosive operations (e.g., fire protection, the Separation Test Facility, and Pantex Bays and Cells). • Start-up of highly enriched uranium processing activities at the Y-12 National Security Complex (e.g., the hydrogen fluorination system and primary extraction). • Cross-cutting functional areas at the Pantex Plant, Y-12 National Security Complex, or SRS tritium facilities (e.g., nuclear criticality safety, fire protection, and nuclear explosive safety). • Special studies of unique or significant hazards at a DOE weapons facilities (e.g., process technology alternatives). <p>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 2002.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

<p>Objective 2–A:</p>	<p>Safe Conduct of Stockpile Management. 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.</p>
<p>FY 2003 Performance Goals</p>	
<p>The Board and its staff will conduct at least thirteen 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, and SRS tritium facilities and possibly stockpile management activities at Los Alamos National Laboratory.</p> <p>Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none"> • Site-wide and facility-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., safety analysis reports developed in response to 10 CFR 830). • Weapon-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., the W62 and the W78). • Start-up of highly enriched uranium processing activities at the Y-12 National Security Complex (e.g., secondary extraction). • Nuclear Explosive operations at Pantex (e.g., the W62, special purpose facilities, and on-site transportation). • Cross-cutting functional areas at the Pantex Plant, Y-12 National Security Complex, or SRS tritium facilities (nuclear criticality safety, fire protection, nuclear explosive safety). • Special studies of unique or significant hazards at a DOE weapons facilities (e.g., process technology alternatives). <p>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 2003.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

Objective 2–B:	<p><u>Safe Conduct of Stockpile Stewardship.</u> The Board and its staff will verify the safety of DOE’s defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.</p>
<p align="center">Examples of FY 1999 Accomplishments</p>	
<p>B332 Restart. After a Board letter in December 1997 identifying weaknesses in work planning, authorization and control in Building 332, Plutonium Facility, the Board interacted with Lawrence Livermore National Laboratory and the Department of Energy throughout Building 332’s Resumption of Operations in 1998 and 1999 to encourage and assist with the improvements. As a result, Building 332 implemented a process to plan, authorize and control work with special nuclear material safety. With the Board’s encouragement the process has been applied to the other facilities in the Superblock, i.e., Tritium Facility and Hardened Engineering Test Building. The Laboratory is revising site implementing guidance on planning, authorizing and control work to address a laboratory-wide systemic problem.</p> <p>Integrated Safety Management at LLNL. As a result of the Board’s effort to improve safety management at DOE defense nuclear facilities (Recommendation 95-2), LLNL developed a set of Work Smart Standards (a set of requirements and standards for hazards specifically applicable to LLNL), is making significant progress with developing a description of its integrated safety management system, and is developing site-wide standards/guidance to implement an integrated safety management system. Through direct Board interaction, Board letters, and Board staff visits and reviews, the Board has provided assistance with developing the Work Smart Standards and to the Laboratory’s efforts to develop policy and guidance to implement integrated safety management.</p> <p>Y2K. Based on staff reviews at Lawrence Livermore National Laboratory and other sites, the Board determined the DOE had provided inadequate direction to the operators of its defense nuclear facilities with regard to evaluating safety-related systems for year 2000 compliance. The Board communicated its concern to DOE in a letter requesting that DOE report on the status of safety-related equipment evaluations at all defense nuclear facilities. In April 1999, DOE issued detailed guidance on the evaluation of safety-related systems, requiring those systems be treated in a manner similar to mission-essential systems.</p> <p>Los Alamos National Laboratory Pajarito Laboratory. The Board and its staff identified deficiencies with the safety basis for activities conducted at the Pajarito Laboratory (also known as TA-18). The Board assisted DOE and the lab in defining a path to improve the safety basis including urging that DOE focus on Basis for Interim Operations to upgrade the safety controls at Pajarito Laboratory as soon as possible.</p> <p>Damaged Nuclear Weapons. The Board has recently focused attention on the issue that DOE’s capability to safely perform the work necessary to dispose of damaged nuclear devices (DNDs) at defense nuclear facilities is rapidly disappearing. In the past, maintenance of the facilities and personnel necessary to support this mission depended on nuclear test operations. However, the personnel and facility infrastructure that were required to support testing operations are rapidly disappearing. Planning DND operations so that they can be executed safely represents challenges that DOE is not addressing. DOE has agreed with the Board’s conclusions and is starting to increase its efforts to address this issue.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

<p>Objective 2-B:</p>	<p><u>Safe Conduct of Stockpile Stewardship.</u> The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.</p>
<p>Examples of FY 2000 Accomplishments</p>	
<p>LLNL Electrical and I&C. Based on reviews by the Board's staff of LLNL's electrical, instrumentation, and control systems, the Board concluded that the safety-class emergency power system at LLNL's plutonium facility (Building 332) was neither designed nor maintained to safety-class standards. The staff report also noted potential areas for improvement, particularly LLNL's Work Smart Standards for safety-related instrumentation and control systems and lightning protection for Building 332. In response, LLNL took prompt actions to address the Board's issues such as correcting improper seismic mounts for safety-critical electrical components and switchgear.</p>	
<p>LANL Authorization Basis (AB) Documents. The Board noted significant deficiencies in the quality of some AB documents at LANL and urged DOE and the laboratory to take decisive corrective actions. As a result of highlighting these issues, LANL, under strong guidance from LAAO, performed a thorough self-assessment of the quality of AB documentation. LANL found that the documentation for most of the facilities reviewed had significant deficiencies. LANL, under guidance from LAAO, agreed contractually to upgrade the quality of the documentation involved. LANL has also reorganized to improve its ability to assure the quality of ABs.</p>	
<p>LANL Response to Cerro Grande Fire and Potential for Flooding. After firefighters began to control the Cerro Grande fire, the Board conducted on-site reviews of the status of defense nuclear facilities and LANL's facility recovery plans. The defense nuclear facilities incurred little or no significant damage, and facility recovery plans were found to be thorough. The Board also reviewed the potential for flooding as a result of the loss of the ability of soil to absorb water. LANL responded swiftly to the threat of flooding with flood control and mitigation measures. The Board, however, identified important areas where DOE needed to be more thoroughly engaged in reviewing the adequacy and appropriateness of measures being taken immediately and in the future to address flooding concerns.</p>	
<p>LLNL Safety Basis Improvement. Extensive Board and staff reviews of LLNL's authorization basis for defense nuclear facilities have focused the Oakland Operations Office's attention towards nuclear safety and enhanced technical competence and the degree of involvement in the safety basis at LLNL. In response to the Board's reviews, there has been a substantial and continuing improvement of the LLNL Safety Basis program, including improvements in technical competence, training, and quality of safety basis documents.</p>	
<p>Readiness to Dispose of a Damaged Nuclear Weapon at the Nevada Test Site. The Board highlighted to DOE that there are 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, DOE has developed a project to upgrade its capabilities to conduct these activities safely. DOE has conducted a number of exercises that clearly identified issues needing to be addressed. The drills and exercises have already improved DOE's proficiency in this important mission area. With the Board's continued oversight DOE is now prioritizing its infrastructure upgrade needs.</p>	
<p>LANL Classified Experiment. Board interactions with LANL have led to the formation of a group of experts to thoroughly review a classified experiment with potentially significant safety consequences and are significantly improving the quality of safety controls. The expert panel has been conscientiously evaluating the complicated activity and has identified numerous improvements that LANL has implemented (or is working on) that substantially improve the safety of this experiment and the design and safety basis for similar experiments potentially conducted in the future.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

Objective 2-B:	Safe Conduct of Stockpile Stewardship. The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.
Examples of FY 2001 Accomplishments	
<p>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.</p>	
<p>Lightning Detection and Warning at LANL. The Board's 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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>Fire Protection at LLNL. The Board identified that a building fire alarm system is inadequately designed 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.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

<p>Objective 2–B:</p>	<p><u>Safe Conduct of Stockpile Stewardship.</u> The Board and its staff will verify the safety of DOE’s defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.</p>
<p>FY 2002 Performance Goals</p>	
<p>The Board and its staff will conduct at least seven assessments of DOE’s efforts to develop and implement safety management systems for stockpile stewardship activities. The Board will also cover DOE’s efforts to address safety issues of aging-related changes in nuclear weapons components, including research and modeling, for weapon systems and components in the enduring stockpile. These reviews will focus on activities at LLNL, LANL, NTS, and SNL. Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none"> • The safety basis analysis for defense nuclear activities or facilities; e.g., the Weapons Engineering Tritium Facility and the Plutonium Facility at LANL. • Work-planning process (i.e., activity-specific hazard analysis, controls identification, and implementation of safety controls). • DOE/contractor operational readiness reviews or other readiness determinations. • Preparation to dispose of damaged nuclear weapons and improvised devices at NTS. • Design and construction phases of the life-cycle of defense nuclear facilities, e.g., replacement for the Los Alamos Critical Experiments Facility and the Sandia Underground Reactor Facility. • Aging-related changes in nuclear weapons components for weapon systems in the enduring stockpile. • Safety controls selected for hazardous weapons complex activities. • Cross-cutting functional areas at LANL, LLNL, NTS, and SNL. <p>While performing the above reviews, the Board and its staff will assess the effectiveness of ISM implementation for proposed and on-going operations.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

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**STRATEGIC GOAL 3: SAFE DISPOSITION OF HAZARDOUS
REMNANTS OF WEAPONS PRODUCTION**

Safe and effective characterization, stabilization, and storage of hazardous remnants of nuclear weapons production and decommissioning of legacy facilities in a manner that protects the worker, the public, and the environment.

The objectives and annual performance goals in support of the Board's third goal address the Board's efforts to confirm the safe disposition of hazardous nuclear weapons legacy materials and facilities. Achieving this goal requires a multi-year, multi-focus, multi-site effort during each annual performance period. The two strategic objectives that support the general goal address DOE's efforts to reduce the risks of legacy materials by appropriate processing and disposition, as well as efforts to decommission production facilities and sites no longer essential to the national security mission.

Strategic Objective 3–A: Material Stabilization. The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal, as needed. (See pages D-32 through D-36.)

Strategic Objective 3–B: Facility Decommissioning. The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public. (See pages D-37 through D-41.)

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

<p>Objective 3-A:</p>	<p>Material Stabilization. The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal, as needed.</p>
<p>Examples of FY 1999 Accomplishments</p>	
<p>Improved Remediation Schedules for Legacy Materials: In December 1998, after numerous formal and direct interactions with the Board and its staff, DOE issued an up-to-date plan and schedule for addressing the numerous health and safety risks posed by the highest priority legacy materials stored throughout the DOE nuclear weapons complex, originally identified by the Board in Recommendation 94-1. However, the Board identified several deficiencies in the new plan, and soon thereafter discovered that site-level planning did not support several significant commitments. The Board engaged DOE on these issues, and will see that they are resolved expeditiously.</p>	
<p>Operational Problems at Savannah River Site: In the Spring of 1999, the Board's continuing review of operational data for DOE defense nuclear facilities revealed a negative trend in control of work and operations at the Savannah River Site. The Board issued a letter to DOE in May 1999 identifying this problem to DOE, stating that a broader look at the underlying causes and a systematic understanding of those causes would be required to correct weaknesses in performance. In response, DOE began corrective actions to reverse this trend and ensure a sustained, highly satisfactory level of performance.</p>	
<p>Completion of Recommendation 94-3 at Rocky Flats: The Board issued Recommendation 94-3, <i>Rocky Flats Plutonium Storage</i>, to ensure that the large quantity of plutonium at the Rocky Flats Environmental Technology Site would be safely stored. The Board recommended that DOE take a systematic approach to evaluating the suitability of one building for the proposed new mission of storing the site's entire plutonium inventory, and prepare a program plan for building upgrades and improvements consistent with the building's mission. As a result of the Board's recommendation, upgrades to the building's structure, systems, and components, as well as the safety basis, were completed during Fiscal Year 1999. The Board closed this recommendation and now considers the building adequate for its current storage mission.</p>	
<p>Characterization and Safety of Hanford High-Level Waste Tanks: The Board and its staff have continued to press DOE to resolve the health and safety issues presented by the 177 high-level waste tanks at Hanford. In 1999, the Board worked closely with DOE to develop a strategy for resolving the remaining safety-related uncertainties in the characterization of the wastes, and to ensure that DOE developed a sound strategy for mitigating flammable gas retention problems in Tank 241-SY-101. Because of these efforts, Board Recommendation 93-5, dealing with Hanford high-level waste characterization, is expected to be closed shortly, and the Board expects that DOE will be able to resolve the Tank 241-SY-101 problem in FY 2000.</p>	

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

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<p>Examples of FY 2000 Accomplishments</p>	
<p>Improved Remediation Schedules for Legacy Materials: On January 4, 2000, the Board issued Recommendation 2000-1 to ensure that the stabilization of legacy materials continues in a manner that reflects the risks posed by the materials. Additionally, the Board recommended that funding shortfalls preventing timely stabilization of materials be identified and reported as required by law. On June 8, 2000, DOE submitted a revised implementation plan intended to satisfy both Recommendation 94-1 and 2000-1. According to the plan the vast majority of remaining material will be stabilized within the next several years. Outstanding issues relating to material stabilization were communicated to DOE in a letter dated July 14, 2000.</p> <p>In accordance with the Implementation Plan for Board Recommendation 94-1 and the US District Court of Idaho Court Order, all spent nuclear fuel was removed from the unlined basins at the Idaho National Engineering and Environmental Laboratory CPP-603 Fuel Receiving and Storage Building to a newer fuel storage facility (CPP-666) by April 28, 2000. Transfer of the fuel reduces the risk of leakage of radioactive materials from deteriorating spent fuel in unlined basins and is the first step towards drying and encapsulation of the spent fuel in dry storage facilities for the longer-term.</p> <p>Standards for Safe Storage of Fissile Materials: In July 2000, DOE issued a standard for stabilization and packaging of uranium-233 metals and oxides for safe long-term storage. This standard was developed in response to Board Recommendation 97-1, with the Board working closely with DOE during its development to ensure that it contained appropriate requirements for safely storing this highly radioactive isotope. The Board also continued to assist DOE in refining a similar standard for safe packaging and storage of plutonium, which had been finalized and issued in response to Board Recommendation 94-1. In early 2000, after extensive review and discussions with DOE, the Board agreed to modifications to the plutonium standard that would make it easier to implement without compromising safety.</p> <p>Engineered Safety Controls: In several reviews of new operations at the Savannah River Site, the Board identified inadequacies in the use of engineered controls to prevent potential accidents. As a result, improved controls were implemented for high-level waste retrieval activities. The Board is pursuing similar improvements in the design of the equipment for pretreatment and vitrification of highly radioactive americium/curium solutions at Savannah River. The Board is continuing to press DOE to address the root cause of these problems, and to reaffirm the importance of avoiding an undue reliance on administrative controls and non-safety-grade equipment.</p> <p>Implementation of Radioactive Waste Management Order: In response to Board Recommendation 94-2, DOE has revised and reissued its radioactive waste management order, Order 435.1, to provide more comprehensive and effective requirements. The Board discovered this year that DOE had informed the operating contractor at Rocky Flats that several key provisions of the order did not apply to Rocky Flats on the grounds that it was not considered an operating facility. The Board acted immediately to correct this problem, ultimately issuing formal correspondence that led DOE to reverse this inappropriate interpretation before it spread to other sites.</p> <p>Safe Storage of High-Level Waste: In June 2000, the Board's staff completed a review of high-level waste tank systems at the Hanford Site. Several significant issues were identified related to preserving the integrity of the storage tanks, notably the need to promptly correct the chemistry in tanks that had become depleted of corrosion inhibitors, the need to ensure the operability of ventilation systems required to prevent moisture from forming between the inner and outer tank walls, and the need for a defined program for ensuring the integrity of the secondary shell of the tanks.</p>	

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

Objective 3–A:	<p>Material Stabilization. The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal, as needed.</p>
Examples of FY 2001 Accomplishments	
<p>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, <i>High-Level Waste Management at the Savannah River Site</i>. 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.</p>	
<p>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.</p>	
<p>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 time. 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 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 towards successful resolution of the Board's remaining issues.</p>	
<p>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, fulfilling another commitment responding to Recommendations 94-1 and 2000-1.</p>	
<p>Uranium-233 Stabilization. In response to Board Recommendation 97-1, <i>Uranium-233 Safe Storage</i>, 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 canister inspections began in October 2001.</p>	
<p>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.</p>	

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FY 2002 Performance Goals	
<p>The Board and its staff will conduct at least nine 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, the safety of ongoing operations, and the suitability of long-term storage and disposal facilities. Representative areas for review include:</p> <ul style="list-style-type: none"> • Stabilization and packaging of plutonium metal and oxide at Hanford and LANL (Recommendation 94-1/2000-1). • Design of facilities for stabilization, packaging, and storage of plutonium metal and oxide at Savannah River (Recommendation 94-1/2000-1). • Stabilization and disposal of plutonium-bearing solutions and residues at Savannah River, Hanford, and LANL (Recommendation 94-1/2000-1). • Preparations for pretreatment and disposition of americium/curium solutions at Savannah River (Recommendation 94-1/2000-1). • Characterization, stabilization, and packaging of uranium-233 (U-233) materials at Oak Ridge (Recommendation 97-1), as well as planning for processing of U-233 for potential medical applications. • Stabilization and disposition of highly-enriched uranium solutions at Savannah River (Recommendation 94-1/2000-1). • Design of the treatment process for high-level waste liquids and salts at Savannah River, including pilot plant design and construction (Recommendation 96-1) and system improvements to ensure safe management of the Savannah River Site high-level waste in the interim (Recommendation 2001-1). • Design of facilities for treatment of high-level waste, and testing and operation of high-level waste retrieval and transfer systems at Hanford. • Design and construction of the Melton Valley transuranic/alpha waste treatment facility at Oak Ridge. • Preparations for remote-handled transuranic waste disposal operations at WIPP and safety of contact-handled transuranic waste disposal operations as full throughput operational levels are achieved and sustained. • Safety of spent nuclear fuel stabilization operations at Hanford and design and construction for transfer, storage, and stabilization of sludge and K-East Basin fuel (Recommendation 94-1/2000-1). • Complex-wide legacy nuclear material issues, including evaluation of materials not addressed by Recommendations 94-1 and 2000-1 and utilization of stabilization capabilities. 	

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GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

Objective 3-B:	Facility Decommissioning. The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.
Examples of FY 1999 Accomplishments	
<p>Upgraded Safety Controls for Decommissioning at Rocky Flats. Decommissioning activities are being conducted in several buildings at the Rocky Flats Environmental Technology Site. The Board identified that safety controls for protection of workers did not provide the desired level of protection because of an inappropriate reliance on personal protective equipment (e.g., respirators) rather than engineered controls to eliminate or mitigate hazards. Furthermore, when engineered controls were used (e.g., air movers), they were not adequately analyzed to ensure that they produced the desired result. In response to these concerns, a multi-disciplinary team was chartered at RFETS to develop more rigorous engineered controls and analyze performance of the controls. Enhanced worker protection controls are now being applied to demolition of contaminated equipment at the site. RFETS is also investigating the use of remote equipment for size reduction of contaminated equipment.</p>	
<p>Activity Level ISM of Hanford Decommissioning Work. The Board's staff reviewed planning and implementation of decommissioning work being done by the Hanford Environmental Restoration Contractor. The staff found that the work control procedures and practices needed improvement to meet the intent of Integrated Safety Management. The approach to hazard analysis did 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. Some areas of needed improvement have been communicated directly to DOE.</p>	
<p>Radiation Protection Measures for Metal Tritides during Decommissioning. During FY 1999, the Board's staff evaluated radiation protection program measures for decommissioning work in areas at the Miamisburg Environmental Management Project (MEMP) that are suspected of being contaminated with tritium compounds such as metal tritides. As a result of staff visits and subsequent information exchanges, the MEMP contractor prepared a corrective action plan to address deficiencies in the radiation protection program, and work is proceeding to resolve these issues before major decommissioning work begins in mid-September 1999. These technical issues also apply to other defense nuclear facilities, so the Board has requested that DOE articulate a technical position on this matter to ensure that appropriate measures are implemented across the defense nuclear facilities complex. As a result of this action, DOE-EM informed DOE Field Offices of the issue, drafted a technical position regarding control levels for airborne radioactivity, and has committed to developing an updated technical approach.</p>	

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Objective 3–B:	Facility Decommissioning. The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.
Examples of FY 2000 Accomplishments	
<p>Efforts to Improve Decommissioning Work at the Hanford 233-S Facility. The Board's staff has monitored the planning and accomplishment of decommissioning work at the Hanford 233-S Plutonium Concentration Facility. Board correspondence and staff comments to DOE and its contractor regarding this facility have focused on work planning and implementation deficiencies. Safety deficiencies involving the work site and Process Hood glove bags noted by the staff have been discussed with project personnel, and corrective actions were taken to resolve some concerns. The staff has noted that efforts are being made to improve work planning and implementation. For example, the contractor held a workshop to review the radiological work planning process and provide recommendations for improvement, and a contractor project manager requested that a team of contractor and DOE health physicists inspect glove bags used in Process Hood decommissioning work.</p>	
<p>Upgraded Work Controls for Decommissioning at Rocky Flats. The Board has followed dismantlement work activities for gloveboxes and other equipment in Building 771 (the former Plutonium Recovery Facility) at the Rocky Flats Environmental Technology Site (RFETS) and has issued correspondence noting problems with work planning and control. The staff reviewed the implementation of the RFETS Integrated Work Control Program (IWCP) and provided comments to RFETS personnel. The contractor revised the IWCP manual and has taken steps to improve the implementation of the program. This action has contributed to addressing the staff's observations of deficient implementation of the hazard analysis process for deactivation and decommissioning activities in facilities such as Building 771.</p>	
<p>Upgraded Safety Controls for Decommissioning Work at Rocky Flats. The Board's staff has followed RFETS' efforts to apply engineered controls for size reduction of gloveboxes and other equipment in response to comments provided by the Board. These controls will help remove or greatly reduce the radioactive airborne environment. The staff has continued to communicate the need to mitigate or eliminate hazards by the use of engineered controls, and RFETS personnel are actively pursuing a phased approach of design, testing, and implementation of engineered controls in support of their site closure work.</p>	
<p>New and Revised Procedures for Decommissioning Work at the Miamisburg Environmental Management Project. The Board's staff reviewed and provided comments regarding a draft technical basis document, new and revised implementing procedures, and plans for determining readiness for decommissioning work involving special tritiated compounds at the Miamisburg Environmental Management Project (MEMP). These comments contributed to improving the documents. Various work control documents have been reviewed, and staff comments have been provided to DOE-MEMP and the contractor. Staff-to-staff discussion is expected to help better identify and resolve deficiencies.</p>	

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

Objective 3-B:	Facility Decommissioning. The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.
Examples of FY 2001 Accomplishments	
<p>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 on-site 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 presented an accelerated option that completes deactivation in six years, and that efforts to stabilize pyrophoric material are proceeding toward an Operational Readiness Review in early FY 2002.</p>	
<p>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.</p>	
<p>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).</p>	
<p>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 10 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.</p>	
<p>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</p>	

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

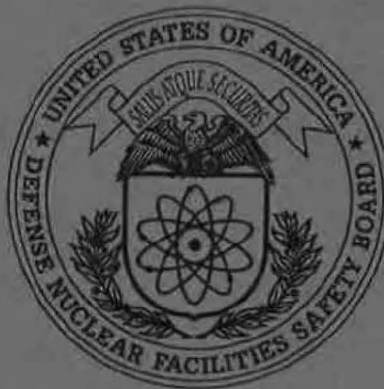
Objective 3-B:	<u>Facility Decommissioning.</u> The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.
FY 2002 Performance Goals	
<p>The Board and its staff will conduct at least four assessments of the adequacy of plans, standards, procedures, and execution for activities associated with decommissioning of DOE defense nuclear facilities. These assessments will be conducted using the principles of Integrated Safety Management to ensure that decommissioning efforts are performed safely. Additionally, the Board and its staff will continue efforts to confirm that high-risk facilities are decommissioned in a timely manner. These assessments are conducted in collaboration with State and other regulatory authorities, as needed, and on a schedule that supports DOE's operational plans. Representative areas for Board and staff review include:</p> <ul style="list-style-type: none"> • Building 371, 707, 771, or 776/777 at Rocky Flats. • Building 9206 at Y-12 National Security Complex. • Excess facility structural issues at Hanford and Savannah River. • Decommissioning at Los Alamos National Laboratory • CPP-603 spent fuel basin at INEEL. 	

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

Objective 3–B:	<u>Facility Decommissioning.</u> The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.
FY 2003 Performance Goals	
<p>The Board and its staff will conduct at least four assessments of the adequacy of plans, standards, procedures, and execution for activities associated with decommissioning of DOE defense nuclear facilities. These assessments will be conducted using the principles of Integrated Safety Management to ensure that decommissioning efforts are performed safely. Additionally, the Board and its staff will continue efforts to confirm that high-risk facilities are decommissioned in a timely manner. These assessments are conducted in collaboration with State and other regulatory authorities, as needed, and on a schedule that supports DOE’s operational plans. Representative areas for Board and staff review include:</p> <ul style="list-style-type: none"> • Plutonium Finishing Plant deactivation planning at Hanford. • Building 371, 707, or 776/777 at Rocky Flats. • Decommissioning activities at Mound and Fernald Environmental Management Projects. • Building 9206 at Y-12 National Security Complex. • Promulgation of lessons-learned and decommissioning techniques from sites where significant decommissioning activities have been accomplished. 	

FY 2004
BUDGET REQUEST
TO THE
CONGRESS

Defense Nuclear Facilities Safety Board



February 2003

GPRA Strategic Planning Requirements

The Government Performance and Results Act of 1993 (GPRA) requires each agency to prepare and submit a strategic plan establishing long-term programmatic, policy, and management goals. The Defense Nuclear Facilities Safety Board's Strategic Plan for FY 1999-2004 is available on the Internet at www.dnfsb.gov. In addition, agencies are also required to develop annual performance plans which indicate the progress toward achievement of the strategic plan's goals and objectives. The Board's annual performance plans for FY 2003 and FY 2004, as well as representative accomplishments for FY 1999 through 2002, are included as Appendix D of this budget request in accordance with the requirements of OMB Circular A-11.

For a comprehensive review of the Board's activities to improve the safety of the Department of Energy's defense nuclear facilities and identify remaining problems, please see the Board's Reports to Congress which can be reviewed at the above Web address.

**Defense Nuclear Facilities
Safety Board
FY 2004 Congressional Budget Request**

APPROPRIATION & EXPENSE SUMMARY

(Tabular dollars in thousands.)

OPERATING EXPENSES

	<u>ACTUAL FOR FY 2002</u>	<u>PROJECTED FOR FY 2003</u>	<u>BUDGET REQUEST FOR FY 2004</u>	<u>BUDGET REQUEST FOR FY 2004 WITH LEGISLATIVE PROPOSAL **</u>
New Budget Authority	18,486*	19,000	19,559	20,110
Obligations	19,770	19,780	20,576	21,127
Outlays	19,773	19,053	19,503	20,054

* \$18,500,000 appropriation; \$14,000 rescission.

** Includes \$551,000 to cover the estimated cost of the Administration's legislative proposal to increase agency costs for accruing employee CSRS pension costs and annuitant health benefits for all employees, while reducing reported costs from central mandatory accounts by an equal amount.

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).

**Defense Nuclear Facilities
Safety Board
FY 2004 Congressional Budget Request**

PERSONNEL SUMMARY

	<u>FY 2002 ACTUAL</u>	<u>FY 2003 FINANCIAL PLAN</u>	<u>FY 2004 BUDGET REQUEST</u>
Statutory Personnel Ceiling: (FTE's) ^{1/}	150	150	150
FTE Usage ^{2/}	95	98	102
 Board Members & Permanent Employees at End of Fiscal Year	 96	 102	 102

^{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 safety 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.

**Defense Nuclear Facilities
Safety Board
FY 2004 Congressional Budget Request**

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, \$19,559,000 to remain available until expended.

Note — A regular 2003 appropriation for this account had not been enacted at the time the budget was prepared; therefore, this account is operating under a continuing resolution (P.L. 107-229, as amended). The amounts included for 2003 in this budget reflect the Administration's 2003 policy proposals.

**Defense Nuclear Facilities
Safety Board
FY 2004 Congressional Budget Request**

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**Defense Nuclear Facilities
Safety Board
FY 2004 Congressional Budget Request**

1. EXECUTIVE SUMMARY

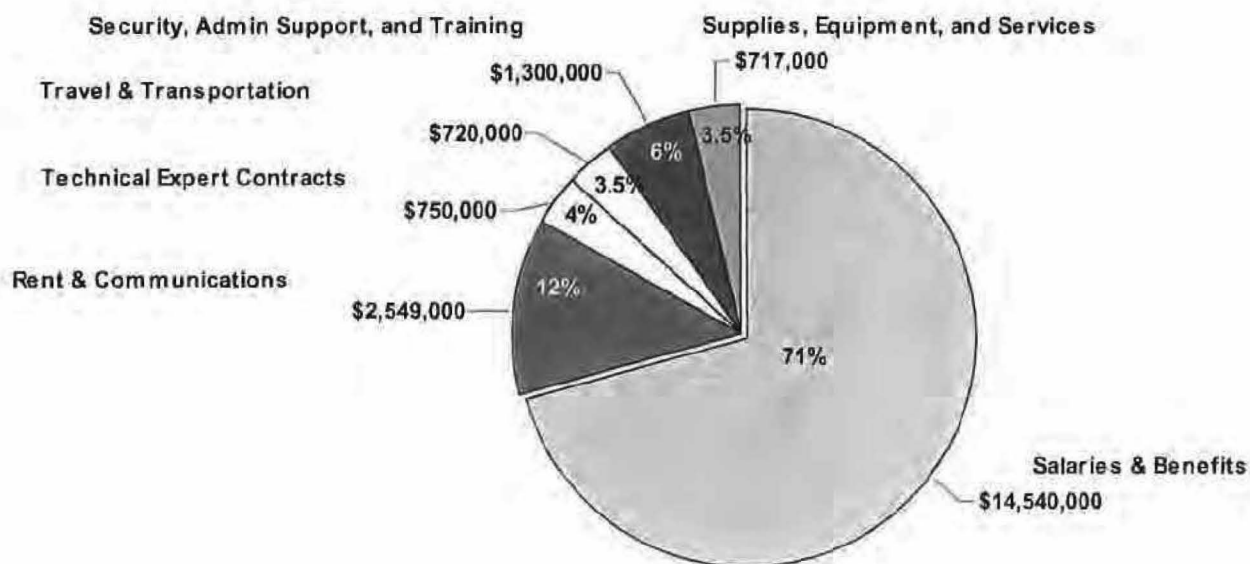
Appropriation Request for FY 2004

The Defense Nuclear Facilities Safety Board's (Board) FY 2004 Budget Request is for \$19.559 million in new budget authority and 102 full-time equivalent (FTE) staff years. This amount does not include \$551,000 to fund the Administration's legislative proposal to increase agency costs for accruing employee CSRS pension costs and annuitant health benefits. This budget request does include \$559,000 to:

- Fund new physical and cyber security countermeasures required by the Federal Information Security Management Act (FISMA), and as a result of the reviews conducted in response to the September 11 terrorist attacks;
- Offset the compounding growth effects in non-discretionary expenses such as cost-of-living pay increases for Board employees; and
- Replace key technical staff lost due to attrition during FY 2002.

As depicted on the following chart, the Board's budget is used primarily to pay the salaries and benefits of its employees, and therefore limits the Board's ability to absorb non-discretionary pay increases from other sources.

FY 2004 Total Projected Obligations = \$20,576,000



Specifically, a \$457,000 increase in funding is requested to help the Board pay for the out-year impacts of the 4.6 and 3.1 percent cost-of-living pay increases effective in January 2002 and January 2003, respectively, as well as the projected pay increase of 2.4 percent effective in January 2004. Since the Board currently is operating with only 92 staff and three full-time Board Members (63 percent of its statutory employment ceiling), the recruitment and retention of scientific and technical staff with outstanding qualifications to replace recent staff losses due to retirement or resignation will continue to be critical to the successful accomplishment of the Board's mission. In addition to the expected confirmation of two new Board Members, the Board plans to hire five technical staff including two replacement site representatives for the Pantex and Oak Ridge sites, and three senior nuclear weapon engineers.

The appropriation request includes \$103,000 to cover the estimated cost of the Board's share of additional physical security countermeasures recommended by the GSA and the Federal Protective Service for the Indiana Plaza location, and to implement computer security upgrades based on the security assessment required by FISMA under OMB oversight. At present, the Indiana Plaza building does not have visitor or package screening capability at the lobby or parking garage entrances. FISMA required initiatives include improved hardware to counter attacks on the Board's computer network, and encrypted electronic hardware and software for workstation security.

An additional \$551,000 would be needed to cover the estimated cost of the Administration's legislative proposal to increase agency costs for accruing employee CSRS pension costs and annuitant benefits for all employees, while reducing reported costs from OPM central mandatory accounts by an equal amount. (See Appendix B for additional information on this legislative proposal.)

The technical complexity and safety risks associated with the life cycle of this Nation's nuclear weapons, including the overall health and safety of the public, dictate a continuing need for strong Federal leadership and budget support. Safety oversight programs conducted by the Board directly impact the health and safety of the public and need continued support due to the potential for significant loss of life, injury, or property damage if an accident should occur.

Background

The Board is an independent Federal agency established by Congress in 1988. Broadly speaking, the Board's mandate under the Atomic Energy Act is safety oversight of the defense nuclear weapons complex operated by the Department of Energy (DOE). The nuclear weapons program remains a complex and hazardous operation. DOE must maintain readiness of the nuclear arsenal, dismantle surplus weapons, dispose of excess radioactive materials, clean up surplus defense facilities, and construct new facilities for many purposes. All of these functions must be carried out in a manner that protects the public, the workers, and the environment. For a more detailed discussion of the Board's statutory mission, please see Appendix A.

Congress expects the Board to be an independent, expert agency capable of understanding the complexity of nuclear weapons facilities and operations. For that reason, the five full-time Board Members are required by statute to be experts in the field of nuclear safety. The Board has, in turn, assembled a small permanent staff with broad nuclear weapon and industry experience and

competence in all major aspects of nuclear safety: nuclear, mechanical, electrical, chemical, and structural engineering, as well as physics and metallurgy. Currently, 87 percent of the Board's technical and legal staff hold advanced degrees, of which 29 percent are at the Ph.D. level.

Safety Oversight Mission

DOE is committed to the design and construction of numerous projects during the next decade in support of the nuclear weapons stockpile and to resolve the remaining health and safety issues that are the historical legacy of past weapons production. For example, tritium extraction for stockpile use, conduct of nuclear experimentation, and preservation of the strategic pit inventory, will require new defense nuclear operations. DOE's National Nuclear Security Administration (NNSA) also is developing a strategy that will change the balance and location of some defense nuclear work throughout the complex. As this strategy is implemented, some sites that have seen lesser amounts of nuclear work in recent years (such as the Lawrence Livermore National Laboratory and the Nevada Test Site) will significantly increase program activity.

While focusing attention on existing defense nuclear facilities and operations, the Board is required by statute to review design efforts, construction activities, and the initial operation of new defense nuclear facilities, and to make timely recommendations on any needed public health and safety improvements to the Secretary of Energy. The technical capability of the Board is essential to ensuring that safety is addressed early in the design work planned during FY 2003 and FY 2004 for more than 24 ongoing projects. Safely implementing the transfer of hazardous defense nuclear activities between sites—with the associated need to assure competent personnel, rigorous authorization basis control, and effective operational safety management—also will continue to pose many challenges for DOE and its contractors, as well as associated oversight challenges for the Board.

Direct Service Delivery to Citizens

The Board continues to be sensitive to the need for citizen involvement. To that end, the Board has used open public meetings and hearings, as well as its Web Site (www.dnfsb.gov), to increase public awareness, communicate the Board's activities, and solicit citizen comments and issues.

The Board has also continued its practice of meeting with state and local officials, labor leaders, DOE's facility workers, citizen advisory boards, public interest groups, and area residents to exchange information and inform interested parties of the Board's work. Board Members have conducted public meetings and hearings in the vicinity of DOE's defense nuclear facilities, most recently in communities near the Hanford Site, the Savannah River Site, the Oak Ridge Reservation, and the Pantex Plant. To date, a total of 36 public meetings have been conducted at or near DOE sites and 46 in Washington, D.C. The records of these meetings are made available to the public.

In order to ensure compliance with Section 508 of the Rehabilitation Act, a redesign of the Board's Website was completed in FY 2002. The redesigned Website enhances accessibility for individuals with disabilities and offers convenient public access to the Board's oversight work. Concerned citizens can easily access downloadable public documents and Web casts of public meetings at their convenience.

The challenges in recruiting and retaining a high-quality, diverse workforce can be grouped into two categories: (1) competition from the private sector, and (2) fiscal constraints. Competition for top engineering professionals is intense. Even with the special hiring and pay authorities granted to this Board, private industry can easily out-bid and out-perk the Board for the top-caliber engineering talent that the Board needs to conduct its health and safety oversight operations. The Board has also found that the Federal downsizing campaigns of the 1990's, coupled with the perception that the Federal bureaucracy stifles creativity and fails to encourage and reward outstanding work, have created sizable obstacles to overcome in our recruiting campaigns. Recruitment and retention of recent college engineering graduates, especially women and minorities, is difficult in the current job market and will become even more challenging with the renewed interest in the commercial nuclear market.

With the enactment of the Board's full appropriation request of \$19 million for FY 2003, the Board intends to hire selected technical experts to address new, changing technical issues and to replace key technical staff who have left the Board. By the end of FY 2003, the Board expects to hire seven replacement employees to reach the Board's FTE allowance of 102 (68 percent of the Board's statutory ceiling) for FY 2004 (includes five full-time Board Members in total). Replacement hires include: senior nuclear weapons engineers and operations specialists for two site representative positions at Oak Ridge and Pantex, as well as Presidential appointments to two vacant Board Member positions.

The Board plans to continue its recruitment of engineering and technical students through its Professional Development Program (PDP) to address the expected loss of staff capabilities. The PDP is a three-year program that 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 to attract the next generation of scientific and technical talent to Federal service.

2. SAFETY OVERSIGHT STRATEGY

Maintaining an effective safety oversight program that fulfills the broad mandates of the Board's enabling legislation requires a constant reassessment of health and safety conditions throughout DOE's defense nuclear complex. The Board continues to focus its attention on the most hazardous DOE operations and complex-wide health and safety issues, consistent with the Board's safety oversight approach and its strategic plan. Specifically, the Board has prioritized the application of its resources to emphasize nuclear safety review activities at the following sites, plants, and facilities:

- *Pantex Plant (Texas)*—Stewardship and maintenance of the nuclear weapons stockpile including assembly, evaluation, maintenance, and dismantlement of nuclear explosives and the storage of special nuclear material, particularly plutonium pits.

- *Savannah River Site (South Carolina)*—Operation of existing tritium facilities and design and construction of new facilities for the extraction of tritium, storage of special nuclear material, and the stabilization of high-level waste and residual materials from the former production of the nation's nuclear weapons arsenal.
- *Nevada Test Site*—Stewardship of the nuclear weapons stockpile, including subcritical experiments, and the capability to deal with damaged nuclear weapons and improvised nuclear devices.
- *Oak Ridge Y-12 National Security Complex (Tennessee)*—Stewardship and maintenance of nuclear weapons components including highly enriched uranium processing; fabrication, assembly, and disassembly of nuclear weapon components and subassemblies; and storage of nuclear materials, including uranium from weapon components.
- *Los Alamos National Laboratory (New Mexico), Lawrence Livermore National Laboratory (California), and Sandia National Laboratories (New Mexico and California)*—Support for stockpile management and stewardship of the nation's nuclear weapons, including research and enhanced surveillance of aging weapons, and stabilization and storage of nuclear materials.
- *Hanford Site (Washington)*—Remediation of high-level radioactive waste, stabilization of corroding highly radioactive spent nuclear fuel currently stored in the K-East and K-West Basins, and stabilization of residual material from plutonium production.
- *Rocky Flats Environmental Technology Site (Colorado)*—Stabilization of residuals of plutonium production and deactivation of numerous highly contaminated buildings.

Sources of information used by the Board in formulating its assessments, evaluations, and recommendations to the Secretary of Energy are varied. They include testimony from public hearings and meetings, Congressional inquiries, reports from site representatives, staff issue papers, site visits, Implementation Plans for the Board's recommendations, responses to reporting requirements, and correspondence from workers and union representatives at the DOE sites. The Board's priorities change to reflect its assessment of the risks and potential effects on the health and safety of the public or workers, resulting in revised technical review assignments for the Board's staff.

On the basis of 13 years of operating experience, the Board has established the following guiding principles for maximizing the effective use of its resources:

- The primary responsibility for ensuring protection of the health and safety of the public and workers rests with DOE's line managers and extends in an unbroken chain from the Secretary of Energy to the workers on the floor.

In response to the Board's attention to this complex-wide safety issue, DOE has taken positive actions to ensure the operability of vital safety systems. Following an initial assessment of each of the vital safety systems in high priority defense nuclear facilities, DOE completed more in-depth assessments of specific systems and programs (e.g., drawing control and configuration management) which the initial assessment had targeted. These detailed assessments identified significant weaknesses in the operability of several systems that required in-depth evaluation and sometimes repairs to ensure the continued operability of the system. Common deficiencies include surveillance tests that did not adequately confirm the operability of the safety functions, weak maintenance programs, and specific equipment deficiencies. Because many of these deficiencies were unknown for many years, the assessments also revealed weaknesses in how system material condition walk-downs were performed. As an added benefit, some assessments showed potential design flaws that could have precluded the equipment from operating as intended.

DOE also revised their directives to include a requirement for contractors to establish a system engineer program. The sites have begun implementing this program, ensuring that they have trained and qualified their systems engineers for the vital safety systems assigned to those engineers. Although this is a positive effort to ensuring operability of vital safety systems, initial on-site reviews by the Board's staff show a wide variance in the quality of these programs. The Board will continue to work with DOE to strengthen these key programs.

The DOE effort to establish their federal subject matter experts responsible for oversight of vital safety systems has made limited progress. While the DOE Federal Technical Capabilities Panel gave the Board detailed information on the personnel responsible for given systems and the number of additional personnel required to provide the necessary oversight of the vital safety systems, several site staffing plans did not adequately reflect this analysis, nor are there indications that DOE is taking serious steps to obtain these additional staff.

Overall, DOE has made noticeable improvements in making sure that the vital safety systems remain effective to protect the environment, the public, and the workers. However, significant work remains to be accomplished by DOE and the contractors.

Stabilization of Legacy Nuclear Materials. During the era of weapons production, plutonium and other weapon materials were in demand as feed materials, and plutonium-rich scrap from weapon fabrication processes was quickly recycled. This situation changed dramatically as DOE began to shut down weapon production activities at many defense nuclear facilities. As a result, substantial quantities of plutonium, uranium, transuranic isotopes, and irradiated fuel have remained in storage for extended periods under potentially unsafe and deteriorating conditions. To address this situation, the Board's Recommendation 94-1 counseled DOE to process these materials on an accelerated basis, converting them to stable forms and then packaging them for safe interim storage, pending decisions about their ultimate disposition. The Board followed this recommendation with Recommendation 97-1, which addressed highly radioactive uranium-233 materials held at several DOE defense nuclear facilities, and Recommendation 2000-1, which reemphasized the importance of the legacy materials stabilization mission, established priorities for

the significant quantity of materials remaining to be stabilized under Recommendation 94-1, and recommended that, as required by law, DOE identify and report funding shortfalls that prevented more timely action.

Significant risk reduction and stabilization of materials have been accomplished under the legacy nuclear materials program. A large portion of the plutonium solutions and residues, special isotopes, and irradiated fuel and targets have been stabilized. However, significant hazards remain, key stabilization activities have been delayed, and technical and programmatic difficulties threaten to cause further delays in risk reduction.

In March and November of 2001, the Board issued correspondence to DOE identifying the principal problems remaining in the planning and execution of the materials stabilization program, and suggesting methods by which improvements could be made. Following continued urging by the Board, DOE produced an improved Implementation Plan for Recommendation 94-1 in July 2002.

The plan is DOE's best effort to date, but numerous milestones are being delayed, and the plan and schedule for activities at Los Alamos National Laboratory (LANL) remain unsatisfactory. In August 2002, the Board again suggested a more effective strategy for addressing legacy materials at LANL.

The Board has also begun to evaluate materials not addressed under Recommendations 94-1, 97-1, and 2000-1 which also may require timely stabilization and disposition in order to prevent new hazards from developing. The Board determined that the National Nuclear Security Administration (NNSA) is managing a substantial inventory of nuclear materials without identified programmatic applications, and that more comprehensive evaluation and life-cycle planning is needed to avoid future problems similar to those that prompted the issuance of the Board's Recommendations discussed above. The Board transmitted its findings to DOE in May 2002, and established a requirement for DOE to report by September 2002 on the steps that will be taken to improve the management of such materials stored at the weapons laboratories and other NNSA facilities.

4. FUTURE CHALLENGES FOR THE BOARD'S SAFETY OVERSIGHT

The following discussion addresses some of the key challenges facing the Board in its safety oversight of DOE that will require continuing attention by the Board and its staff. The Board's budget request for \$19,559,000 and associated performance plans in Appendix D have been structured to meet these projected workload challenges.

A number of new design and construction projects scheduled during the next decade are aimed at providing support for the nuclear weapons stockpile, as well as resolving the remaining health and safety issues that are the historical legacy of weapons production. Examples include the Highly Enriched Uranium Materials Facility at the Y-12 National Security Complex, the Tritium Extraction Facility at the Savannah River Site, and the Waste Treatment Plant at the Hanford Site. The Board's enabling statute requires that it review the design, construction, and operation of new defense nuclear facilities, and make timely recommendations to the Secretary of Energy on any

needed public health and safety improvements. This significant projected increase in work load for projects in the design phase will make substantial demands on the Board's resources in such areas as design, safety analysis, and operations (see Section 5, Oversight of DOE Design and Construction Projects, for a more detailed representation of the significance, complexity, and risks of the DOE design and construction programs).

To maximize the efficient use of its resources in direct support of the nuclear weapons stockpile, DOE/NNSA is developing a strategy that will change the balance and location of some defense nuclear work throughout the complex. As this strategy is implemented, some sites that have seen lesser amounts of nuclear work in recent years (such as Lawrence Livermore National Laboratory and the Nevada Test Site) will be required to significantly increase the tempo of their efforts. Safely implementing the transfer of hazardous defense nuclear activities between sites—with the associated need to ensure competent personnel, rigorous authorization basis control, and effective operational safety management—will pose many challenges to DOE and its contractors, as well as associated oversight challenges to the Board.

The Board's oversight activities continue to reveal technical issues that have the potential to affect the safety of activities related to management of the nuclear weapons stockpile. For example, in response to the Board's initiative, DOE is reconstituting its ability to safely dispose of a damaged nuclear weapon at the Nevada Test Site. DOE has taken substantial steps to prepare a safe location to store and assess damaged nuclear weapons, but the completion of planned additional facility improvements, process refinements, and training is still necessary and will require attention by the Board and its staff.

DOE, in cooperation with the Department of Defense, is working to define the research, development, and manufacturing infrastructure that will be necessary to support the enduring stockpile in the absence of critical nuclear testing. Tritium extraction for stockpile use, the conduct of nuclear experimentation, and the production of new pits will require the Board to conduct health and safety oversight of new defense nuclear operations throughout the next decade and beyond. In addition, DOE is ramping up its programs to extend the life of weapons in the enduring stockpile. These life extension programs will require more, and increasingly complex, operations to disassemble, refurbish, reassemble, and re-certify nuclear weapons and components than had been done in the recent past when smaller numbers of weapons were disassembled only for inspection. In addition to larger numbers of unit operations, DOE will also be required to develop or restart complex and potentially hazardous operations to refurbish or re-manufacture individual weapon components. To effectively oversee these operations and at the same time strike a proper balance among national security requirements, schedules, and safety management issues, the Board will need to maintain and at times augment its technical staff with individuals who possess the necessary expertise.

Many of DOE's hazardous defense nuclear facilities include safety systems whose reliable operation is vital to ensure the safety of the public, the workers, and the environment. The availability, reliability and operability of such safety systems and the conditions specifying operational limits are, in most cases, included in the written agreements established by DOE with its contractors as conditions for authorizing performance of work. In response to the Board's recommendations, DOE completed an initial assessment of the vital safety systems in its high priority defense nuclear facilities and a more in-depth assessment of specific systems and attributes (e.g.,

engineering drawing control and configuration management). DOE has identified potential problems in the operability of several systems, and in some cases the need for repair of systems, to ensure their continued operability. The Board's continued vigilance and oversight will be required to ensure that DOE and its contractors accomplish the significant work necessary to improve the operability and reliability of these vital safety systems.

The mission to conduct high-risk activities associated with facility deactivation will continue across the DOE defense nuclear complex at an increasing rate in the coming years. These activities involve hands-on hazardous work that requires hazards evaluation, development of work controls and procedures, worker training, and good conduct of operations. The Board's continued attention and increased commitment of resources will be required to ensure that DOE safely conducts these high-risk activities.

In response to the Board's urging and guidance, DOE has made considerable progress toward the development of programmatic direction for an Integrated Safety Management (ISM) approach to its hazardous nuclear activities. However, independent internal DOE reviews, as well as observations by the Board and its staff, indicate that extensive experience, feedback, and improvement will be required before effective implementation of ISM and its associated cultural changes are fully realized across the entire DOE defense nuclear complex. The Board will need to devote significant resources to oversight of DOE and its contractors to ensure that the ISM gains already achieved are continued.

Following considerable oversight and constructive engagement by the Board, DOE is pursuing stabilization and disposition of the hazardous remnants of nuclear weapons production. Substantial progress is being made toward characterizing, stabilizing, and dispositioning many high-hazard nuclear materials, and several associated new facilities are either in design, construction, or initial operation. However, DOE is encountering difficulty in maintaining its momentum in all areas of this important risk reduction effort. The Board will continue to urge DOE to maintain, and in some areas accelerate, its activities associated with these risk reduction activities. Additionally, DOE has suspended operations at the F-Canyon facility at the Savannah River Site, a significant resource for the stabilization of nuclear materials. The Board and its staff have strongly urged DOE to establish well-defined disposition paths for materials that might have gone to F-Canyon, and will continue to review DOE efforts in this area.

Since the end of the Cold War, maintaining the technical competence of federal and contractor personnel essential to DOE's defense nuclear mission has been an increasingly difficult task. While the Board has always placed considerable emphasis on this vital aspect of safety management, skilled employees continue to leave the workforce. The turnover in senior DOE leadership that resulted from the years of Government downsizing and curtailed investments in human capital will necessitate close attention to rebuilding the appropriate technical skills, abilities, and experience. The Board will need to apply significant resources to ensure that DOE recruits and develops the required technical capabilities, and that the new line management emphasizes safety in the conduct of its operations.

Work in the above areas is essential to the fulfillment of the Board's mission and is assumed in its strategic planning. The Board's resources are already fully committed to existing safety activities, and accommodating this additional work will be challenging within the budget. The Board is

recruiting technical personnel possessing additional and varied safety expertise to address the changing and expanding scope and nature of DOE's planned work, as well as to meet our own workforce succession planning needs.

5. OVERSIGHT OF DOE DESIGN AND CONSTRUCTION PROJECTS

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 manner that will support safe and efficient operations for 20 to 50 years. This requires a robust design process that will ensure appropriate safety controls are identified and properly implemented early in the process. Integrated Safety Management (ISM) provides the framework for this process. The Board's expectation is that the design and construction phases of defense nuclear facilities will demonstrate clear and deliberate implementation of ISM principles and core functions; and that this will be clearly codified in manuals of practice, and implemented on design and construction projects.

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 following examples describe some major DOE defense nuclear facilities and projects, completed prior to the Board's formation, that had significant safety-related design and construction issues, as well as more recent examples of facilities where the Board identified and worked with DOE to resolve issues prior to the completion of the facility.

Projects Completed Prior to Board Formation:

- The Nuclear Materials Storage Facility at LANL was originally constructed to store the laboratory's special nuclear material. After completion of construction, it was determined that the facility could not be operated safely due to an improperly configured ventilation system. Also, special nuclear material would have to pass through administrative areas from the truck unloading area to storage rooms, and the wall coatings, originally applied to prevent adhesion of radioactive contamination, were peeling even before the facility was completed.
- Building 371 at Rocky Flats was originally intended to replace the aging chemical processing capabilities of Building 771. Due to numerous design and construction deficiencies, such as improperly routed piping between process vessels that resulted in misdirected flows and improperly designed process equipment, the facility was declared inoperative and never replaced Building 771.

Projects Developed Since the Board's Formation:

- The In-Tank Precipitation Facility at Savannah River Site was designed to pre-treat waste by removing cesium from the salt solution by the addition of tetraphenylborate (TPB). Original projections indicated that benzene, a potentially flammable and explosive by-product of this process, could be controlled and would not pose a hazard. However, the Board's review identified significant uncertainty in the understanding of the decomposition of TPB and its impact on safety. This ultimately led DOE to determine that the benzene generation could not be safely controlled and the project was subsequently cancelled.

- The Highly Enriched Uranium Materials Facility at the Y-12 National Security Complex is being designed to provide long-term consolidated storage. Review of the conceptual design of the facility disclosed a number of design weaknesses. Although the facility must be capable of withstanding an earthquake, the Board determined that the proposed structural configuration would not safely resist seismic forces. Additional strengthening was provided. Additional design deficiencies were identified by the Board concerning the ability to maintain a criticality-safe configuration of the uranium storage cans. As a result, the storage design was reconfigured to render it safe from seismic forces.
- The Board's review of the preliminary design of the Sandia Underground Reactor Facility found that the design did not properly address worker exposure to radiological hazards. Early identification of hazards is important to ensure the safety of co-located workers. The National Nuclear Security Administration subsequently cancelled this project in 2002.

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 numerous 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).

- **Los Alamos National Laboratory - TA-18 Mission Relocation** - to relocate and 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 - Emergency Operations Center Replacement and Relocation** - to provide a new emergency operations center capable of operationally and logistically supporting personnel required to man the center during prolonged emergency activities. MODERATE SIGNIFICANCE, LOW COMPLEXITY, LOW 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.

- **Office of River Protection (Hanford) - 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.
- **Office of River Protection (Hanford) - 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.
- **Richland Operations Office (Hanford) - 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.
- **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 repackage 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.
- **Idaho Operations Office - Idaho Waste Vitrification Facilities** - to provide vitrification capacity for treating and packaging existing high level wastes for permanent storage. HIGH SIGNIFICANCE, HIGH COMPLEXITY, HIGH RISK.
- **ORNL Melton Valley Transuranic/Alpha Tank Waste Treatment Project** - to retrieve, treat, and dispose of wastes from the ORNL Melton Valley Tanks. MODERATE SIGNIFICANCE, MODERATE COMPLEXITY, MODERATE RISK.
- **INEEL Advanced Mixed Waste Treatment Project** - to retrieve, treat, and dispose of waste drums from INEEL. MODERATE SIGNIFICANCE, MODERATE COMPLEXITY, MODERATE RISK.
- **Savannah River Site Actinide Removal Process** - to modify an existing facility (Late Wash Facility) to install equipment to remove actinides from high-level waste prior to treatment at the Salt Waste Processing Facility or disposal at the Saltstone Production Facility. HIGH SIGNIFICANCE, MODERATE COMPLEXITY, MODERATE RISK.

6. CONCLUSION

In establishing the Board, Congress and the President intended that the Board ensure and improve the safety of operations of DOE's defense nuclear facilities by providing independent, expert advice to the Secretary of Energy, identifying the nature and consequences of any significant potential threats to public health and safety, and elevating such issues to the highest levels of authority.

The five full-time Board Members, together with a small but highly competent staff, provide a cost-effective organizational arrangement for achieving the added safety assurance that the public seeks and rightfully expects. The Board's budget request of \$19,559,000, to be used for staff salaries and required overhead expenses, such as travel to DOE's defense nuclear facilities and maintaining our on-site presence with the Board's site representatives, will provide the funding needed to support the health and safety review actions planned by the Board for Fiscal Year 2004. This amount 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.

STATUTORY MISSION OF THE BOARD

Congress established the Defense Nuclear Facilities Safety Board (Board) in Public Law 100-456 of September 29, 1988. Created as an independent establishment within the Executive Branch, the Board is made up of five Members appointed from civilian life by the President, by and with the advice and consent of the Senate. The Board's enabling statute requires that the Board Members be respected experts in the field of nuclear safety with demonstrated competence and knowledge relevant to the independent investigation and oversight functions of the Board. The Senate confirmed the first five Board Members on October 19, 1989. The statutory mission of the Board includes the following major functions:

- **Review and Evaluation of Standards.** The Board shall review and evaluate the content and implementation of the standards relating to the design, construction, operation, and decommissioning of defense nuclear facilities of the Department of Energy (DOE), including all applicable DOE Orders, regulations, and requirements at each Department of Energy defense nuclear facility. The Board shall recommend to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected. The Board shall include in its recommendations necessary changes in the content and implementation of such standards, as well as matters on which additional data or additional research is needed.
- **Investigations.** The Board shall investigate any event or practice at a Department of Energy defense nuclear facility which the Board determines has adversely affected, or may adversely affect, public health and safety.
- **Analysis of Design and Operational Data.** The Board shall have access to and may systematically analyze design and operational data, including safety analysis reports, from any Department of Energy defense nuclear facility.
- **Review of Facility Design and Construction.** The Board shall review the design of a new Department of Energy defense nuclear facility before construction of such facility begins and shall recommend to the Secretary of Energy, within a reasonable time, such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety. During the construction of any such facility, the Board shall periodically review and monitor the construction and shall submit to the Secretary of Energy, within a reasonable time, such recommendations relating to the construction of that facility as the Board considers necessary to ensure adequate protection of public health and safety. An action of the Board, or a failure to act, under this paragraph may not delay or prevent the Secretary of Energy from carrying out the construction of such a facility.

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

OBJECT CLASS SUMMARY

Actual obligations for FY 2002, projected financial plan for FY 2003, and the Board's Budget Request for FY 2004 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 2004 expenditure request includes funding of \$14,540,000 to support the projected salary and benefit costs for 102 FTEs. The funding for salaries and benefits represents 74 percent of the Board's FY 2004 Budget Request. 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 3.1 percent beginning in January 2003.
- Pay increase of 2.4 percent beginning in January 2004.
- Employee benefits of 26 percent of salaries, or \$29,370 per FTE in FY 2004.

The Administration plans to resubmit a legislative proposal to Congress that would increase agency costs for accruing employee CSRS pension costs and annuitant health benefits for all employees, while reducing reported costs from central mandatory accounts by an equal amount. (See Exhibit B for an explanation of the Administration's legislative proposal.) The estimated cost of this proposal for the Board would require an additional \$551,000 in budget authority for FY 2004. For comparison purposes, comparability estimates for FY 2002 and FY 2003 for this legislative proposal are calculated below:

	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>
Civil Service Retirement System Employees (CSRS)	\$159,246	\$155,981	\$185,995
Federal Employee Health Benefits (FEHB)	<u>\$280,146</u>	<u>\$302,879</u>	<u>\$364,997</u>
TOTAL	\$439,392	\$458,860	\$550,992

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 has and will continue to be critical to the successful accomplishment of the Board's mission. The Board has assembled a small 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 weapons safety, storage of nuclear materials and nuclear criticality safety, and waste management. As an indication of the Board's technical talent, 87 percent of the Board's technical and legal staff hold advanced degrees, of which 29 percent are at the Ph.D. level. Almost all technical staff members, except interns, 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. It is of paramount importance that the Board receive 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. Full-time site representatives are stationed at the following DOE sites: 1) Pantex site 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) Rocky Flats to monitor the DOE effort to deactivate facilities and stabilize/store the large plutonium inventory at the site; 4) Savannah River Site to monitor the DOE's efforts to deactivate facilities, stabilize waste materials, and store and process tritium; 5) Oak Ridge Y-12 to monitor safety and health conditions at Y-12 and other defense nuclear facilities in the area; 6) 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.

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 first-hand 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 \$628,000 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 fulfill the Board's statutory mission. 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 approximately 154 team visits in FY 2002, to major defense nuclear sites in support of its high priority public health and safety 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 the Hanford Waste Treatment Facility, in addition to installation and testing of fire protection improvements at Lawrence Livermore, Pantex and Los Alamos.

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 inquiry.

Transportation of Things. The Board has included \$92,000 in its FY 2004 Budget Request for the shipment of household goods for employees relocating to the Washington, DC area or to DOE sites.

Rental Payments to GSA. The Board requests funds totaling \$2,329,000 to reimburse the General Services Administration (GSA) for projected office rental costs and GSA-provided physical security of the property. This overhead expense represents approximately 12 percent of the Board's FY 2004 Budget Request.

Communications and Utilities. The FY 2004 Budget Request includes \$219,500 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.

Printing and Reproduction. The budget request includes \$20,000 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 the 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 102 FTEs and employed only 96 full-time staff as of September 30, 2002. While the Board strives to maintain a highly skilled staff, it is not practical or desirable to maintain permanent staff in all possible disciplines. Therefore, it is important to have the funds available to immediately contract for this expertise when needed. For example, following review of construction plans for the High Level Waste Treatment Facility at Hanford, the Board concluded that concrete reinforcement issues had not been adequately addressed by DOE. The Board obtained outside contractor expertise in the area of concrete reinforcement and loading to augment its review and avoid any adverse impact on DOE's construction schedule.

The Board plans to continue contracting for outside 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 outside 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 is included in Appendix C. The FY 2004 Budget Request includes \$750,000 in this account for technical support contracts to assist the Board in its health and safety reviews.

Other Services. The budget request includes \$1,211,000 to fund the recurring administrative support needs of the Board in FY 2004 such as physical security, cyber security, information technology operations, employee training, court reporting and records storage and retrieval.

Government Services. The Board's budget request includes \$200,000 for reimbursable support agreements for administrative services such as accounting, payroll, health unit, and drug-free workplace testing and support.

Supplies and Materials. The Board requests \$280,000 to maintain the technical reference information for its in-house library, as well as for continued access to various technical standards databases, legal research services and for general office supplies and materials.

Equipment. The FY 2004 Budget Request includes \$306,000 to maintain the Board's information technology (IT) security and infrastructure. The Board will purchase upgraded fire-wall protection and improved communications equipment. In addition, the Board will continue to replace equipment that has reached the end of its life cycle and expend funds for technologies that provide a greater outreach to the public.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

FY 2004 CONGRESSIONAL BUDGET REQUEST - 2/03/2003

BUDGET ACCOUNT	COST ELEMENT	FY 2002 OBLIGATIONS (ACTUAL)	FY 2003 FINANCIAL PLAN	FY 2004 PROJECTED BUDGET REQUEST
PERSONNEL SALARIES -- (11)		\$ 9,954,810	\$ 10,641,500	\$ 11,544,629
PERSONNEL BENEFITS -- (12)		\$ 2,619,945	\$ 2,801,590	\$ 2,995,775
TRAVEL -- (21)		\$ 623,185	\$ 628,000	\$ 628,000
TRANSPORTATION OF THINGS -- (22)		\$ 140,646	\$ 108,000	\$ 92,000
RENTAL PAYMENTS TO GSA -- (23.1)		\$ 2,325,761	\$ 2,314,000	\$ 2,329,000
COMMUNICATIONS & UTILITIES (23.3)		\$ 207,520	\$ 219,500	\$ 219,500
PRINTING & REPRODUCTION -- (24)		\$ 18,027	\$ 20,000	\$ 20,000
CONSULTING SERVICES -- (25.1)		\$ 1,940,083	\$ 1,000,000	\$ 750,000
OTHER SERVICES -- (25.2)		\$ 1,165,784	\$ 1,261,000	\$ 1,211,000
GOVERNMENT SERVICES -- (25.3)		\$ 190,167	\$ 200,000	\$ 200,000
SUPPLIES & MATERIALS -- (26)		\$ 277,677	\$ 280,000	\$ 280,000
CAPITAL ASSETS -- (31)		\$ 306,614	\$ 306,000	\$ 306,000
*** TOTAL OBLIGATIONS ***		\$ 19,770,220	\$ 19,779,590	\$ 20,575,904
NEW BUDGET AUTHORITY		\$ 18,486,000 *	\$ 19,000,000	\$ 19,559,000
UNOBLIGATED BALANCE - PREV. FY		\$ 2,687,460	\$ 2,928,434	\$ 2,148,844
RECOVERY OF PRIOR YR OBLIGATIONS		\$ 1,525,194	\$ -	\$ -
TOTAL BUDGETARY RESOURCES		\$ 22,698,654	\$ 21,928,434	\$ 21,707,844
EST. UNOBLIGATED BAL. - CUR. FY		\$ 2,928,434	\$ 2,148,844	\$ 1,131,940
APPROPRIATION		\$ 18,486,000	\$ 19,000,000	\$ 19,559,000
OUTLAYS		\$ 19,773,364	\$ 19,053,000	\$ 19,503,000
STAFF & BOARD MEMBERS (FTE'S)		95	98	102

*\$18,500,000 appropriation; \$14,000 rescission

EXHIBIT A

The Administration's Requirement to Fully Accrue Federal Employees Retirement Costs

The President plans to resubmit a legislative proposal to correct a long-standing understatement of the true cost of literally thousands of government programs. For some time, the accruing charge of the Federal Employee Retirement System (FERS) and Military Retirement System (MRS) costs and a portion of the old Civil Service Retirement System (CSRS) costs has been allocated to the affected salary and expense accounts, and the remainder (a portion of CSRS, other small retirement systems, and all civilian and military retiree health benefits) has been charged to central accounts. The full cost of accruing benefits should be allocated to the affected salary and expense accounts, so that budget choices for program managers and budget decision makers are not distorted by inaccurate information. Under this legislative proposal, agencies will also, for the first time, be charged for the accruing cost of retiree health care benefits for all civilian employees.

The budget presents the amounts associated with shifting this cost from central accounts to affected program accounts, starting in FY 2004. The amounts associated with the proposal are shown on a comparable basis for program accounts in FY 2002 and FY 2003.

The proposal does not increase or lower total budget outlays or alter the surplus/deficit since the higher payments will be offset by receipts in the pension and health funds. The shift will reduce reported costs from central mandatory accounts and increase reported costs in the affected discretionary accounts. Consequently, these costs will be properly reported in the budget for the first time and considered as an annual cost of managing these programs, as they should be.

The Administration will oppose any attempt to divert the additional funding from the intended purpose and instead use it to fund programmatic increases. Therefore, the Administration proposes that the additional funding be fenced or held in a reserve and only be made available to the committees of jurisdiction for the specific purpose of adjusting for the understatement of costs.

This change in treatment of costs is the first in a series of steps that will be taken to ensure that the full annual cost of resources used - including support services, capital assets and hazardous waste - is charged properly in the budget presentation.

TECHNICAL SUPPORT CONTRACTS SUMMARY

A list of major technical support contracts, with a brief description of each contractor's areas of expertise, is included in this Appendix. The FY 2004 Budget Request includes \$750,000 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 1/21/03)

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Dr. Harold M. Agnew	12/15/03	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 weapons systems.
Mr. Richard Collier	09/30/03	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 J. DiNunno	10/03/03	Provide technical assistance in reviewing, evaluating, and advising the Board on issues related to Integrated Safety Management (ISM) programs at defense nuclear facilities.
Dr. Kevin J. Folliard	10/10/03	Provide expertise related to structural performance 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	06/30/03	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.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Dr. Herbert Kouts	12/31/03	Provides a variety of technical expertise on a wide range of subjects associated with safety at DOE's defense nuclear facilities, including: safety management, criticality, DOE's 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	12/31/03	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 recent work include: evaluation of technologies to stabilize plutonium residues, plutonium storage safety issues, and Rocky Flats plutonium stabilization activities.
Dr. James L. Liverman	04/30/03	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, and other radiological and environmental health and safety issues, implementation of Recommendation 2000-2, and reviewing the development of DOE's quality assurance improvement plan."
Lary M. McGrew	01/31/04	Provide expertise related to the strategic 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.
Management Support Technologies, Incorporated	02/28/04	Provides technical support to the Board, specifically involving the evaluation of directives and procedures governing the 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 Nuclear Security Complex, and the Hanford site.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Paul C. Rizzo Associates, Inc.	12/31/03	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 Engineer	12/31/03	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.
Briere Associates, Inc.	09/30/03	Provide technical editing services of Board documents that include, but are not limited to technical reports, trip reports, the Board's Reports to Congress, and formal Board Recommendations to DOE. These services include analyzing manuscripts in terms of communications effectiveness, diction, grammar, style, and manner of presentation and recommending revisions as appropriate.

ANNUAL PERFORMANCE PLAN FOR FY 2004

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.

As outlined in the Board's Strategic Plan (available on the Internet at www.dnfsb.gov), the Board's statutory mission is logically divided along the lines established by the three general goals:

1. **Complex-Wide Health and Safety Issues.** Integrated safety management (including comprehensive health and safety requirements, technically competent personnel, and effective implementing mechanisms) continues to evolve through feedback and improvement, and is implemented in all life cycle phases—design and construction, startup, operation, and decommissioning.
2. **Safe Stewardship of Nuclear Weapons Stockpile and Components.** Nuclear weapons stockpile support and defense nuclear research activities continue to be planned and executed safely at DOE's defense nuclear facilities.
3. **Safe Disposition of Hazardous Remnants of Weapons Production.** Hazardous remnants of nuclear weapons production are appropriately characterized, stabilized, and stored; and legacy facilities are decommissioned in a manner that protects the worker, the public, and the environment.

The Board's Strategic Plan establishes the framework for making management decisions, and describes what the Board plans to do each year to progress toward achievement of each of these three general goals. In planning its work, the Board and its staff have developed a set of seven strategic objectives that, in aggregate, implement the Board's general goals. The relationship between these goals and objectives is discussed in the Board's Strategic Plan.

To facilitate strategic management, the Board has organized its technical staff into three groups. The technical lead of each group is assigned responsibility for one of the three general goals in the Strategic Plan, and for executing the strategic 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 and its technical leadership have produced measurable performance goals for Fiscal Year (FY) 2003 and FY 2004 that, when executed, will demonstrate continued progress toward the Board's strategic objectives, and consequently toward its general goals. These annual performance goals and measures establish projected levels of performance and reflect the nature of the Board's independent oversight function.

All of the Board's general goals and objectives 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 2004 identifies annual performance goals for each strategic objective that consist of reviews to be conducted in support of each objective, plus the identification of candidate areas for these reviews. An outcome measure for each objective is described as part of the discussion of each annual performance goal. Qualitative assessments of the outcome associated with each annual performance goal are provided in 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.
- 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/or 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 experience, developed during the last 13 years of reporting progress to Congress in the Board's Annual Reports, has shown that it is possible to conduct a retrospective assessment of Board-identified issues and associated DOE responses that demonstrates the Board has had a clear and positive impact on the safety culture within DOE.

Because of the variability of DOE's plans and schedules, some candidate areas identified in the Board's Annual Performance Plans 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 Appendix D are formatted to show the flow-through from the general goals set forth in the Board's Strategic Plan to strategic goals and objectives and specific annual performance goals for FY 2003 and FY 2004. To place this planning information in context, the tables also provide examples of the Board's accomplishments during the years FY 1999 through FY 2002, as required by OMB's guidance on Performance Plans. These examples do not represent the entire scope of progress made on the FY 2002 performance goals. A comprehensive assessment of progress during calendar year (CY) 2001 appears in the Board's Twelfth Annual Report. The Thirteenth Annual Report, due for publication in early 2003, will cover accomplishments during CY 2002.

STRATEGIC GOAL 1: COMPLEX-WIDE HEALTH AND SAFETY ISSUES

Continuing evolution of Integrated Safety Management (ISM) (including comprehensive health and safety requirements, technically competent personnel, and effective implementing mechanisms) through feedback and improvement, and full implementation of ISM in all life cycle phases—design and construction, startup, operation, and decommissioning.

The first goal addresses the Board's efforts to facilitate the complex-wide implementation of integrated safety management throughout the DOE defense nuclear complex. Achieving this goal requires a multi-year, multi-site, multi-focus effort. The three strategic objectives that support the general goal encompass a broad spectrum of technical areas relevant to the safety of DOE's defense nuclear mission.

Strategic Objective 1-A: Improvement and Integration of Health and Safety Directives. The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public. (See pages D-4 through D-9.)

Strategic Objective 1-B: Technical Competence. The Board and its staff 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. (See pages D-10 through D-15.)

Strategic Objective 1-C: Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation. The Board and its staff will verify the effective and expeditious development and implementation of DOE's ISM program. (See pages D-16 through D-21.)

GOAL 1 — Complex-Wide Health and Safety Issues

<p>Objective</p>	<p>Improvement and Integration of Health and Safety Directives. The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.</p>
<p>Examples of FY 2002 Accomplishments</p>	
<p>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:</p>	
<p>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-STDs-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.</p>	
<p>Software Quality Assurance. Considerable staff resources were expended during FY 2002 in reviewing a new draft DOE Order, O-203.X, <i>Software Quality Assurance</i>. 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.</p>	
<p>Facility Representative Program. The Board's staff reviewed the qualification standard for DOE Facility Representatives (TRNG-0019, <i>Facility Representative Functional Area Qualification Standard</i>). As a result of the staff's efforts, as well as those of DOE participants, this key standard was issued expeditiously in April 2002.</p>	
<p>Emergency Management. During the latter part of 2002, the Board's staff provided comments on DOE's draft order on emergency management, DOE O 151.1B, <i>Comprehensive Emergency Management System</i>. In addition, the staff reviewed and commented on revisions to an associated DOE Manual addressing programs for coping with: (1) on-site emergencies involving hazardous materials at fixed facilities, and (2) off-site 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.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-A:

Improvement and Integration of Health and Safety Directives. The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.

FY 2003 Performance Goals

In its review of DOE's ongoing biennial review cycle of its directives, the Board and its staff will continue to assess the adequacy of those directives to ensure that any proposed revisions are appropriate and adequate. The results of reviews completed by the Board and its staff will be provided to DOE for consideration and action.

The Board anticipates that approximately 30 DOE directives will require review, of which 2 or 3 are likely to have major significance. For those few in this category, significant effort by the Board and its staff is expected to be needed to ensure satisfactory resolution of identified issues.

The Board's staff will continue to engage responsible DOE staff members in seeking timely resolution of previously submitted comments from the Board and its staff on draft DOE Order, O-203.X, *Software Quality Assurance*. These efforts are aimed at issuance of an approved version of this key order in FY 2003.

DOE's program for the maintenance and upgrading of its directives is expected to have reached a stage of relative maturity by FY 2003, particularly those directives aimed at integrated safety management. The Board and its staff will continue to scrutinize proposed changes in requirements and guidance set forth in DOE's directives program to ensure that there is no reduction in their rigor. In this regard, the Board and its staff will be especially attentive to those requirements and guidance associated with facility safety during operation and in post-operation activities, especially in the content of authorization basis documentation for new facilities or those undergoing major renovation or mission changes.

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.


GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-A:	<p><u>Improvement and Integration of Health and Safety Directives.</u> The Board and its staff will verify that new and revised DOE directives contain adequate requirements for the protection of the health and safety of the workers and the public.</p>
FY 2004 Performance Goals	
<p>In its review of DOE's ongoing biennial review cycle of its directives, the Board and its staff will continue to assess the adequacy of proposed changes to those directives to ensure that any revisions are appropriate and adequate. The results of reviews completed by the Board and its staff will be provided to DOE for consideration and action.</p>	
<p>The Board anticipates that approximately 25 DOE directives will require review, of which 2 or 3 are likely to require significant Board and staff interaction to ensure satisfactory resolution of potential issues.</p>	
<p>DOE's program for the maintenance and upgrading of its directives is expected to have reached a stage of relative maturity by FY 2003, particularly those directives aimed at integrated safety management. During FY 2004, the Board and its staff will continue to scrutinize proposed changes in requirements and guidance set forth in DOE's directives program to ensure that there is no reduction in their rigor. In this regard, the Board and its staff will be especially attentive to those requirements and guidance associated with facility safety during operation and in post-operation activities, especially in the content of authorization basis documentation for new facilities or those undergoing major renovation or mission changes.</p>	
<p>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.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-B:	Technical Competence. The Board and its staff 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.
Examples of FY 1999 Accomplishments	
<p>The Board continued to focus DOE's attention on the technical competence of Federal workers as an essential safety element for defense nuclear facilities. Through a revised Implementation Plan for Board Recommendation 93-3, <i>Improving DOE Technical Capability in Defense Nuclear Facilities Programs</i>, DOE formed a panel of senior line managers to implement a corporate program to recruit, develop, deploy, and retain technical capability at defense nuclear facilities. The panel members self-assessed the Technical Qualification Programs at their respective sites, and took the necessary actions to upgrade their plans and procedures. The panel also identified 686 critical technical positions and took administrative actions to preserve nearly all of these positions against downsizing efforts.</p> <p>Significant accomplishments were made by DOE as a result of implementing Board Recommendation 97-2, <i>Criticality Safety</i>. Training and qualification programs for both DOE and contractor criticality engineers were established including high quality qualification standards. The operation of the Los Alamos National Laboratory critical facility was revamped for training of criticality safety engineers and for the development of intermediate range neutron energy data for critical assemblies. These activities provide vital information for understanding and characterizing the unique hazards and for developing proper safety controls related to nuclear criticality. Additionally, a web-site was developed for dissemination of archived data on the past 40 years of criticality experiments which will provide great benefit to the nuclear safety community.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

	<p>Technical Competence. The Board and its staff 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.</p>
Examples of FY 2000 Accomplishments	
<p>The Board continued to focus DOE's attention on the technical competence of Federal workers as an essential safety element for defense nuclear facilities. Through a revised Implementation Plan for Board Recommendation 93-3, <i>Improving DOE Technical Capability in Defense Nuclear Facilities Programs</i>, a DOE formed panel of senior line managers continued to implement a corporate program to recruit, develop, deploy, and retain technical capability at defense nuclear facilities. Many changes in DOE's mission and infrastructure have occurred since the Board issued Recommendation 93-3. The Board believes that DOE's efforts in response to this recommendation have resulted in excellent programs and processes that will be invaluable in the training and qualification of the next generation of the DOE federal workforce. On November 9, 1999, the Board closed Recommendation 93-3.</p>	
<p>The Board and its staff continued to engage DOE in regard to the development of formal training and qualification for federal and contractor criticality safety personnel resulting in the upgrade of DOE Order 420.1, <i>Facility Safety</i>, emphasizing this important aspect of criticality safety. Also, in response to Board staff concerns about the floor presence of criticality engineers, DOE directed that criticality engineers increase the number of hours spent observing work on the floor, and report these hours to headquarters and program offices responsible for the site.</p>	
<p>The Board and its staff continued to interact directly with cognizant DOE representatives to ensure a satisfactory path to closure of Board Recommendation 97-2, <i>Continuation of Criticality Safety</i>, especially with regard to the development of an adequate curriculum and the criticality safety training of sufficient numbers of contractor and federal employees.</p>	
<p>Working closely with the Board and its staff, DOE has upgraded DOE Order 360.1A, <i>Federal Employee Training</i>, and DOE-STD-1063-2000, <i>Facility Representatives</i>, as elements of the revised Implementation Plan for Board Recommendation 93-3, <i>Improving DOE Technical Capability in Defense Nuclear Facilities Programs</i>. DOE further institutionalized its technical personnel processes with the issuance of DOE M 426.1-1, <i>Federal Technical Capability Manual</i>.</p>	
<p>The Board emphasized the vital importance that a technically-competent work force plays in ensuring public and worker health and safety.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-B:

Technical Competence. The Board and its staff 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.

Examples of FY 2001 Accomplishments

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.

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.

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 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*.

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-B:

Technical Competence. The Board and its staff 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.

Examples of FY 2002 Accomplishments

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 and the Board is conducting a series of reviews at Y-12, Pantex, Hanford, and the Lawrence Livermore National Laboratory to evaluate the quality and effectiveness of the 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 continued 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 on-site 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, *Criticality Safety*.

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.

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*. In a letter dated January 31, 2002, the Board noted that many constructive steps had been taken to establish a disciplined process for responding to DOE independent oversight findings. However, additional effort was warranted in the establishment of Functions, Responsibilities, and Authorities documents in a number of DOE organizational elements. As a result of the Board's concerns, DOE program offices are revising their FRA documents to ensure safety roles and responsibilities are clearly defined.

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-B:

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

FY 2003 Performance Goals

The Board and staff will conduct at least four assessments from among the following types:

- Assess whether competence is commensurate with assigned responsibilities for key safety personnel at defense nuclear contractor organizations involved in such areas as, but not limited to, fire protection engineers, system engineers, or radiation protection personnel.
- Investigate the integration of human factors engineering principles with respect to the design, operation, and maintenance of defense nuclear facilities, and with emphasis on implementation, use, appropriateness, and effectiveness of administrative controls in lieu of safety-class passive design features and engineered safety features. Site reviews will be conducted to provide specific details regarding the status of human factors engineering issues in the DOE complex.
- Assess the effectiveness of DOE's project manager qualification program at DOE headquarters office and DOE sites, including its depth and level of technical rigor.
- Evaluate the degree to which DOE and its contractors have implemented measures to ensure a viable criticality safety infrastructure, including progress toward qualification of contractor criticality safety engineers, through DOE site reviews.

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

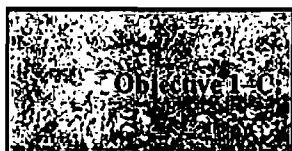
GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-B:	Technical Competence. The Board and its staff will verify that roles, responsibilities, experience, and competencies required to protect the workers and the public are explicitly defined and implemented for both DOE and its contractor personnel.
FY 2004 Performance Goals	
The Board and staff will conduct at least four assessments from among the following types:	
<ul style="list-style-type: none"> • Assess whether competence is commensurate with assigned responsibilities for key safety personnel at defense nuclear contractor organizations involved in such areas as, but not limited to, fire protection, system engineering, and radiation protection. • Evaluate the principles of human systems integration with respect to the selection and incorporation of human engineering requirements into the design, operation, and maintenance of defense nuclear facilities, associated safety systems, administrative controls, and work control processes. Site reviews and reviews of documented safety analyses will be conducted to evaluate specific details regarding the status of human systems engineering issues in the DOE complex. • Assess the effectiveness of the training and qualification program, including its depth and level of technical rigor, at DOE headquarters office and DOE sites for key DOE safety personnel involved in such areas as, but not limited to, project management, system engineering, and senior technical safety management. • Evaluate the degree to which DOE and its contractors have implemented measures to ensure a viable criticality safety infrastructure, including progress toward qualification of contractor criticality safety engineers, through DOE site reviews. 	
Results of assessments will be communicated to DOE to enhance understanding of safety-related roles and responsibilities in support of DOE's execution of functions associated with protecting the worker and the public, and to be used by DOE to upgrade the quality of its technical workforce.	

GOAL 1 — Complex-Wide Health and Safety Issues

<p>Objective 1-C</p>	<p><u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u> The Board and its staff will verify the effective and expeditious development and implementation of DOE's Integrated Safety Management (ISM) program.</p>
<p>Examples of FY 1999 Accomplishments</p>	
<p>Reviews by the Board and its staff identified shortcomings in the Hanford Spent Nuclear Fuel Project that included the continued lack of sound project management, despite several high level management changes; poor implementation of quality assurance requirements; and an inability to identify and resolve emerging technical issues in a timely manner. Continued Board and staff pressure through correspondence and face-to-face meetings has led to some progress on these concerns, but continuing attention is needed.</p>	
<p>Several key indicators for gauging progress in implementing ISM have been identified from the Board's reviews: Incorporation of ISM-related Department of Energy Acquisition Regulation (DEAR) clauses into contracts, establishment of a mutually agreed-upon requirements base as the foundation for the ISM program, development of an ISM System description that describes how the contractor will integrate the system into work practices, performance of a DOE ISM verification review, and establishment of an authorization agreement. Each of these areas received Board attention in FY 1999, not only at the 10 priority facilities called out in the Recommendation 95-2 DOE Implementation Plan but also in the 43 facilities designated in the Board's December 1997 letter as "follow-on" facilities. During the FY 1999, DOE worked to fully implement ISM at the Recommendation 95-2 priority facilities. The Board monitored and advised on the development of DEAR Clause-required ISM descriptions, which describe how the contractor will integrate ISM into work practices. To date, all sites with priority or follow-on facilities have had their ISM descriptions approved by DOE, except Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and the Pantex Plant, which are scheduled for approval by the end of the year. The Board also urged DOE to continue its efforts to define and operate to explicit control measures at the priority facilities, and enlarge its efforts to include all high and moderate hazard defense nuclear facilities. In his March 1999 memorandum on Safety-Accountability and Performance, the Secretary of Energy committed to having ISM completely in place for all DOE facilities by September 2000.</p>	
<p>In response to the Board's March 20, 1998 reporting requirement on the DOE's Feedback and Improvement Program, DOE committed to upgrading the DOE Lessons Learned process, including developing guidance on improving the complex-wide feedback and improvement programs. In addition, DOE published a revised DOE acquisition regulation that will hold a contractor's fee at risk in the event of poor safety performance. The Secretary of Energy's March 3, 1999, memorandum on Safety-Accountability and Performance tasked the newly established DOE Safety Council with developing performance standards that will be used to hold Federal personnel accountable for effective and timely ISM implementation. The Board worked closely with DOE in this effort.</p>	
<p>The Board issued Recommendation 98-1 to address the internal independent oversight element of the feedback and improvement program that the Board felt was not being adequately addressed in DOE's feedback and improvement initiatives. The Board determined that DOE's independent assessments of safety management in the field were treated largely as advisories and follow-up actions became discretionary to lower levels of DOE line management. DOE accepted this Recommendation and provided an acceptable Implementation Plan, which addresses DOE's need for a clearly defined, systematic, and comprehensive process to address and resolve safety issues identified by internal independent oversight.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues



Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation. The Board and its staff will verify the effective and expeditious development and implementation of DOE's Integrated Safety Management (ISM) program..

Examples of FY 2000 Accomplishments

Review of the preliminary design package for the Tritium Extraction Facility (TEF) project by the Board and its staff disclosed that the preliminary design did not appear to have fully implemented the hierarchy of safety controls consistent with the site's manuals of practice, and that additional consideration of this matter was merited in developing the final TEF design. For example, there appeared to be an over-reliance on administrative controls being used instead of engineered design features to provide safety functions. DOE accepted the Board's suggestions and agreed to incorporate them in the final design.

Reviews of the Hanford Spent Nuclear Fuel Project by the Board's staff identified safety issues related to safety-related ventilation systems and electrical systems at the Cold Vacuum Drying Facility. DOE addressed these issues, including addition of a diesel generator to supply safety significant power to the exhaust fans for the ventilation system, further enhancing the safety of the facility.

The Board and its staff conducted a series of review meetings on the design of the Pit Disassembly and Conversion Facility (PDCF) that identified to DOE a need for additional boreholes in the geotechnical specification to improve safety; DOE added a requirement for these boreholes to the specification. In addition, the Board noted that sand filters provide better inherent resistance to severe accidents than do high efficiency particulate air (HEPA) filters. In response, DOE committed to conduct a comprehensive study to compare the safety and cost benefits of the sand filter option with the HEPA filtration option.

The Board prepared and issued DNFSB/TECH-27, *Fire Protection at Defense Nuclear Facilities*, setting forth principles and good practices for enhancing the reliability of DOE's complex-wide fire protection program.

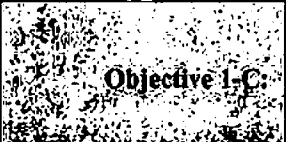
The Board's staff review of DOE's Y2K Program identified issues related to the evaluation of the safety related systems for year 2000 compliance. Programmatic issues at Los Alamos and Lawrence Livermore National Laboratories remained until the Fall of 1999 and required subsequent staff followup in late 1999. Following the improvement in DOE's Y2K program, there were no significant failures of safety-related systems at the calendar year turnover.

In response to numerous letters from the Board associated with Integrated Safety Management, DOE upgraded its Lessons Learned process, including issuing new guidance documents and development of a centralized web-based Lesson Learned database. DOE also issued a set of ISM performance indicators to provide senior DOE managers with measures of the effectiveness of ISM at their sites.

In response to Board Recommendation 98-1, *Resolution of DOE Internal Oversight Findings*, DOE implemented a formal process for dealing with safety issues identified by DOE's internal independent oversight organization. This resulted in a clearly defined, systematic, and comprehensive process for addressing and resolving these safety issues.

The Board's staff continued to critique all ISM verifications at defense nuclear facilities. These verification reviews are the processes DOE uses to evaluate the status of ISM implementation and are key to the DOE Field Managers' determinations that their sites have implemented ISM. Additional criteria for determining ISM implementation were issued by the Deputy Secretary in October 1999. The Board worked closely with DOE in defining these criteria and in evaluating DOE's efforts to implement ISM at all sites.

GOAL 1 — Complex-Wide Health and Safety Issues

 Objective 1-C	<u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u> The Board and its staff will verify the effective development and implementation of DOE's Integrated Safety Management (ISM) program.
Examples of FY 2001 Accomplishments	
<p>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, <i>Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports</i>, 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.</p>	
<p>Quality Assurance. Board interactions and correspondence with DOE, including three public meetings and the issuance of Board report DNFSB/TECH-31, <i>Engineering Quality Into Safety Systems</i>, 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.</p>	
<p>Software Quality Assurance. In January 2000, the Board's DNFSB/TECH-25, <i>Quality Assurance for Safety-Related Software at Department of Energy Defense Nuclear Facilities</i>, 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.</p>	
<p>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.</p>	
<p>Recommendation 2000-2. Board Recommendation 2000-2, <i>Configuration Management, Vital Safety Systems</i>, 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 initial reviews of priority facilities and conducted detailed pilot reviews of confinement ventilation systems at two facilities.</p>	
<p>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.</p>	
<p>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, <i>Safety Review of the Hanford Spent Nuclear Fuel Project During the Design and Construction Phase</i>, 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.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

<p>Objective 1-C</p>	<p>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation. The Board and its staff will verify the effective and expeditious development and implementation of DOE's Integrated Safety Management (ISM) program.</p>
<p>Examples of FY 2002 Accomplishments</p>	
<p>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 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. 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.</p>	
<p>Recommendation 2000-2. Board Recommendation 2000-2, <i>Configuration Management, Vital Safety Systems</i>, 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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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 their concerns regarding the structural design margins being used in view of the aggressive design and construction schedule for this project.</p>	
<p>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.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

<p>Objective 1-C:</p>	<p><u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u> The Board and its staff will verify the effective and expeditious development and implementation of DOE's Integrated Safety Management (ISM) Program.</p>
<p>FY 2003 Performance Goals</p>	
<p>The Board and its staff will continue its reviews of DOE's implementation of ISM in design and construction, operation, and post-operation activities, as well as ongoing efforts to make ISM more effective. At least five reviews will be completed. Candidates for review include:</p> <ul style="list-style-type: none"> • Assess the adequacy of DOE's review of Title I/II design, resolution of significant design safety issues, the implementation of quality assurance requirements during facility construction, and the procurement of safety significant facility equipment. Candidate facilities for these activities include the Tritium Extraction Facility and the Pit Disassembly and Conversion Facility at the Savannah River Site, and the High Level Waste Treatment Plant at the Hanford Site. • Activity-level ISM implementation at sites with performance indicators judged to have higher than expected rates of abnormal occurrences related to worker protection. • The quality and effectiveness of at least one ISM review by the DOE Office of Oversight, and the implementation of line oversight of ISM per DOE P 450.5 at one EM site and one NNSA site. • Assess the adequacy and comprehensiveness of root cause determinations of operating events at DOE facilities. Emphasis will be placed on evaluating the prioritization and implementation of the corrective actions with respect to the relative risk significance of the findings which were identified. • Assess the adequacy of the updates to the analysis of the natural phenomenon hazards (e.g., earthquakes, tornados, floods) mandated by DOE Order 420.1, <i>Facility Safety</i>, and associated guides and standards at the Y-12 National Security Complex. • During FY 2003/2004 the Tritium Extraction Facility will be in the construction and procurement phase. Operation of the facility is targeted for FY 2006/2007. The Board's staff will assess the implementation of quality assurance requirements during construction and procurement of safety significant facility equipment and systems. • During FY 2003/2004 the Board's staff will assess the implementation of the DOE-wide <i>Quality Assurance Improvement Plan</i>. <p>As a result of these reviews, DOE will provide an adequate approach and schedule for resolution of identified issues that supports safe start-up and operation of new or modified defense nuclear facilities.</p>	

GOAL 1 — Complex-Wide Health and Safety Issues

Objective 1-C:	<u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u> The Board and its staff will verify the effective and expeditious development and implementation of DOE's Integrated Safety Management (ISM) Program.
FY 2004 Performance Goals	
<p>The Board and its staff will continue its reviews of DOE's implementation of ISM in design and construction, operation, and post-operation activities, as well as ongoing efforts to make ISM more effective. At least five reviews will be completed. Candidates for review include:</p> <ul style="list-style-type: none"> • Evaluate the adequacy of DOE's Title II design of the final proposed Pit Disassembly and Conversion Facility at the Savannah River Site. • During FY 2003/2004 the Tritium Extraction Facility will be in the construction and procurement phase. Operation of the facility is targeted for FY 2006/2007. The Board's staff will assess the implementation of quality assurance requirements during construction and procurement of safety significant facility equipment and systems. • During FY 2003/2004 the Board's staff will assess the implementation of the DOE-wide <i>Quality Assurance Improvement Plan</i>. • Continue design and construction reviews of the Waste Treatment Plant at Hanford and the Highly Enriched Uranium Materials Facility at Y-12. <p>As a result of these reviews, DOE will provide an adequate approach and schedule for resolution of identified issues that supports safe start-up and operation of new or modified defense nuclear facilities.</p>	

**STRATEGIC GOAL 2: SAFE STEWARDSHIP OF NUCLEAR WEAPONS
STOCKPILE AND COMPONENTS**

Continued safe execution of nuclear weapons stockpile support and defense nuclear research activities at DOE's defense nuclear facilities.

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

Strategic Objective 2–A: Safe Conduct of Stockpile Management. The Board and its staff will verify the safety of DOE's defense nuclear facilities and activities relating to the maintenance, storage, and dismantlement of the nuclear weapons stockpile. (See pages D-23 through D-28.)

Strategic Goal 2–B: Safe Conduct of Stockpile Stewardship. The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapons stockpile in the absence of underground nuclear testing. (See pages D-29 through D-34.)

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

Objective 2

Safe Conduct of Stockpile Management. 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.

Examples of FY 1999 Accomplishments

DOE Standard on Hazards Analysis Reports. In early 1999, in response to a Board Recommendation, DOE developed and published a standard on conducting and documenting hazards analyses for nuclear explosive operations. This important directive sets DOE's fundamental expectations and provides guidance on how to establish and document the safety basis that ensures hazardous activities involving nuclear explosives can be completed safely.

Lightning Protection at Pantex. The Board and its staff continued efforts during the last year to help DOE address the potential hazards from lightning to nuclear explosive operations at Pantex. This year, the DOE lightning protection project team (which was established in response to a Board reporting requirement) completed a comprehensive investigation and report detailing the threat of lightning to nuclear explosives, analyzing potential controls and mitigators, and summarizing the actions DOE considers necessary to protect nuclear explosive operations at Pantex from lightning threats. During this same time, DOE has identified and installed many additional lightning protective measures at the plant.

Chemical Safety. Based on evaluations from its staff, the Board concluded that efforts to improve chemical safety at the Oak Ridge Y-12 Plant were not keeping pace with other defense nuclear sites or the Secretary of Energy's published expectations. After the Board communicated its concern, DOE stepped up efforts to complete a chemical management program at Oak Ridge Y-12, including a renewed commitment to characterize chemical inventories for emergency planning purposes and to dispose of excess chemicals.

Safety Controls for Specific Nuclear Explosive Operations. The Board and its staff conducted numerous assessments of the safety of specific nuclear explosive activities at the Pantex Plant in the last year. These reviews, which included the W56 dismantlement, the W87 Life Extension Program, and the W62 surveillance program, identified safety-related issues such as the adequacy of safety analyses and controls, the flowdown of controls into operating-level procedures, and the readiness of activities to operate safely. As a result of the Board's involvement, DOE has taken positive action to improve the safety of all of these operations.

Integrated Safety Management at Pantex. In early FY 1999, the Board issued Recommendation 98-2, *Integrated Safety Management at the Pantex Plant*, urging DOE to take fundamental actions to improve the safety of all weapons-related work at the Pantex Plant. Principle among the Board's specific recommendations was that DOE simplify and expedite its process for re-engineering processes at Pantex such that the attendant safety improvements could be put in place sooner. DOE accepted Recommendation 98-2 and made specific commitments to improve safety management at Pantex including accelerating efforts to establish weapon-specific safety basis for all on-going activities at Pantex.

Enriched Uranium Restart at Y-12. The Board and its staff evaluated DOE efforts to resume enriched uranium operations at the Oak Ridge Y-12 Plant. In the last year, the Board identified to DOE several safety issues with the Phase A2 resumption project including design problems, safety analysis problems, and problems with implementation of safety controls. The Board and DOE worked cooperatively to resolve these issues such that Phase A2 operations could resume safely to support high priority national defense related missions.

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

Objective 2

Safe Conduct of Stockpile Management. 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.

Examples of FY 2000 Accomplishments

Pit Storage and Repackaging. Currently, the vast majority of plutonium pits at the Pantex Plant are in inadequate storage configurations. In response to the Board's Recommendation 99-1, *Safe Storage of Fissionable Material called "Pits,"* DOE has started a major effort to repackage all pits into improved storage containers and execute a surveillance plan to ensure that pits in storage remain in a safe environment.

Y-12 Plant Safety Basis. As a result of staff reviews and several letters from the Board, personnel at the Y-12 Plant have revised the implementation plan for upgrades to the safety bases for their nuclear facilities. This upgrade program will lead to better identification of hazards and necessary controls for prevention and mitigation of potential accidents. This effort will also lead to implementation of the intent of an Integrated Safety Management program at the related facilities in a more effective manner.

W62 Disassembly and Inspection Restart. As a result of the Board's and its staff's focused involvement in the reauthorization of Disassembly and Inspection (D&I) operations for the W62 nuclear warhead, DOE improved safety of the operation by upgrading the tooling and procedures used for the job. This effort, which was prompted by the Board's Recommendation 98-2, *Integrated Safety Management at the Pantex Plant*, also resulted in a substantial improvement in the technical rigor and thoroughness of the Nuclear Explosive Safety Study Revalidation process. In addition, the experience that DOE and its contractors gained during this effort resulted in an improved process for hazards analysis at Pantex for other nuclear explosive operations, and the execution of that process improved noticeably as a result of the progress made during the W62 D&I restart activities.

Pantex Fire Protection. The Board and its staff highlighted to DOE senior management that the fire detection system at Pantex was failing because the commercial vendor had stopped producing spare parts. The review also identified that the fire suppression capability of the cells in one Building lagged behind that in other nuclear explosive operating facilities because they did not have ultra-violet detectors to initiate suppression. As a result of the Board's actions, a major part of the supplemental appropriation from DOE to Pantex will be used to install a UV detection system to activate the deluge system in the cells, greatly improving the fire safety of explosive operations in the area. Additionally, DOE has started plans (in response to Recommendation 98-2) to accelerate replacement of the fire detection system with a non-proprietary system supported by many different commercial vendors.

Canned Subassemblies. Comparing safety analyses from the Pantex Plant and Y-12 Plant, the Board's staff noted that the analyses at Pantex did not consider the potential damage resulting from exposure of canned subassemblies (CSAs – the fusion portion of a nuclear weapon) to fires. Further research by the staff on the properties of the materials making up some CSAs indicated a significant hazard at Pantex that was not considered by the site or the Design Agency. Working with safety basis and other engineering personnel from all three sites, the staff assisted in the development of a predictive model of behavior for these components. Controls were subsequently enhanced to ensure that they were adequate to protect the CSAs.

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

Objective 2-A:	Safe Conduct of Stockpile Management. The Board and its staff will verify the safety of DOE's defense nuclear facilities and activities relating to the maintenance, storage, and dismantlement of the nuclear weapon stockpile.
Examples of FY 2001 Accomplishments	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>Recommendation 99-1. In response to Board Recommendation 99-1, <i>Safe Storage of Fissionable Material called "Pits."</i> 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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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, <i>Integrated Safety Management at the Pantex Plant</i>. 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.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

Objective 2-A:

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

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 three dozen 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 and re-evaluated the safety basis, and is considering installation of a fixed fire suppression system to protect the structure and its workers.

Maintenance Improvement Program at Y-12. In 2001, Y-12 responded to Board concerns that overdue and deferred maintenance was undermining the effectiveness and reliability of safety systems by implementing a maintenance improvement program. In continuing to pursue this issue, 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 highly enriched 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.

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. As a result, all active nuclear explosive operating procedures are being revised to be easier to follow and more accurate, place keeping within procedures has been enhanced, a new emphasis has been placed on procedural adherence by plant management, and procedural adherence occurrences now receive more attention from both NNSA and Pantex Plant management.

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.

Building 12-64 Seismic Analysis at Pantex. In 1998, the Board wrote DOE, expressing concern with the seismic response of Building 12-64. In April 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 to the issue are underway.

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

Objective 2-A

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

FY 2003 Performance Goals

The Board and its staff will conduct at least thirteen 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, and SRS tritium facilities and possibly stockpile management activities at Los Alamos National Laboratory.

Candidate areas for Board and staff review include:

- Site-wide and facility-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., safety analysis reports developed in response to 10 CFR 830).
- Weapon-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., the W62 and the W78).
- Start-up of highly enriched uranium processing activities at the Y-12 National Security Complex (e.g., secondary extraction).
- Nuclear Explosive operations at Pantex (e.g., the W62, special purpose facilities, and on-site transportation).
- Cross-cutting functional areas at the Pantex Plant, Y-12 National Security Complex, or SRS tritium facilities (nuclear criticality safety, fire protection, nuclear explosive safety).
- Special studies of unique or significant hazards at a DOE weapons facilities (e.g., process technology alternatives).

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 2003.

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components**Objective 2-A**

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

FY 2004 Performance Goals


The Board and its staff will conduct at least thirteen 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, and SRS tritium facilities and possibly stockpile management activities at Los Alamos National Laboratory.

Candidate areas for Board and staff review include:


- Site-wide and facility-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., safety analysis reports exempted or deferred as part of the response to 10 CFR 830).
- Weapon-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., the W78 and the B83).
- Start-up of enriched uranium operations, hydrogen fluoride systems, and other similar processing activities at the Y-12 National Security Complex.
- Nuclear Explosive operations at Pantex (e.g., conventional high explosive programs such as the W78 and the W88, insensitive high explosive programs such as the B83 and the W87.)
- Cross-cutting functional areas at the Pantex Plant, Y-12 National Security Complex, or SRS tritium facilities (nuclear criticality safety, fire protection, nuclear explosive safety).
- Special studies of unique or significant hazards at DOE weapons facilities (e.g., process technology alternatives).

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 2004.

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

	<p>Objective 2-B: <u>Safe Conduct of Stockpile Stewardship.</u> The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.</p>
Examples of FY 1999 Accomplishments	
<p>B332 Restart. After a Board letter in December 1997 identifying weaknesses in work planning, authorization and control in Building 332, Plutonium Facility, the Board interacted with Lawrence Livermore National Laboratory and the Department of Energy throughout Building 332's Resumption of Operations in 1998 and 1999 to encourage and assist with the improvements. As a result, Building 332 implemented a process to plan, authorize and control work with special nuclear material safely. With the Board's encouragement the process has been applied to the other facilities in the Superblock, i.e., Tritium Facility and Hardened Engineering Test Building. The Laboratory is revising site implementing guidance on planning, authorizing and control work to address a laboratory-wide systemic problem.</p>	
<p>Integrated Safety Management at LLNL. As a result of the Board's effort to improve safety management at DOE defense nuclear facilities (Recommendation 95-2), LLNL developed a set of Work Smart Standards (a set of requirements and standards for hazards specifically applicable to LLNL), is making significant progress with developing a description of its integrated safety management system, and is developing site-wide standards/guidance to implement an integrated safety management system. Through direct Board interaction, Board letters, and Board staff visits and reviews, the Board has provided assistance with developing the Work Smart Standards and to the Laboratory's efforts to develop policy and guidance to implement integrated safety management.</p>	
<p>Y2K. Based on staff reviews at Lawrence Livermore National Laboratory and other sites, the Board determined the DOE had provided inadequate direction to the operators of its defense nuclear facilities with regard to evaluating safety-related systems for year 2000 compliance. The Board communicated its concern to DOE in a letter requesting that DOE report on the status of safety-related equipment evaluations at all defense nuclear facilities. In April 1999, DOE issued detailed guidance on the evaluation of safety-related systems, requiring those systems be treated in a manner similar to mission-essential systems.</p>	
<p>Los Alamos National Laboratory Pajarito Laboratory. The Board and its staff identified deficiencies with the safety basis for activities conducted at the Pajarito Laboratory (also known as TA-18). The Board assisted DOE and the lab in defining a path to improve the safety basis including urging that DOE focus on Basis for Interim Operations to upgrade the safety controls at Pajarito Laboratory as soon as possible.</p>	
<p>Damaged Nuclear Weapons. The Board has recently focused attention on the issue that DOE's capability to safely perform the work necessary to dispose of damaged nuclear devices (DNDs) at defense nuclear facilities is rapidly disappearing. In the past, maintenance of the facilities and personnel necessary to support this mission depended on nuclear test operations. However, the personnel and facility infrastructure that were required to support testing operations are rapidly disappearing. Planning DND operations so that they can be executed safely represents challenges that DOE is not addressing. DOE has agreed with the Board's conclusions and is starting to increase its efforts to address this issue.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

	<p>Safe Conduct of Stockpile Stewardship. The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.</p>
<p>Examples of FY 2000 Accomplishments</p>	
<p>LLNL Electrical and I&C. Based on reviews by the Board's staff of LLNL's electrical, instrumentation, and control systems, the Board concluded that the safety-class emergency power system at LLNL's plutonium facility (Building 332) was neither designed nor maintained to safety-class standards. The staff report also noted potential areas for improvement, particularly LLNL's Work Smart Standards for safety-related instrumentation and control systems and lightning protection for Building 332. In response, LLNL took prompt actions to address the Board's issues such as correcting improper seismic mounts for safety-critical electrical components and switchgear.</p>	
<p>LANL Authorization Basis (AB) Documents. The Board noted significant deficiencies in the quality of some AB documents at LANL and urged DOE and the laboratory to take decisive corrective actions. As a result of highlighting these issues, LANL, under strong guidance from LAAO, performed a thorough self-assessment of the quality of AB documentation. LANL found that the documentation for most of the facilities reviewed had significant deficiencies. LANL, under guidance from LAAO, agreed contractually to upgrade the quality of the documentation involved. LANL has also reorganized to improve its ability to assure the quality of ABs.</p>	
<p>LANL Response to Cerro Grande Fire and Potential for Flooding. After firefighters began to control the Cerro Grande fire, the Board conducted on-site reviews of the status of defense nuclear facilities and LANL's facility recovery plans. The defense nuclear facilities incurred little or no significant damage, and facility recovery plans were found to be thorough. The Board also reviewed the potential for flooding as a result of the loss of the ability of soil to absorb water. LANL responded swiftly to the threat of flooding with flood control and mitigation measures. The Board, however, identified important areas where DOE needed to be more thoroughly engaged in reviewing the adequacy and appropriateness of measures being taken immediately and in the future to address flooding concerns.</p>	
<p>LLNL Safety Basis Improvement. Extensive Board and staff reviews of LLNL's authorization basis for defense nuclear facilities have focused the Oakland Operations Office's attention towards nuclear safety and enhanced technical competence and the degree of involvement in the safety basis at LLNL. In response to the Board's reviews, there has been a substantial and continuing improvement of the LLNL Safety Basis program, including improvements in technical competence, training, and quality of safety basis documents.</p>	
<p>Readiness to Dispose of a Damaged Nuclear Weapon at the Nevada Test Site. The Board highlighted to DOE that there are 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, DOE has developed a project to upgrade its capabilities to conduct these activities safely. DOE has conducted a number of exercises that clearly identified issues needing to be addressed. The drills and exercises have already improved DOE's proficiency in this important mission area. With the Board's continued oversight DOE is now prioritizing its infrastructure upgrade needs.</p>	
<p>LANL Classified Experiment. Board interactions with LANL have led to the formation of a group of experts to thoroughly review a classified experiment with potentially significant safety consequences and are significantly improving the quality of safety controls. The expert panel has been conscientiously evaluating the complicated activity and has identified numerous improvements that LANL has implemented (or is working on) that substantially improve the safety of this experiment and the design and safety basis for similar experiments potentially conducted in the future.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

Objective 2-B:

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

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.

Lightning Detection and Warning at LANL. The Board's 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.

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.

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.

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

Objective 2-B:	Safe Conduct of Stockpile Stewardship. The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.
Examples of FY 2002 Accomplishments	
<p>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.</p>	
<p>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 to resolve this issue.</p>	
<p>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.</p>	
<p>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 piece-meal, 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, <i>Life Cycle Asset Management</i>, 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.</p>	
<p>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 submitted a report presenting additional deficiencies with the lightning protection systems at various facilities at LANL. LANL personnel are working to address these issues.</p>	
<p>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.</p>	
<p>Sandia Underground Reactor Facility (SURF). In March, 2002, the Board identified concerns with the preliminary classification of controls at SUR—particularly the confinement system boundaries and requirements. DOE responded with a plan to address these concerns in the Preliminary Safety Analysis Report and design effort for the project, such that final disposition of the issues will be addressed in the Critical Decision-3 (CD-3), preceding the start of construction.</p>	
<p>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 emergency operations capability, and it is being implemented.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

Objective 2-B	<u>Safe Conduct of Stockpile Stewardship.</u> The Board and its staff will verify the safety of DOE's defense nuclear activities undertaken to ensure the continuing effectiveness of the nuclear weapon stockpile in the absence of underground nuclear testing.
FY 2003 Performance Goals	
<p>The Board and its staff will conduct at least seven assessments of DOE's efforts to develop and implement safety management systems for stockpile stewardship activities. The Board will also cover DOE's efforts to address safety issues of aging-related changes in nuclear weapons components, including research and modeling, for weapon systems and components in the enduring stockpile. These reviews will focus on activities at LLNL, LANL, NTS, and SNL. Candidate areas for Board and staff review include:</p> <ul style="list-style-type: none"> • Site-wide and facility-specific safety analyses and controls identification and implementation for defense nuclear activities or facilities (e.g., safety analysis reports developed in response to 10 CFR 830). • 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. • Design and construction of defense nuclear facilities e.g., relocation of the TA-18 mission (the Los Alamos Critical Experiments Facility) and the Sandia Underground Reactor Facility. • Aging-related changes in nuclear weapons components for weapon systems in the enduring stockpile. • Safety controls selected for hazardous weapons complex activities. • Cross-cutting functional areas at LANL, LLNL, NTS, and SNL. <p>While performing the above reviews, the Board and its staff will assess the effectiveness of ISM implementation for proposed and on-going operations.</p>	

GOAL 2 — Safe Stewardship of Nuclear Weapons Stockpile and Components

Objective 2-B:

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

FY 2004 Performance Goals

The Board and its staff will conduct at least seven assessments of DOE's efforts to develop and implement safety management systems for stockpile stewardship activities. The Board will also cover DOE's efforts to address safety issues of aging-related changes in nuclear weapons components, including research and modeling, for weapon systems and components in the enduring stockpile. These reviews will focus on activities at LLNL, LANL, NTS, and SNL. Candidate areas for Board and staff review include:

- Site-wide and facility-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., safety analysis reports exempted or deferred as part of the response to 10 CFR 830).
- Work-planning process e.g., activity-specific hazard analysis, controls identification and design, 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.
- Design and construction of defense nuclear facilities (e.g., relocation of the TA-18 mission (the Los Alamos Critical Experiments Facility) and the Sandia Underground Reactor Facility).
- Aging-related changes in nuclear weapons components for weapon systems in the enduring stockpile.
- Safety controls selected for hazardous weapons complex activities.
- Cross-cutting functional areas at LANL, LLNL, NTS, and SNL.

While performing the above reviews, the Board and its staff will assess the effectiveness of ISM implementation for proposed and on-going operations.

**STRATEGIC GOAL 3: SAFE DISPOSITION OF HAZARDOUS
REMNANTS OF WEAPONS PRODUCTION**

Safe and effective characterization, stabilization, and storage of hazardous remnants of nuclear weapons production and decommissioning of legacy facilities in a manner that protects the worker, the public, and the environment.

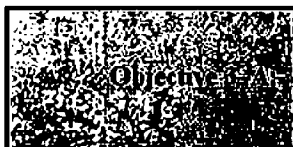
Safe and effective characterization, stabilization, and storage of hazardous remnants of nuclear weapons production and decommissioning of legacy facilities in a manner that protects the worker, the public, and the environment.

The objectives and annual performance goals in support of the Board's third goal address the Board's efforts to confirm the safe disposition of hazardous nuclear weapons legacy materials and facilities. Achieving this goal requires a multi-year, multi-focus, multi-site effort during each annual performance period. The two strategic objectives that support the general goal address DOE's efforts to reduce the risks of legacy materials by appropriate processing and disposition, as well as efforts to decommission production facilities and sites no longer essential to the national security mission.

Strategic Objective 3-A: Material Stabilization. The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal, as needed. (See pages D-36 through D-41.)

Strategic Objective 3-B: Facility Decommissioning. The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public. (See pages D-42 through D-47.)

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

	<p>Material Stabilization. The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal, as needed.</p>
<p>Examples of FY 1999 Accomplishments</p>	
<p>Improved Remediation Schedules for Legacy Materials. In December 1998, after numerous formal and direct interactions with the Board and its staff, DOE issued an up-to-date plan and schedule for addressing the numerous health and safety risks posed by the highest priority legacy materials stored throughout the DOE nuclear weapons complex, originally identified by the Board in Recommendation 94-1. However, the Board identified several deficiencies in the new plan, and soon thereafter discovered that site-level planning did not support several significant commitments. The Board has engaged DOE on these issues, and will see that they are resolved expeditiously.</p>	
<p>Operational Problems at Savannah River Site. In the spring of 1999, the Board's continuing review of operational data for DOE defense nuclear facilities revealed a negative trend in control of work and operations at the Savannah River Site. The Board issued a letter to DOE in May 1999 identifying this problem to DOE, stating that a broader look at the underlying causes and a systematic understanding of those causes would be required to correct weaknesses in performance. In response, DOE has undertaken corrective actions to reverse this trend and ensure a sustained, highly satisfactory level of performance.</p>	
<p>Completion of Recommendation 94-3 at Rocky Flats. The Board issued Recommendation 94-3, <i>Rocky Flats Plutonium Storage</i>, to ensure that the large quantity of plutonium at the Rocky Flats Environmental Technology Site would be safely stored. The Board recommended that DOE take a systematic approach to evaluating the suitability of Building 371 for the proposed new mission of storing the site's entire plutonium inventory, and prepare a program plan for building upgrades and improvements consistent with the building's mission. As a result of the Board's recommendation, upgrades to the building's structure, systems, and components, as well as the safety basis, were completed during Fiscal Year 1999. The Board closed this recommendation and now considers the building adequate for its current storage mission.</p>	
<p>Characterization and Safety of Hanford High-Level Waste Tanks. The Board and its staff have continued to press DOE to resolve the health and safety issues presented by the 177 high-level waste tanks at Hanford. In 1999, the Board worked closely with DOE to develop a strategy for resolving the remaining safety-related uncertainties in the characterization of the wastes, and to ensure that DOE developed a sound strategy for mitigating flammable gas retention problems in Tank 241-SY-101. Because of these efforts, Board Recommendation 93-5, dealing with Hanford high-level waste characterization, is expected to be closed shortly, and the Board expects that DOE will be able to resolve the Tank 241-SY-101 problem in FY 2000.</p>	

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

Objective 3-4:

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

Examples of FY 2000 Accomplishments

Improved Remediation Schedules for Legacy Materials. On January 4, 2000, the Board issued Recommendation 2000-1 to ensure that the stabilization of legacy materials continues in a manner that reflects the risks posed by the materials. Additionally, the Board recommended that funding shortfalls preventing timely stabilization of materials be identified and reported as required by law. On June 8, 2000, DOE submitted a revised implementation plan intended to satisfy both Recommendation 94-1 and 2000-1. According to the plan the vast majority of remaining material will be stabilized within the next several years. Outstanding issues relating to material stabilization were communicated to DOE in a letter dated July 14, 2000.

In accordance with the Implementation Plan for Board Recommendation 94-1 and the US District Court of Idaho Court Order, all spent nuclear fuel was removed from the unlined basins at the Idaho National Engineering and Environmental Laboratory CPP-603 Fuel Receiving and Storage Building to a newer fuel storage facility (CPP-666) by April 28, 2000. Transfer of the fuel reduces the risk of leakage of radioactive materials from deteriorating spent fuel in unlined basins and is the first step towards drying and encapsulation of the spent fuel in dry storage facilities for the longer-term.

Standards for Safe Storage of Fissile Materials. In July 2000, DOE issued a standard for stabilization and packaging of uranium-233 metals and oxides for safe long-term storage. This standard was developed in response to Board Recommendation 97-1, with the Board working closely with DOE during its development to ensure that it contained appropriate requirements for safely storing this highly radioactive isotope. The Board also continued to assist DOE in refining a similar standard for safe packaging and storage of plutonium, which had been finalized and issued in response to Board Recommendation 94-1. In early 2000, after extensive review and discussions with DOE, the Board agreed to modifications to the plutonium standard that would make it easier to implement without compromising safety.

Engineered Safety Controls. In several reviews of new operations at the Savannah River Site, the Board identified inadequacies in the use of engineered controls to prevent potential accidents. As a result, improved controls were implemented for high-level waste retrieval activities. The Board is pursuing similar improvements in the design of the equipment for pretreatment and vitrification of highly radioactive americium/curium solutions at Savannah River. The Board is continuing to press DOE to address the root cause of these problems, and to reaffirm the importance of avoiding an undue reliance on administrative controls and non-safety-grade equipment.

Implementation of Radioactive Waste Management Order. In response to Board Recommendation 94-2, DOE has revised and reissued its radioactive waste management order, Order 435.1, to provide more comprehensive and effective requirements. The Board discovered this year that DOE had informed the operating contractor at Rocky Flats that several key provisions of the order did not apply to Rocky Flats on the grounds that it was not considered an operating facility. The Board acted immediately to correct this problem, ultimately issuing formal correspondence that led DOE to reverse this inappropriate interpretation before it spread to other sites.

Safe Storage of High-Level Waste. In June 2000, the Board's staff completed a review of high-level waste tank systems at the Hanford Site. Several significant issues were identified related to preserving the integrity of the storage tanks, notably the need to promptly correct the chemistry in tanks that had become depleted of corrosion inhibitors, the need to ensure the operability of ventilation systems required to prevent moisture from forming between the walls

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

Objective 3-A:

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

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 worsen with time. 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 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 towards 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, fulfilling another commitment responding 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.

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

<p>Objective 3-A:</p>	<p>Material Stabilization. The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal, as needed.</p>
<p>Examples of FY 2002 Accomplishments</p>	

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 time. 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. Also this year, 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.

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.

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

	<p>Material Stabilization. The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal, as needed.</p>
FY 2003 Performance Goals	
<p>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:</p> <ul style="list-style-type: none"> • Stabilization, packaging, and storage of plutonium metal and oxide at Hanford and LANL (Recommendation 94-1/2000-1). • Design of facilities for stabilization and packaging of plutonium metal and oxide at Savannah River (Recommendation 94-1/2000-1). • Stabilization and disposal of plutonium-bearing solutions and residues at Savannah River and LANL (Recommendation 94-1/2000-1). • Preparations for neptunium solutions stabilization at Savannah River (Recommendation 94-1/2000-1). • Pretreatment and disposition of americium/curium solutions at Savannah River (Recommendation 94-1/2000-1). • Characterization, stabilization, and packaging of uranium-233 (^{233}U) materials at Oak Ridge (Recommendation 97-1), as well as planning and preparations for processing of ^{233}U for potential medical applications. • Stabilization and disposition of highly-enriched uranium solutions at Savannah River (Recommendation 94-1/2000-1). • Design of the treatment facility for high-level waste liquids and salts at the Savannah River Site, and system improvements to ensure safe management of the Savannah River Site high-level waste (Recommendation 2001-1). • Design of facilities for treatment of high-level waste, and testing and operation of high-level waste retrieval and transfer systems at Hanford. • Design, construction and start-up of the Melton Valley transuranic/alpha waste treatment facility at ORNL. • Safety of spent nuclear fuel and sludge retrieval, treatment, and storage at Hanford (Recommendation 94-1/2000-1). • Safety of full throughput contact-handled transuranic waste operations at WIPP, and preparations for initial remote-handled transuranic waste operations at WIPP. • Complex-wide legacy nuclear material issues, including evaluation of materials not addressed in Recommendations 94-1, 97-1, and 2000-1. 	

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

Objective 3-A

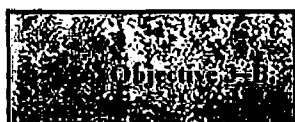
Material Stabilization. The Board and its staff will verify that DOE properly characterizes, stabilizes, processes, and safely stores surplus plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, and that DOE provides for expeditious disposal, as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

FY 2004 Performance Goals

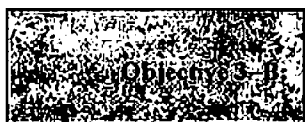
The Board and its staff will conduct assessments of DOE's efforts to characterize, stabilize, process, and safely store plutonium, uranium, and other actinides, residues, spent fuel, and wastes from the nuclear weapons program, to ensure that these efforts are performed safely and that the risks posed 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 Savannah River and LANL (Recommendation 94-1/2000-1).
- Stabilization and disposal of plutonium-bearing solutions and residues at Savannah River and LANL (Recommendation 94-1/2000-1).
- Design of potential modifications to existing Savannah River processing facilities to support plutonium disposition activities.
- Preparations for neptunium solutions stabilization at Savannah River (Recommendation 94-1/2000-1).
- Characterization, stabilization, and packaging of uranium-233 (^{233}U) materials at Oak Ridge (Recommendation 97-1).
- Stabilization and disposition of highly-enriched uranium solutions at Savannah River (Recommendation 94-1/2000-1).
- Design of the treatment facility for high-level waste liquids and salts at Savannah River, and system improvements to ensure safe management of the Savannah River high-level waste (Recommendation 2001-1).
- Design of facilities for treatment of high-level waste, and testing and operation of high-level waste retrieval and transfer systems at Hanford.
- Start-up and initial operations of the Melton Valley transuranic/alpha waste treatment facility at ORNL.
- Safety of spent nuclear fuel and sludge retrieval, treatment, and storage at Hanford (Recommendation 94-1/2000-1).
- Safety of full throughput contact-handled and remote-handled transuranic waste operations at WIPP.
- 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.

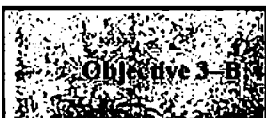
GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

	<p>Facility Decommissioning: The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.</p>
<p>Examples of FY 1999 Accomplishments</p>	
<p>Upgraded Safety Controls for Decommissioning at Rocky Flats. Decommissioning activities are being conducted in several buildings at the Rocky Flats Environmental Technology Site. The Board identified that safety controls for protection of workers did not provide the desired level of protection because of an inappropriate reliance on personal protective equipment (e.g., respirators) rather than engineered controls to eliminate or mitigate hazards. Furthermore, when engineered controls were used (e.g., air movers), they were not adequately analyzed to ensure that they produced the desired result. In response to these concerns, a multi-disciplinary team was chartered at RFETS to develop more rigorous engineered controls and analyze performance of the controls. Enhanced worker protection controls are now being applied to demolition of contaminated equipment at the site. RFETS is also investigating the use of remote equipment for size reduction of contaminated equipment.</p>	
<p>Activity Level ISM of Hanford Decommissioning Work. The Board's staff reviewed planning and implementation of decommissioning work being done by the Hanford Environmental Restoration Contractor. The staff found that the work control procedures and practices need improvement to meet the intent of Integrated Safety Management. 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. Some areas of needed improvement have been communicated directly to DOE.</p>	
<p>Radiation Protection Measures for Metal Tritides during Decommissioning. During FY 1999, the Board's staff evaluated radiation protection program measures for decommissioning work in areas at the Miamisburg Environmental Management Project (MEMP) that are suspected of being contaminated with tritium compounds such as metal tritides. As a result of staff visits and subsequent information exchanges, the MEMP contractor prepared a corrective action plan to address deficiencies in the radiation protection program, and work is proceeding to resolve these issues before major decommissioning work begins in mid-September 1999. These technical issues also apply to other defense nuclear facilities, so the Board has requested that DOE articulate a technical position on this matter to ensure that appropriate measures are implemented across the defense nuclear facilities complex. As a result of this action, DOE-EM informed DOE Field Offices of the issue, drafted a technical position regarding control levels for airborne radioactivity, and has committed to developing an updated technical approach.</p>	

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

	<p>Facility Decommissioning: The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.</p>
Examples of FY 2000 Accomplishments	
<p>Efforts to Improve Decommissioning Work at the Hanford 233-S Facility. The Board's staff has monitored the planning and accomplishment of decommissioning work at the Hanford 233-S Plutonium Concentration Facility. Board correspondence and staff comments to DOE and its contractor regarding this facility have focused on work planning and implementation deficiencies. Safety deficiencies involving the work site and Process Hood glove bags noted by the staff have been discussed with project personnel, and corrective actions were taken to resolve some concerns. The staff has noted that efforts are being made to improve work planning and implementation. For example, the contractor held a workshop to review the radiological work planning process and provide recommendations for improvement, and a contractor project manager requested that a team of contractor and DOE health physicists inspect glove bags used in Process Hood decommissioning work.</p>	
<p>Upgraded Work Controls for Decommissioning at Rocky Flats. The Board has followed dismantlement work activities for gloveboxes and other equipment in Building 771 (the former Plutonium Recovery Facility) at the Rocky Flats Environmental Technology Site (RFETS) and has issued correspondence noting problems with work planning and control. The staff reviewed the implementation of the RFETS Integrated Work Control Program (IWCP) and provided comments to RFETS personnel. The contractor revised the IWCP manual and has taken steps to improve the implementation of the program. This action has contributed to addressing the staff's observations of deficient implementation of the hazard analysis process for deactivation and decommissioning activities in facilities such as Building 771.</p>	
<p>Upgraded Safety Controls for Decommissioning Work at Rocky Flats. The Board's staff has followed RFETS' efforts to apply engineered controls for size reduction of gloveboxes and other equipment in response to comments provided by the Board. These controls will help remove or greatly reduce the radioactive airborne environment. The staff has continued to communicate the need to mitigate or eliminate hazards by the use of engineered controls, and RFETS personnel are actively pursuing a phased approach of design, testing, and implementation of engineered controls in support of their site closure work.</p>	
<p>New and Revised Procedures for Decommissioning Work at the Miamisburg Environmental Management Project. The Board's staff reviewed and provided comments regarding a draft technical basis document, new and revised implementing procedures, and plans for determining readiness for decommissioning work involving special tritiated compounds at the Miamisburg Environmental Management Project (MEMP). These comments contributed to improving the documents. Various work control documents have been reviewed, and staff comments have been provided to DOE-MEMP and the contractor. Staff-to-staff discussion is expected to help better identify and resolve deficiencies.</p>	

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production



Objective 3-B

Facility Decommissioning. The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.

Examples of FY 2001 Accomplishments

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 on-site 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 finds 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 are proceeding toward an Operational Readiness Review before the end of 2001.

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.

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.

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

Objective 3-B

Facility Decommissioning. The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.

Examples of FY 2002 Accomplishments

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.

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.

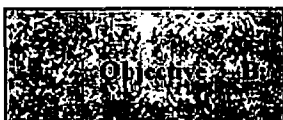
An increasing amount of decommissioning work at Rocky Flats is planned to be done by subcontractors and other personnel not directly attached to the major D&D projects. The Board observed that actions planned by DOE and its contractor to address past problems with this approach did not clearly address 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. On-site 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.

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.

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, which ought to improve the work flow and the safety of maintenance activities.

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production


Facility Decommissioning. The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.

FY 2003 Performance Goals

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

- Building 371, 707, or 776/777 at Rocky Flats.
- Decommissioning at Miamisburg Environmental Management Project.
- Decommissioning at Fernald Environmental Management Project.
- Decommissioning at Los Alamos National Laboratory.
- CPP-603 spent fuel basin at INEEL.
- Heavy Element Facility (Building 251) at LLNL.

GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production

	<p>Facility Decommissioning. The Board and its staff will verify that DOE aggressively pursues the safe decommissioning of excess defense nuclear facilities that pose a significant risk to the workers or the public.</p>
FY 2004 Performance Goals	
<p>The Board and its staff will conduct assessments of the adequacy of plans, standards, procedures, and execution for activities associated with decommissioning of DOE defense nuclear facilities. These assessments will be conducted using the principles of Integrated Safety Management to ensure that decommissioning efforts are performed safely. Additionally, the Board and its staff will continue efforts to confirm that high-risk facilities are decommissioned in a timely manner. These assessments are conducted in collaboration with State and other regulatory authorities, as needed, and on a schedule that supports DOE's operational plans. Representative areas for Board and staff review include:</p> <ul style="list-style-type: none"> • Building 371 at Rocky Flats. • Savannah River Site deactivation activities, including F-Canyon and M-Area facilities. • Hanford decommissioning activities, including the Plutonium Finishing Plant. • Decommissioning at Miamisburg Environmental Management Project. • Decommissioning at Fernald Environmental Management Project. • Heavy Element Facility (Building 251) at LLNL. 	

FY 2005 BUDGET REQUEST TO THE CONGRESS

Defense Nuclear Facilities Safety Board



February 2004

**Defense Nuclear Facilities
Safety Board
FY 2005 Congressional Budget Request**

APPROPRIATION & EXPENSE SUMMARY

(Tabular dollars in thousands.)

OPERATING EXPENSES

	ACTUAL FOR <u>FY 2003</u>	PROJECTED FOR <u>FY 2004</u>	BUDGET REQUEST FOR <u>FY 2005</u>
New Budget Authority	18,876*	19,444**	20,268
Obligations	19,957	20,804	21,386
Outlays	19,605	20,388	20,958

* \$19,000,000 appropriation; \$123,500 rescission.

** \$19,559.000 appropriation; \$115,398 rescission.

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).

**Defense Nuclear Facilities
Safety Board
FY 2005 Congressional Budget Request**

PERSONNEL SUMMARY

	<u>FY 2003 ACTUAL</u>	<u>FY 2004 FINANCIAL PLAN</u>	<u>FY 2005 BUDGET REQUEST</u>
Statutory Personnel Ceiling: (FTE's) ^{1/}	150	150	150
FTE Usage ^{2/}	96	100	100
<hr/>			
Board Members & Permanent Employees at End of Fiscal Year	98	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.

**Defense Nuclear Facilities
Safety Board
FY 2005 Congressional Budget Request**

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, \$20,268,000 to remain available until expended. [*Energy and Water Development Appropriations Act, 2004*]

**Defense Nuclear Facilities
Safety Board
FY 2005 Congressional Budget Request**

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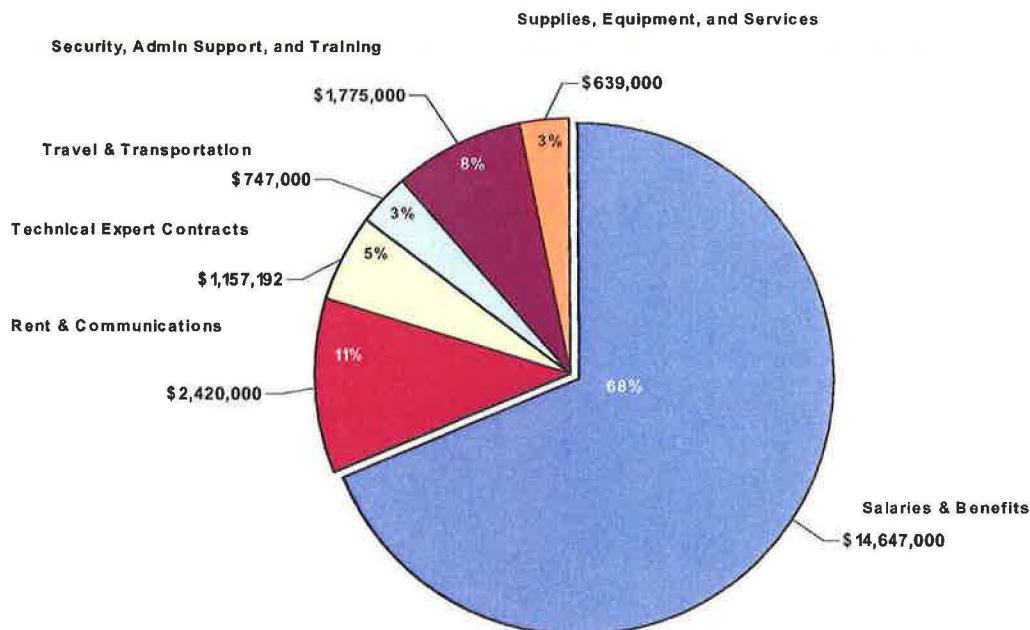
**Defense Nuclear Facilities
Safety Board
FY 2005 Congressional Budget Request**

1. EXECUTIVE SUMMARY

The Defense Nuclear Facilities Safety Board's (Board) FY 2005 Performance Based Budget Request is for \$20.268 million in new budget authority and 100 full-time equivalent (FTE) staff years.

As shown on the graph below, the Board's budget is used primarily to pay the salaries and benefits of its employees, with most of the remaining resources dedicated to supporting those employees, thus limiting the Board's ability to absorb unfunded non-discretionary pay increases from other areas of the budget.

FY 2005 Total Projected Obligations = \$21,386,000



The Board was established by Congress in 1988 to provide independent, expert-based safety oversight of the defense nuclear weapons complex operated by the Department of Energy (DOE). This budget request highlights many of the changes that are occurring or are planned for the weapons complex, and the corresponding health and safety oversight challenges that the Board must address to effectively fulfill its statutory oversight mission. The fact that the nuclear weapons program remains a technically challenging and hazardous operation cannot be overemphasized. DOE must maintain readiness of the nuclear arsenal, dismantle surplus weapons, dispose of excess radioactive materials, clean up surplus defense facilities, and construct new facilities – all in a manner that protects the public, the workers, and the environment.

As envisioned by the enabling statute and accompanying report language, the value of the Board's contribution in assuring public health and safety and the continued viability of DOE's nuclear weapons and cleanup missions has been significant. This document contains many examples of where and how the Board has identified health and safety issues and taken deliberate action to help the Secretary of Energy correct the problems. That contribution is based on the technical expertise of five full-time Board Members, the staff, and constant oversight by the Board's field site representatives during the past 14 years. A fundamental tenet of good safety for high-hazard, complex operations, such as the Department's nuclear weapons program, is independent oversight based on solid engineering judgment. The Board supplies that independent, expert-based oversight.

Accomplishing the Board's oversight plans and performance objectives as presented in this budget request are not without challenges. For example, DOE's National Nuclear Security Administration (NNSA) is implementing a strategic plan that is changing the balance and location of nuclear weapons efforts throughout the defense nuclear complex. Tritium extraction for stockpile use, conduct of nuclear experimentation, and preservation of the strategic plutonium pit inventory, will require new defense nuclear operations. As this strategy continues to unfold, some sites (such as the Lawrence Livermore National Laboratory and the Nevada Test Site) will experience significantly increased program activity.

The Board's oversight effort also must keep pace with the significant increase in new defense nuclear facilities in the design and construction phase. DOE has more than 20 new design and construction projects currently underway or planned for the near future. Projects such as the \$6 billion Waste Treatment Plant at the Hanford Site in Richland, Washington make substantial demands on the Board's technical oversight resources in specialty skill areas such as seismic engineering of structures, geotechnical reviews, concrete chemistry, systems engineering, and hazard analysis. 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. (See Section 5, page 10, for a list of DOE projects currently underway or planned for the near future.)

During periods of constrained budgetary resources, it is tempting to cut back on the funding dedicated to safety programs. The real question is not what safety programs cost, but what costs are avoided by applying excellent safety principles. Financial losses incurred during recovery from major accidents can be in the billions of dollars. The cost of reacting to multiple safety failures can be disruptive to accomplishing DOE's national security mission on-schedule and within budget. In this context, the independent oversight recommendations by the Board and the subsequent actions by DOE have not only reduced the likelihood of accidents, but also improved formality of operations needed to maintain productivity in defense nuclear facilities.

As a small agency with one program account supporting 100 FTEs and one mission—to protect the health and safety of the public and workers at DOE defense nuclear facilities—the Board constitutes a wise investment toward improving the safety and reliability of the vital nuclear defense activities, at a small fraction of the potential economic and health costs of a nuclear accident.

2. JUSTIFICATION FOR ADDITIONAL FUNDING

The number and complexity of DOE defense nuclear projects and facilities that require the Board's health and safety oversight attention have increased significantly. To continue the Board's oversight capabilities at current levels, an additional \$824 thousand in new budget authority for FY 2005 is requested. These funds will be used to maintain the current authorized personnel ceiling of 100 FTEs and fund technical expert contracts to augment staff capabilities, where it is not practical or desirable to employ permanent staff, in highly specialized and technical disciplines. The budget request also includes funds to contract for independent audit services. These services are required to perform the financial statement preparation and internal controls review mandated by the Accountability of Tax Dollars Act of 2002. Specific requirements for additional funding for contractor and staff expertise are described below:

Oversight of New DOE Design and Construction Projects

As discussed in the Executive Summary, the Board continues to expend considerable resources to review the ongoing design effort as well as the construction activities at new DOE defense nuclear facilities such as 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. WTP is a complex, high risk program that will require more than 15 years to complete. The Board is required by law to review the design and construction of projects such as WTP to ensure the safety of the public and workers is addressed early in the design process. The WTP is one of more than 20 new DOE design and construction projects currently underway, or planned for the near future. (See Section 5, page 10, for a full discussion of these projects.) 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. The Board requires \$400,000 in additional technical contract funds in FY 2005 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.

Nuclear Weapon Life Extension and Modernization Programs

DOE's nuclear weapons stockpile stewardship and management operations are unique in that they include nuclear explosive activities and experiments involving collocated high explosives and nuclear material. Unlike commercial nuclear facilities, 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 and the potential for explosive dispersal of radioactive materials or inadvertent nuclear detonation.

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. 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.

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, completed in December 2003 and provided to the Congress and the Secretary of Energy, reviewed the storage of defense plutonium and defense plutonium materials in connection with the disposition program provided in Section 3182, *Disposition of Weapons-Usable Plutonium at Savannah River Site*, of this Public Law and the Department of Energy's (DOE) amended Record of Decision for fissile materials disposition. In the report, the Board addressed:

- The suitability of KAMS and related support facilities for monitoring and observing any defense plutonium materials stored in KAMS,
- The adequacy of provisions made by DOE for remote monitoring of such defense plutonium materials by way of sensors and for handling of retrieval of such plutonium materials, and
- The adequacy of KAMS should such defense plutonium materials continue to be stored in KAMS after 2019.

Additionally, the report included proposals the Board considered appropriate to enhance safety, reliability, and functionality of KAMS.

Congress directed the Board to perform this study to determine if DOE's plan to use the KAMS facilities provides adequate protection of public and worker health and safety. Prior to the KAMS proposal, the DOE had designed a state-of-the-art facility, the Actinide Packaging and Storage Facility (APSF) at SRS, to store plutonium materials now located throughout the DOE weapons complex. Even though the APSF facility was designed and excavation begun in 2001, the DOE cancelled the facility when the total project cost estimate became excessive (greater than \$400 million), and the Plutonium Immobilization Facility (now cancelled) provided a potential disposition path for some of the material. The Board was tasked to review the KAMS proposal because of its expertise in providing an independent health and safety oversight perspective.

To date, the Board's effort to complete this review and prepare the required report has included more than 2,600 technical staff hours. Twelve on-site reviews to evaluate current plutonium storage conditions, plans for stabilization and packaging for long-term storage, and long-term storage plans at SRS were conducted by the Board's staff. It is estimated that the Board expended approximately \$300,000 to complete this study, an amount not included in the Board's FY 2003 appropriation. Additional funding will be needed to conduct the follow-up implementation work associated with the recommendations in this study.

Tax Accountability Act

Funding is needed to comply with the Accountability of Tax Dollars Act of 2002 requiring preparation and auditing of financial statements. As a small agency, the Board received a waiver from these requirements for FY 2003 but must comply with the Act in FY 2004 and future years. The additional \$40,000 will fund independent auditing services to examine and report on financial statements prepared by the Board's accounting services provider, GSA's Heartland Finance Center.

Fully Fund the Salaries and Benefits Account

Additional funding is needed to help the Board pay for the out year impacts of the 4.1 percent cost-of-living pay increases effective in January 2003 and January 2004, as well as the projected 1.5 percent increase in January 2005. An additional \$424,000 is needed to fund the out year impacts of these increases. Without full funding of these accounts, the Board has no alternative but to reduce staff -- the backbone of our health and safety oversight program. The Board is currently operating with only 94 staff and four 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 by maintaining the currently authorized 100 FTE ceiling. With nearly 70 percent of the Board's budget dedicated to paying for staff salaries and benefits, the financial impact of these cost-of-living pay increases is especially severe, and has a direct impact on the Board's ability to fulfil its mission.

3. SAFETY OVERSIGHT STRATEGY

Maintaining an effective safety oversight program that fulfills the broad mandates of the Board's enabling legislation (see Appendix A) requires a constant reassessment of health and safety conditions throughout DOE's defense nuclear complex. The Board continues to focus its attention on the most hazardous DOE operations and complex-wide health and safety issues, consistent with the Board's safety oversight approach and its strategic plan. Specifically, the Board has prioritized the application of its resources to emphasize nuclear safety review activities at the following sites, plants, and facilities:

- *Pantex Plant (Texas)*—Stewardship and maintenance of the nuclear weapons stockpile including assembly, evaluation, maintenance, and dismantlement of nuclear explosives and the storage of special nuclear material, particularly plutonium pits.
- *Savannah River Site (South Carolina)*—Operation of existing tritium facilities and design and construction of new facilities for the extraction of tritium, storage of special nuclear material, and the stabilization of high-level waste and residual materials from the former production of the Nation's nuclear weapons arsenal, and the disposition of excess plutonium.
- *Nevada Test Site*—Stewardship of the nuclear weapons stockpile, including subcritical experiments, and the capability to deal with damaged nuclear weapons and improvised nuclear devices.
- *Oak Ridge Y-12 National Security Complex (Tennessee)*—Stewardship and maintenance of nuclear weapons components including highly enriched uranium processing; fabrication, assembly, and disassembly of nuclear weapon components and subassemblies; and storage of nuclear materials, including uranium from weapon components.
- *Los Alamos National Laboratory (New Mexico), Lawrence Livermore National Laboratory (California), and Sandia National Laboratories (New Mexico and California)*—Support for stockpile management and stewardship of the nation's nuclear weapons, including research and enhanced surveillance of aging weapons, and the processing of nuclear materials.
- *Hanford Site (Washington)*—Remediation of high-level radioactive waste, stabilization of corroding highly radioactive spent nuclear fuel currently stored in the K-East and K-West Basins, and stabilization of residual material from plutonium production.
- *Rocky Flats Environmental Technology Site (Colorado)*—Stabilization of residuals of plutonium production and deactivation of numerous highly contaminated buildings.

The primary nuclear hazards involved in the above DOE defense nuclear operations include inadvertent nuclear detonation; dispersion of hazardous nuclear material resulting from high explosive violent reactions, explosions, fires, leaks, operator error, and natural phenomenon events; release of radioactive tritium gas; nuclear criticality; and direct exposure to extremely high radiation.

Sources of information used by the Board in formulating its assessments, evaluations, and recommendations to the Secretary of Energy are varied. They include testimony from public hearings and meetings, Congressional inquiries, reports from site representatives, staff issue papers, site visits, Implementation Plans for the Board's recommendations, responses to reporting requirements, and correspondence from workers and union representatives at the DOE sites. The Board's priorities must be flexible to reflect its assessment of the risks and potential effects on the health and safety of the public or workers, resulting in revised technical review assignments for the Board's staff.

On the basis of 14 years of operating experience, the Board has established the following guiding principles for maximizing the effective use of its resources:

- **Ownership of Safety** - The primary responsibility for ensuring protection of the health and safety of the public and workers belongs with DOE line managers and extends in an unbroken chain from the Secretary of Energy to the workers on the floor. Oversight can bolster but never replace the commitment of line management and the workers to integrating proper health and safety practices in work planning and performance.
- **Oversight Role** - As an external "action-forcing" agency, the Board influences the actions of DOE line management only to the extent necessary to ensure adequate protection of the public and worker health and safety. While the Board is empowered to identify current and potential safety problems and offer alternative strategies for addressing each issue, resolving these safety problems remains the sole responsibility of DOE.
- **Meaningful Safety Programs** - Effective safety management demands that safety expectations be clearly defined and tailored to specific hazards at all levels—site, facility, and activity. Broad, complicated instructions are ineffective and often ignored at the working level, whereas a safety program that the workers can understand and is relevant to the work is more likely to be embraced by the workers.
- **Technical Competence** - Technical expertise is required to define and ensure compliance with controls commensurate with the identified hazards. Without sufficient numbers of qualified scientific and technical personnel, DOE cannot act as a knowledgeable and demanding owner/customer who is qualified to require the laboratories and contractors to safely deliver the products and services for which they are being paid.

- **Risk-based Oversight** - 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. Given the size of the DOE defense nuclear complex and the limited oversight resources of the Board, assigning review priorities based on perceived risk levels is a continual process influenced by reports from 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.
- **Effective Transition Planning** - Safety oversight of defense nuclear facilities will be accomplished in full cooperation with other agencies and individual states, in compliance with the Atomic Energy Act of 1954, as amended, and other applicable laws. The Board has worked to ensure a smooth transition from Board oversight to regulation as defense nuclear facilities pass from operations, deactivation, and decommissioning to state and EPA-regulated cleanup, demolition, and environmental restoration activities.

4. STRATEGIC MANAGEMENT OF HUMAN CAPITAL

As clearly recognized by the Congress when evaluating the Board, the ability to effectively carry out an independent, technical oversight program throughout the DOE weapons complex is dependent on the technical capability of the Board Members and staff.

The conferees believe that the DNFSB is a unique Federal agency, in that its mission (is) to oversee the activities of another federal department whose work is highly technical and potentially dangerous, and that to properly carry out its mission, not only the DNFSB members but also its limited staff must be technically competent in all major phases of nuclear safety.¹

Simply stated, the ability of the Board to fulfill its public and worker health and safety mission rests heavily on attracting and retaining top caliber technical staff. From its formation, the Board was free to create a streamlined organization, specifically tailored to meet its specialized scientific and technical mission. The Board has been successful in creating a work environment that emphasizes excellence as the standard for staff performance and rewards the staff accordingly. The pay banding and pay-for-performance programs developed and implemented by the Board have proven to be effective in hiring technical talent, holding employees accountable for their performance, and rewarding outstanding performance on the job.

¹ National Defense Authorization Act for Fiscal Year 1991, Conference Report, H.R. Conf. Rep. No. 923, 101st Cong. 2nd Sess. 767 (1990).

The need for the Board to have outstanding technical talent for its oversight effort becomes even more critical in light of DOE's recent recruitment and retention problems for critical scientific and technical staff.² The Board has assembled a 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 weapons safety, storage of nuclear materials and nuclear criticality safety, and waste management. Excluding first-year participants in the Board's Professional Development Program, 90 percent of the Board's technical and legal staffs, hold advanced scientific and technical degrees, of which 33 percent are at the Ph.D. level. Consequently, the Board performs a vital role in ensuring that health and safety problems are identified and solved.

The challenges in recruiting and retaining a high-quality, diverse workforce can be grouped into three categories: (1) competition from the private sector, (2) fiscal constraints, and (3) the Federal Government not being perceived as an employer of choice. Competition for top engineering professionals is intense. Even with the special hiring and pay authorities granted to the Board, private industry can easily out-bid and out-perk the Board for the top-caliber engineering talent that the Board needs to conduct its health and safety oversight operations.

The Board has also found that the Federal downsizing campaigns of the 1990s, coupled with the perception that the Federal bureaucracy stifles creativity and fails to encourage and reward outstanding work, have created obstacles to the Board's recruiting campaigns. Recruitment and retention of recent college engineering graduates, especially women and minorities, is difficult in the current job market and will become even more challenging with a renewed interest in the commercial nuclear market.

Recruiting and retaining senior technical staff to serve as site representatives will continue to be vital and challenging. The Board maintains an onsite safety oversight presence at priority DOE defense nuclear facilities by assigning experienced technical staff members to full-time duty as site representatives. The site representative program provides a cost effective means for the Board to closely monitor processes and practices, and to identify health and safety concerns promptly. As site representatives frequently interact as the Board's representatives with the public, workers, and federal, state and local officials, it is important that they be of the highest technical capability.

The Board plans to continue its recruitment of engineering and technical students through its Professional Development Program (PDP) to maintain the Board's staff capabilities. The PDP is a three-year program that offers entry-level positions on the Board's technical staff. Through a technical mentor, PDP recruits are provided a series of individually tailored

² DOE Audit Report on "Recruitment and Retention of Scientific and Technical Personnel," DOE/IG-0512, (July 2001)

developmental assignments, formal academic schooling, and a one-year “hands-on” field assignment. This is a highly competitive program to attract the next generation of scientific and technical talent to federal service.

To foster a sustained learning environment, the Board provides opportunities for training and personal development to all of its employees. Based on current research, employees rank training among the top three areas of importance when making career decisions. Therefore, to aid in retaining its technical staff, the Board has maintained a robust training program. In a typical fiscal year, the Board expends approximately \$3,400 per technical employee for training.

Using the excepted service hiring and classification authorities granted to the Board, together with the other hiring and retention authorities (e.g., recruitment and relocation bonuses, retention allowances and the newly enacted student loan repayment program), the Board has gained some success in competing for scientific and technical staff. Other Federal agencies such as the National Institute of Standards and Technology (NIST), the National Science Foundation (NSF), and the National Institutes of Health (NIH) have proven that scientific and technical personnel can be recruited and retained, provided funds are made available to pay for the added salary and benefits.

During FY 2004, the Board intends to hire selected technical experts to maintain the Board’s highly competent technical staff. By the end of FY 2004, the Board expects to hire replacement employees to reach the Board’s FTE allowance of 100 (67 percent of the Board’s statutory ceiling). Anticipated recruiting includes a Presidential appointment to the Board and a senior nuclear weapons engineer. During FY 2005, the Board’s recruiting will maintain the 100 FTE ceiling.

5. FUTURE CHALLENGES FOR THE BOARD’S SAFETY OVERSIGHT

The following discussion addresses some of the key challenges facing the Board in its safety oversight of DOE that will require continuing attention by the Board and its staff. The Board’s budget request for \$20,268,000 and associated performance objectives in Appendix D have been structured to anticipate and meet these workload challenges.

Nuclear Weapon Life Extension Programs. DOE is ramping up its programs to extend the life of weapons in the enduring stockpile. These life extension programs will require more, and increasingly complex, operations to disassemble, refurbish, reassemble, and re-certify nuclear weapons and components than had been done in the recent past when smaller numbers of weapons were disassembled only for inspection. In addition to larger numbers of unit operations, DOE will also be required to develop or restart intricate and potentially hazardous operations to refurbish or re-manufacture individual weapon components. To effectively oversee these operations and at the same time strike a proper balance among national security requirements, schedules, and safety management issues, the Board will need to maintain and at times augment its technical staff with individuals who possess the necessary expertise.

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 numerous 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).

- **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.
- **Los Alamos National Laboratory** - Decontamination and Volume Reduction System - to provide a facility for examining and repackaging transuranic waste. MODERATE SIGNIFICANCE, LOW COMPLEXITY, MODERATE RISK.
- **Oak Ridge National Laboratory (Melton Valley Transuranic/Alpha Tank Waste Treatment Project)** - to retrieve, treat, and dispose of wastes from the ORNL Melton

Valley Tanks. MODERATE SIGNIFICANCE, MODERATE COMPLEXITY, MODERATE 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.
- **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 - HLW Salt Processing Facility** - to be used to remove cesium from high-level waste. The cesium stream would go to the Defense Waste Processing Facility. The low-activity stream would go to the Saltstone Production Facility for disposal in grout. HIGH SIGNIFICANCE, HIGH COMPLEXITY, HIGH 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.
- **Fernald - Silo Project** - to retrieve and dispose of, or store low-level waste from the Fernald Silos. HIGH SIGNIFICANCE, MODERATE COMPLEXITY, LOW 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.

- **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.

Accelerated Cleanup. Following considerable oversight and constructive engagement by the Board, DOE is stabilizing and disposing significant amounts of the hazardous remnants of nuclear weapons production. Substantial progress is being made toward characterizing, stabilizing, and dispositioning many high-hazard nuclear materials, and several associated new facilities are either in design, construction, or initial operation. However, DOE is encountering difficulty in maintaining its momentum in all areas of this important risk reduction effort. The Board will continue to urge DOE to maintain, and in some areas accelerate, its activities associated with these risk reduction activities.

Deactivation of Nuclear Facilities. Along with stabilizing and disposing of hazardous materials, DOE is accelerating its effort to deactivate many contaminated facilities that are no longer needed. The mission to conduct high-risk activities associated with facility deactivation will continue across the DOE defense nuclear complex at an increasing rate in the coming years. These activities involve hands-on hazardous work that requires hazards evaluation, development of work controls and procedures, worker training, and good conduct of operations. The Board's continued attention and increased commitment of resources will be required to ensure that DOE conducts these high-risk activities safely.

DOE Technical Competence and Federal Oversight. Since the end of the Cold War, maintaining the technical competence of federal and contractor personnel essential to DOE's defense nuclear mission has been an increasingly difficult task. While the Board has always placed considerable emphasis on this vital aspect of safety management, skilled employees continue to leave the workforce. The turnover in senior DOE leadership that resulted from the years of Government downsizing and curtailed investments in human capital will necessitate close attention to rebuilding the appropriate technical skills, abilities, and experience. The Board will need to apply significant resources to ensure that DOE recruits and develops the required technical capabilities, and that the new line management emphasizes safety in the conduct of its operations.

DOE Oversight of Its Contractors. DOE is reducing the size of its federal workforce, restructuring its organization to place more responsibility in field elements, and transitioning to a "performance-based" directives system. These changes are fundamentally altering the amount and specificity of DOE's safety oversight of hazardous nuclear operations and result in an increased dependence on contractors to evaluate and ensure their own performance. During this transition, the Board will be required to focus considerable attention on day-to-day hazardous operations and safety issues to ensure that safety performance is not diminished as an unintended consequence of this change.

Nuclear Weapons Knowledge. Another long-term technical competence issue requiring significant attention is the need to maintain a cadre of professionals capable of addressing nuclear weapon assembly and disassembly safety issues. The needed expertise is not available

outside of the national weapon laboratories and is only developed through careful study of and experience working on issues directly affecting the safety of nuclear operations. Maintaining an environment that encourages the brightest minds to continue to devote a portion of their time to developing that expertise remains a challenge. This topic was the focus of the Board's Recommendation 2002-2, *Weapons Laboratory Support of the Defense Nuclear Complex*. The Board and DOE will need to pay close attention to resolving this issue in the future.

Development and Implementation of Safety Controls. Starting in 2003, DOE nuclear facilities were required by the Nuclear Safety Management Rule, 10 CFR, Part 830, to submit safety analyses and controls that comply with or are consistent with specific, uniform expectations. In response, many DOE defense nuclear facilities have developed new analyses and, perhaps more importantly, new safety controls. In many cases, the choice of these new safety controls was constrained because the facility and operating equipment had been built several years or decades ago. As a result, DOE and its contractors have reclassified existing equipment to be safety-related and, in a departure from past practice, have developed a significant number of new safety-related administrative controls to ensure safety. In the coming years, the Board will devote considerable effort to ensuring that these controls are designed, developed, implemented, and maintained in a manner that will ensure their effectiveness to protect the workers, the public, and the environment. The Board has already started to focus on this area by issuing Recommendation 2002-3, *Requirements for the Design, Implementation, and Maintenance of Administrative Controls*.

Activity-Level Integrated Safety Management (ISM). Along with the emphasis on facility-level safety analyses and controls, the Board has been emphasizing the importance of ensuring safety at the individual activity level. For many years, the Board has encouraged DOE to use a concept the Board termed Integrated Safety Management (ISM) to ensure that DOE defense nuclear work is well defined, that hazards are identified and controlled, that work is performed in a careful manner in accordance with the safety controls, and that DOE uses appropriate feedback mechanisms to ensure continuous improvement. The concept of ISM is particularly well suited to ensuring safety at the activity level. The Board will be focusing significant effort in the future to ensure that DOE continues to make progress in this important area.

6. SAFETY OVERSIGHT IN PRACTICE

The Board's Annual Report to Congress (available on the Internet at www.dnfsb.gov) provides detailed information on the Board's performance each year. Representative examples of the Board's contributions to the health and safety of the public and workers, resulting from the practical application of the above safety oversight principles, are discussed in the following paragraphs.

Weapons Laboratory Support of the Defense Nuclear Complex. Within the nuclear weapons complex, inadequate processes for communicating safety information have resulted in unsafe activities and near misses that could have been prevented. In October 2002 at the Y-12 National Security Complex, a piece of metal weighing 150 pounds was unexpectedly ejected

from an item on which a test had previously been conducted. The piece of metal traveled vertically and to the side of machining equipment, finally coming to rest approximately 15 ft from the point of origin. The possibility of this occurrence was known to the design agency, but a memorandum regarding the hazard was only provided to Y-12 management after the event.

Concerned by similar instances of poor communication, the Board has included discussions of the roles and responsibilities of technical personnel in discussions and correspondence with DOE, and in public meetings. The Board has repeatedly suggested that for each weapon system, the responsible weapon laboratory should assign a senior, technically competent weapon expert to serve as the single point of contact for that weapon. Clear and consistent communication of safety-related information is improved by the existence of a single point of contact for each weapon to ensure that all safety-related issues are appropriately prioritized and tracked to resolution.

In October 2002, the Board issued Recommendation 2002-2, *Weapons Laboratory Support of the Defense Nuclear Complex*, urging DOE to take decisive action in this area. In response, the National Nuclear Security Administration instructed the Laboratory Directors to establish the recommended point of contact positions, and assign them the responsibility to integrate and coordinate for the laboratory all information needed to provide technical support to the weapons complex. In parallel, DOE is establishing at each site office responsible for a weapon laboratory the responsibility for tracking and resolving safety-related priority and resource conflicts that cannot be resolved at a lower level. The overall result should ensure a clear and concise process for raising, communicating, and resolving safety-related issues.

Suspect/Counterfeit Parts Issue. In June 2002, Department of Defense investigators notified the DOE that a vendor of heat treating services for aluminum parts supplied potentially improperly heat treated aluminum to firms who supplied aluminum parts to the DOE. Notwithstanding repeated assurances from the DOE QAWG that reviews would be conducted for the presence of potentially nonconforming heat treated aluminum in safety related or mission sensitive applications affecting defense nuclear facilities, DOE failed to adequately assess whether such parts were installed until the Board brought the matter to the attention of the Secretary of Energy. The Board also observed that DOE had repeated several of the missteps that occurred in response to the similar notification of quality issues affecting semiconductor devices in 1996. As a result of the Board's efforts, DOE has fundamentally restructured their quality assurance programs.

The Board's staff continues to provide oversight and technical assistance to DOE in order to identify and prevent the introduction of suspect/counterfeit parts into safety related or mission sensitive applications affecting defense nuclear facilities. The Board's oversight and timely intervention in dealing with suspect/counterfeit parts has been pivotal in energizing the establishment of DOE quality assurance programs vital to ensuring public health and safety at DOE's defense nuclear facilities.

Hanford Waste Treatment Plant Design. In FY 2003, the Board expended considerable resources reviewing the design for the Waste Treatment Plant (WTP) at the Hanford Site. In November 2002 the Board notified DOE of several recently discovered

potential safety issues. The following provides a summary of the issues and the actions taken to address the Board's concerns:

- Hydrogen hazards within the WTP were not sufficiently understood. At the request of the Board, a research program has been established to develop the necessary information required to design an adequate hazard control strategy.
- The WTP cesium ion exchange process was not using preventive design features that could eliminate potential hazards resulting from the use of organic ion exchange resins when they are exposed to loss of cooling situations. After the Board raised this concern, an emergency elution capability will be included in the design.
- Unverified design assumptions critical to safety were not being adequately tracked and resolved. On the recommendation of the Board, DOE's prime contractor developed the database tools to track unverified assumptions, and processes to link research and technology development, engineering, and safety in order to ensure that all safety-related design assumptions are technically sound.
- DOE's contractor was not successfully capturing all of the critical design features being relied upon for safety. The Board recommended the contractor revise its processes for design evaluation to ensure the capture of safety-related design features.
- The Board identified that during a loss-of-cooling accident, significantly higher temperatures could result, and hydrogen generation rates would increase exponentially. In response to the Board's finding, DOE began to evaluate the impact of this scenario on safety-related design features.
- The Board found that design basis event and severity level calculations lacked technical quality. In response to the Board's finding, DOE's contractor has since revised its procedures for checking design calculations and been able to increase their quality to acceptable levels.

The Board also maintains oversight of WTP construction. When out-of-specification concrete was placed for the facility basemat, the Board questioned the effect this could have on the structural integrity of the building under all design loading conditions. In response to the Board's inquiry, WTP developed a systematic approach to understanding and correcting the areas of weak concrete.

Software Quality Assurance. The design and operation of many of DOE's defense nuclear facilities relies on analysis and operational support developed using computer codes. During the past few years, the Board and DOE have identified problems caused by inadequate software design, implementation, testing, configuration management, and training. These problems could lead DOE and its contractors to rely on computer-generated safety information that is erroneous. Therefore, in late 2002, the Board issued Recommendation 2002-1, *Quality Assurance for Safety-Related Software*, proposing significant changes to DOE processes and practices for software quality assurance (SQA). These changes included clearly assigning

responsibilities and authorities for SQA, issuing revised directives for software development and use, and recommending software packages for use in safety system analysis and design.

Since the recommendation was issued, the Board has worked with DOE to develop and implement a plan to resolve these SQA problems. One major positive step was the creation of an Office of Quality Assurance Programs reporting to the Assistant Secretary for Environment, Safety and Health. This office is leading the DOE effort to determine which industry best practices should be applied to safety software, to establish qualification standards for personnel whose duties involve SQA, and to develop criteria for reviewing the SQA practices at defense nuclear facilities.

In addition to working with DOE to develop the implementation plan for this recommendation, the Board has continued to review the implementation of software procedures and practices at defense nuclear facilities. During FY 2003, these reviews included:

- The Savannah River Site, focusing on the new Tritium Extraction Facility.
- The Pantex Plant, examining recently implemented software used to assist personnel in controlling the movement of high explosives and nuclear material between facilities onsite.
- The Hanford Site, evaluating the design and analysis, as well as the control and safety systems, for the new Waste Treatment Plant.
- Los Alamos National Laboratory, reviewing the implementation of the software engineering practices for the criticality control systems at the Los Alamos Critical Experiments Facility (LACEF).

Each of these reviews resulted in positive actions by the DOE to resolve immediate problems, as well as corrective actions designed to minimize the number and impact of future software related problems.

7. DIRECT SERVICE DELIVERY TO CITIZENS

The Board continues to be sensitive to the need for citizen involvement. To that end, the Board has used open public meetings and hearings, as well as its Website (www.dnfsb.gov), to increase public awareness, communicate the Board's activities, and solicit citizen comments and issues.

The Board has also continued its practice of meeting with state and local officials, labor leaders, DOE's facility workers, citizen advisory boards, public interest groups, and area residents to exchange information and inform interested parties of the Board's work. Board Members have conducted public meetings and hearings in the vicinity of DOE's defense nuclear facilities, most recently near the LLNL Site in California. To date, a total of 36 public meetings have been conducted at or near DOE sites and 52 in Washington, D.C. The records of these meetings are made available to the public.

In compliance with Section 508 of the Rehabilitation Act, the Board's Website is accessible for individuals with disabilities and offers convenient public access to the Board's oversight work. The Board continues to offer downloadable public documents and is increasing its capability to provide Webcasts of public meetings to ensure broader citizen access to the efforts of the Board.

8. CONCLUSION

Nuclear weapons have been and will continue to be an essential part of the nation's defense strategy. However, the end of the cold war has caused a shift in how DOE maintains and supports these weapons. Consequently, the importance of the Board's mission of ensuring and improving the safety of operations at DOE's defense nuclear facilities has become increasingly more important. The Board accomplishes this vital mission by providing independent, expert advice to the Secretary of Energy, identifying the nature and consequences of any significant potential threats to public health and safety, and elevating such issues to the highest levels of authority.

The five full-time Board Members, together with a small but highly competent staff, provide a cost-effective organizational arrangement for achieving the added safety assurance that the public seeks and rightfully expects. The Board's budget request of \$20,268,000 to be used for staff salaries and necessary supporting expenses, such as travel to DOE's defense nuclear facilities and maintaining our onsite presence with site representatives, will provide the funding needed to conduct the health and safety review actions planned by the Board for Fiscal Year 2005. This amount 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.

STATUTORY MISSION OF THE BOARD

Congress established the Defense Nuclear Facilities Safety Board (Board) in Public Law 100-456 of September 29, 1988. Created as an independent establishment within the Executive Branch, the Board is made up of five Members appointed from civilian life by the President, by and with the advice and consent of the Senate. The Board's enabling statute requires that the Board Members be respected experts in the field of nuclear safety with demonstrated competence and knowledge relevant to the independent investigation and oversight functions of the Board. The Senate confirmed the first five Board Members on October 19, 1989. The statutory mission of the Board includes the following major functions:

- **Review and Evaluation of Standards.** The Board shall review and evaluate the content and implementation of the standards relating to the design, construction, operation, and decommissioning of defense nuclear facilities of the Department of Energy (DOE), including all applicable DOE Orders, regulations, and requirements at each Department of Energy defense nuclear facility. The Board shall recommend to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected. The Board shall include in its recommendations necessary changes in the content and implementation of such standards, as well as matters on which additional data or additional research is needed.
- **Investigations.** The Board shall investigate any event or practice at a Department of Energy defense nuclear facility which the Board determines has adversely affected, or may adversely affect, public health and safety.
- **Analysis of Design and Operational Data.** The Board shall have access to and may systematically analyze design and operational data, including safety analysis reports, from any Department of Energy defense nuclear facility.
- **Review of Facility Design and Construction.** The Board shall review the design of a new Department of Energy defense nuclear facility before construction of such facility begins and shall recommend to the Secretary of Energy, within a reasonable time, such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety. During the construction of any such facility, the Board shall periodically review and monitor the construction and shall submit to the Secretary of Energy, within a reasonable time, such recommendations relating to the construction of that facility as the Board considers necessary to ensure adequate protection of public health and safety. An action of the Board, or a failure to act, under this paragraph may not delay or prevent the Secretary of Energy from carrying out the construction of such a facility.

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

OBJECT CLASS SUMMARY

Actual obligations for FY 2003, projected obligations for the remainder of FY 2004, and the Board's Budget Request for FY 2005 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 2005 expenditure request includes funding of \$14,647,283 to support the projected salary and benefit costs for 100 FTEs. The funding for salaries and benefits represents 69 percent of the Board's FY 2005 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 4.1 percent beginning in January 2004 as approved in the Consolidated Appropriations Act, 2004 (P.L. 108-199).
- Proposed pay increase of 1.5 percent beginning in January 2005.
- Employee benefits of 26 percent of salaries, or \$29,483 per FTE in 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 has and will continue to be critical to the successful accomplishment of the Board's mission. The Board has assembled a small 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 weapons safety, storage of nuclear materials and nuclear criticality safety, and waste management. Excluding first-year participants in the Board's Professional Development Program, 90% of the Board's technical and legal staffs, hold advanced scientific and technical degrees, of which 33% are at the Ph.D. level. 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 receive 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. Full-time site representatives are stationed at the following 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. During FY 2003, the Board evaluated the decreasing risks to the public and the environment as DOE completes facility deactivation efforts and determined that it was appropriate to discontinue full time site representative coverage at the Rocky Flats Environmental Technology Site (RFETS). The Board, however, still maintains a field office and has a cognizant engineer assigned to review activities at the site. This maintenance of Board oversight presence through periodic visits to RFETS assures that DOE maintains public and worker safety standards during the course of the deactivation.

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 first-hand 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 \$642,000 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 approximately 150 team visits through the end of FY 2003 to major defense nuclear sites in support of its high priority public health and safety 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 inquiry.

Transportation of Things. The Board has included \$105,000 in its FY 2005 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 \$2,265,624 to reimburse the General Services Administration (GSA) for projected office rental costs. This overhead expense represents approximately 11 percent of the Board's FY 2005 Budget Request.

Communications and Utilities. The FY 2005 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.

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 the 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, with 98 full-time staff and Board Members employed as of January 31, 2004. While the Board strives to maintain a highly skilled staff, it is not practical or desirable to maintain permanent staff in all possible disciplines. Therefore, it is important to have the funds available to immediately contract for this expertise when needed. For example, following review of construction plans for the High Level Waste Treatment Facility at Hanford, the Board concluded that concrete reinforcement issues had not been adequately addressed by DOE. The Board obtained specialized contractor expertise in the area of concrete reinforcement and loading to augment its internal review capability and avoid any adverse 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 is included in Appendix C. The FY 2005 Budget Request includes \$1,157,192 in this account for technical support contracts to assist the Board in its health and safety reviews.

Other Services. The budget request includes \$1,567,000 to fund a wide range of recurring administrative support needs of the Board in FY 2005 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 \$275,000 for reimbursable support agreements with other federal agencies to provide services such as accounting, payroll, health unit, EAP services, Library of Congress FedLink, and investigations for security clearances.

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.

Equipment. The Board will continue to replace equipment that has reached the end of its life cycle and expend funds for technologies that provide a greater outreach to the public. The FY 2005 Budget Request includes \$250,000 to replace outdated computer workstations, laptops, and field equipment. Also, the Board will purchase upgraded firewall protection, improved communications equipment and other office equipment such as printers, copiers and graphic presentation equipment.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

FY 2005 CONGRESSIONAL BUDGET REQUEST - 02/02/2004

BUDGET ACCOUNT	COST ELEMENT	FY 2003 OBLIGATIONS (ACTUAL)	FY 2004 PROJECTED FINANCIAL PLAN	FY 2005 PROJECTED BUDGET REQUEST
PERSONNEL SALARIES -- (11)		\$ 10,213,389	\$ 11,097,000	\$ 11,699,000
PERSONNEL BENEFITS -- (12)		\$ 2,594,376	\$ 2,863,742	\$ 2,948,283
TRAVEL -- (21)		\$ 691,979	\$ 642,000	\$ 642,000
TRANSPORTATION OF THINGS -- (22)		\$ 141,311	\$ 160,000	\$ 105,000
RENTAL PAYMENTS TO GSA -- (23.1)		\$ 2,313,106	\$ 2,252,735	\$ 2,265,624
COMMUNICATIONS & UTILITIES (23.3)		\$ 251,154	\$ 154,500	\$ 154,500
PRINTING & REPRODUCTION -- (24)		\$ 28,541	\$ 27,000	\$ 27,000
CONSULTING SERVICES -- (25.1)		\$ 1,226,913	\$ 1,200,000	\$ 1,157,192
OTHER SERVICES -- (25.2)		\$ 1,566,185	\$ 1,567,000	\$ 1,567,000
GOVERNMENT SERVICES -- (25.3)		\$ 300,917	\$ 275,000	\$ 275,000
SUPPLIES & MATERIALS -- (26)		\$ 336,956	\$ 295,000	\$ 295,000
CAPITAL ASSETS -- (31)		\$ 292,061	\$ 270,000	\$ 250,000
*** TOTAL OBLIGATIONS ***		\$ 19,956,888	\$ 20,803,977	\$ 21,385,599
NEW BUDGET AUTHORITY		\$ 18,876,500 *	\$ 19,443,602 **	\$ 20,268,000
UNOBLIGATED BALANCE - PREV. FY		\$ 2,929,924	\$ 2,477,974	\$ 1,117,599
RECOVERY OF PRIOR YR OBLIGATIONS		\$ 628,438	\$ -	\$ -
TOTAL BUDGETARY RESOURCES		\$ 22,434,862	\$ 21,921,576	\$ 21,385,599
EST. UNOBLIGATED BAL. - CUR. FY		\$ 2,477,974	\$ 1,117,599	\$ 0
APPROPRIATION		\$ 18,876,500	\$ 19,443,602	\$ 20,268,000
OUTLAYS		\$ 19,605,132	\$ 20,388,000	\$ 20,804,000
STAFF & BOARD MEMBERS (FTE'S)		95	100	100

*\$19,000,000 appropriation; \$123,500 rescission

**\$19,559,000 appropriation; \$115,398 proposed rescission pending FY 04 Omnibus Bill

APPENDIX C

TECHNICAL SUPPORT CONTRACTS SUMMARY

A list of major technical support contracts, with a brief description of each contractor's areas of expertise, is included in this Appendix. The FY 2005 Budget Request includes \$1,157,192 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 01/20/04)

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Dr. Harold Agnew	12/15/04	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 weapons systems.
Mr. Richard Collier	09/30/04	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 J. DiNunno	10/13/04	Provide technical assistance in reviewing, evaluating, and advising the Board on various issues related to Integrated Safety Management (ISM) programs at various defense nuclear facilities.
Dr. Kevin J. Folliard	10/10/04	Provide expertise related to structural performance 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	06/30/04	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.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Dr. Herbert Kouts	12/31/04	Provides a variety of technical expertise on a wide range of subjects associated with safety at DOE's defense nuclear facilities, including: safety management, criticality, DOE's 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	12/31/04	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 recent work include: evaluation of technologies to stabilize plutonium residues, plutonium storage safety issues, and Rocky Flats plutonium stabilization activities.
Dr. James L. Liverman	06/30/04	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, and other radiological and environmental health and safety issues, implementation of Recommendation 2000-2, and reviewing the development of DOE's quality assurance improvement plan.
Management Support Technology, Incorporated	02/28/04	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.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
Mr. Lary M. McGrew	01/31/04	Provide expertise related to the strategic 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.	12/31/04	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	12/31/04	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..
Briere Associates, Inc.	09/30/04	Provide technical editing services of Board documents that include, but are not limited to technical reports, trip 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.

ANNUAL PERFORMANCE BUDGETING OBJECTIVES FOR FY 2005

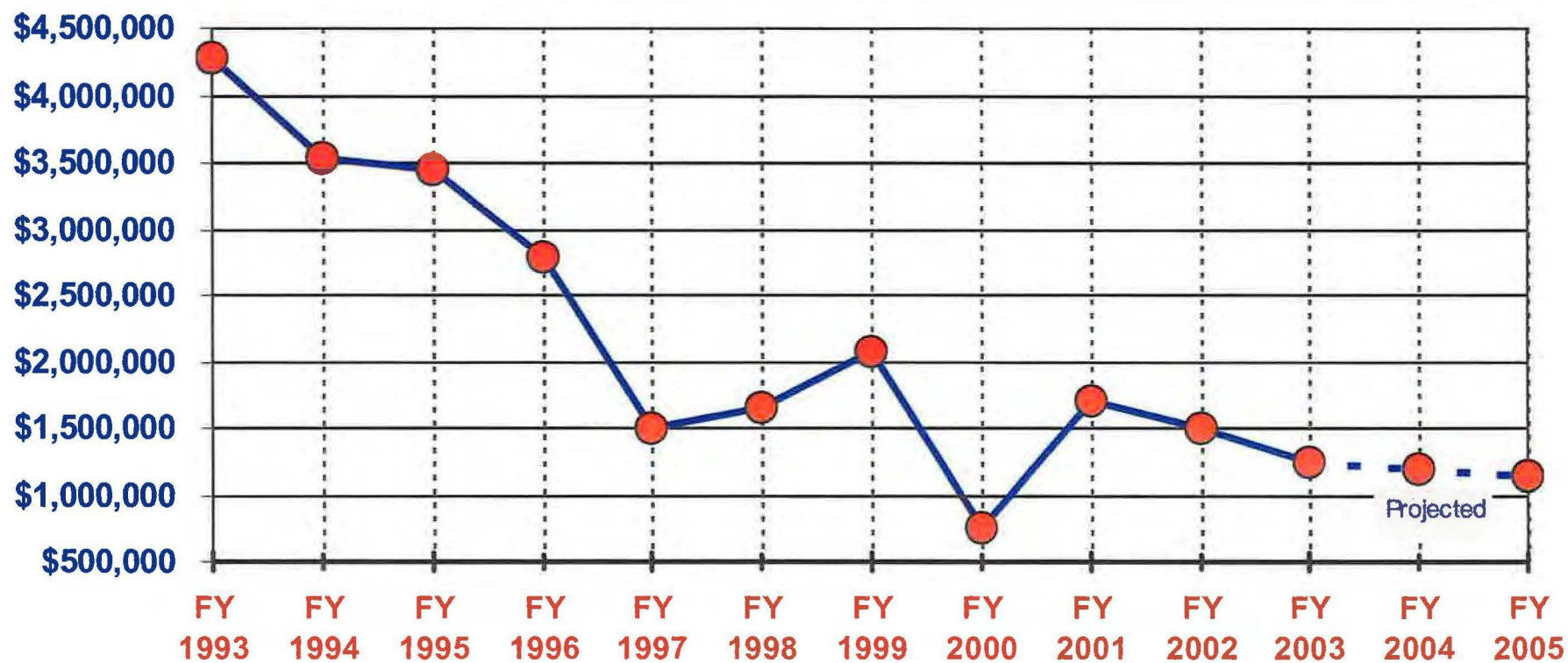
The Defense Nuclear Facilities Safety Board (Board) is an independent Executive Branch agency charged by statute with a broad mission of providing technical health and safety oversight of the Department of Energy's (DOE) defense nuclear facilities and activities.

During 2003, the Board revised its Strategic Plan to better communicate its approach to safety oversight of DOE's defense nuclear activities. This revision was prompted in large part by the significant increases in new design and construction projects DOE has scheduled during the next decade. The Board's Strategic Plan presents the four major performance goals, summarized below, from which annual performance objectives are derived.

1. **Nuclear Weapon's 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 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.

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) 2004 and FY 2005 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.

Defense Nuclear Facilities Safety Board Technical Contracts
Obligations By Fiscal Year



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 Objectives for FY 2005 identifies annual performance objectives that consist of reviews to be conducted in support of the Board's strategic plan, plus the identification of candidate areas for these reviews. An outcome measure for each objective is described as part of the discussion of each annual performance goal. Qualitative assessments of the outcome associated with each annual performance goal are provided in 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) of Board-identified issues and associated DOE responses demonstrates that the Board has had a clear and positive impact on the safety of DOE defense nuclear activities.

Because of the variability of DOE's plans and schedules, some candidate areas identified in the Board's Annual Performance Objectives 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 Appendix D 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 2004 and FY 2005. To place this planning information in context, the performance goals are followed by examples of the Board's accomplishments during the years FY 1999 through FY 2003, as required by OMB's guidance on Performance Objectives.

APPENDIX D

Because the Board's Performance Goals were modified with the recent Strategic Plan revision, the Board's historic accomplishments have been regrouped consistent with these new performance goals. The primary mission of the Board remains unchanged, and so these historic accomplishments map directly into the revised performance objectives.

The examples provided in this appendix do not represent the entire scope of progress made on the FY 2003 Performance Goals. A comprehensive assessment of progress during Calendar Year (CY) 2002 appears in the Board's Thirteenth Annual Report. The Fourteenth Annual Report, due for publication in early 2004, will cover accomplishments during CY 2003.

PERFORMANCE GOAL 1: NUCLEAR WEAPONS 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.

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.

FY 2004 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 (e.g., safety analysis reports developed in response to 10 CFR 830).
- Weapon-specific safety analyses and controls identification and implementation for nuclear weapon activities (the W88, W78, B61, W87, and the B83).
- Conduct of nuclear explosive operations at Pantex (e.g. weapon programs, special purpose facilities and onsite transportation).
- Cross-cutting functional areas at the Pantex Plant, Y-12 National Security Complex, or SRS tritium facilities (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.
- Restart of the Sandia Pulsed Reactor Facility at SNL.
- Compliance with the review process for facility and procedure changes that could impact nuclear safety at the National Laboratories (LANL, LLNL, SNL).

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 2004.

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.

Safety Controls for Specific Nuclear Explosive Operations. The Board and its staff conducted numerous assessments of the safety of specific nuclear explosive activities and documented safety analyses at the Pantex Plant during FY 2003. These reviews, which included the W62 dismantlement and surveillance programs, the LINAC/CT/X-ray Bay, the Special Nuclear Materials Facility, the Separation Test Facility, and Transportation and Staging activities, identified safety-related issues such as the adequacy of safety analyses and controls, the flowdown of controls into operating-level procedures, and the training of supervisory personnel. As a result of the Board's involvement, DOE has taken positive actions to improve the safety of these operations and the adequacy of the supporting safety bases.

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.

Y-12 Restart/Startup Readiness Improvements. A Board letter dated October 3, 2002, identified concerns with conduct of operations, training, and deficiencies in readiness preparations for wet chemistry startup in Building 9212. The NNSA response concurred with this assessment. During the final contractor readiness review in December 2002, marked improvements in conduct of operations, operator training and level of knowledge, equipment performance, and clarity of operating procedures were noted by the review team. In June 2003, the NNSA readiness review for the program to sample and repackage enriched uranium button materials at the Y-12 warehouse (Building 9720-5) found the contractor's execution of process and operations procedures to be satisfactory. The facility personnel were knowledgeable of the operation, hazards, and equipment used in the operation. The Board will continue to impress upon DOE that satisfactory preparations prior to the restart of hazardous activities are imperative to ensure the safety of the workers and public.

Criticality Safety at Y-12. In a November 13, 2002, letter, 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 committed to reduce the amount of stored nuclear materials and to standardize fissile material storage containers. The quantity of different storage containers used at Y-12 has subsequently been reduced, but much work remains to decrease the number further and improve safe operations.

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,

Examples of FY 2003 Accomplishments

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. Activities have been initiated to apply the SS-21 process to the remaining weapons programs. 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 obtained.

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 (17) 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. In a letter dated August 6, 2002, 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

Examples of FY 2003 Accomplishments

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 an 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	
<p>Maintenance Improvement Program at Y-12. In 2001, Y-12 responded to Board concerns that overdue and deferred maintenance was undermining the effectiveness and reliability of safety systems by implementing a maintenance improvement program. In continuing to pursue this issue, 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.</p>	
<p>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.</p>	
<p>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 <i>Chemical Safety Management Program</i>, 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.</p>	
<p>Recommendation 99-1. Continuing to respond to Board Recommendation 99-1, <i>Safe Storage of Fissionable Material called "Pits,"</i> 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.</p>	
<p>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. As a result, all active nuclear explosive operating procedures are being revised to be easier to follow and more accurate, place keeping within procedures has been enhanced, a new emphasis has been placed on procedural adherence by plant management, and procedural adherence occurrences now receive more attention from both NNSA and Pantex Plant management.</p>	
<p>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.</p>	
<p>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 piece-meal, 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, <i>Life Cycle Asset Management</i>, 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.</p>	
<p>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.</p>	

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.

Examples of FY 2001 Accomplishments

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.

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 2000 Accomplishments	
<p>Pit Storage and Repackaging. Currently, the vast majority of plutonium pits at the Pantex Plant are in inadequate storage configurations. In response to the Board's Recommendation 99-1, <i>Safe Storage of Fissionable Material called "Pits,"</i> DOE has started a major effort to repackage all pits into improved storage containers and execute a surveillance plan to ensure that pits in storage remain in a safe environment.</p>	
<p>Y-12 Plant Safety Basis. As a result of staff reviews and several letters from the Board, personnel at the Y-12 Plant have revised the implementation plan for upgrades to the safety bases for their nuclear facilities. This upgrade program will lead to better identification of hazards and necessary controls for prevention and mitigation of potential accidents. This effort will also lead to implementation of the intent of an Integrated Safety Management (ISM) program at the related facilities in a more effective manner.</p>	
<p>W62 Disassembly and Inspection Restart. As a result of the Board's and its staff's focused involvement in the reauthorization of Disassembly and Inspection (D&I) operations for the W62 nuclear warhead, DOE improved safety of the operation by upgrading the tooling and procedures used for the job. This effort, which was prompted by the Board's Recommendation 98-2, <i>Integrated Safety Management at the Pantex Plant</i>, also resulted in a substantial improvement in the technical rigor and thoroughness of the Nuclear Explosive Safety Study Revalidation process. In addition, the experience that DOE and its contractors gained during this effort resulted in an improved process for hazards analysis at Pantex for other nuclear explosive operations, and the execution of that process improved noticeably as a result of the progress made during the W62 D&I restart activities.</p>	
<p>Canned Subassemblies. Comparing safety analyses from the Pantex Plant and Y-12 Plant, the Board's staff noted that the analyses at Pantex did not consider the potential damage resulting from exposure of canned subassemblies (CSAs – the fusion portion of a nuclear weapon) to fires. Further research by the staff on the properties of the materials making up some CSAs indicated a significant hazard at Pantex that was not considered by the site or the Design Agency. Working with safety basis and other engineering personnel from all three sites, the staff assisted in the development of a predictive model of behavior for these components. Controls were subsequently enhanced to ensure that the CSAs were protected.</p>	
<p>LANL Authorization Basis (AB) Documents. The Board noted significant deficiencies in the quality of some AB documents at LANL, and urged DOE and the laboratory to take decisive corrective actions. As a result of highlighting these issues, LANL, under strong guidance from Los Alamos Area Office (LAAO), performed a thorough self-assessment of the quality of AB documentation. LANL found that the documentation for most of the facilities reviewed had significant deficiencies. LANL, under guidance from LAAO, agreed contractually to upgrade the quality of the documentation involved. LANL has also reorganized to improve its ability to assure the quality of ABs.</p>	
<p>LANL Response to Cerro Grande Fire and Potential for Flooding. After firefighters began to control the Cerro Grande fire, the Board conducted onsite reviews of the status of defense nuclear facilities and LANL's facility recovery plans. The defense nuclear facilities incurred little or no significant damage, and facility recovery plans were found to be thorough. The Board also reviewed the potential for flooding as a result of the loss of the ability of soil to absorb water. LANL responded swiftly to the threat of flooding with flood control and mitigation measures. The Board, however, identified important areas where DOE needed to be more thoroughly engaged in reviewing the adequacy and appropriateness of measures being taken immediately and in the future to address flooding concerns.</p>	
<p>LLNL Safety Basis Improvement. Extensive Board and staff reviews of LLNL's authorization basis for defense nuclear facilities have focused the Oakland Operations Office's attention towards nuclear safety and enhanced technical competence and the degree of involvement in the safety basis at LLNL. In response to the Board's reviews, there has been a substantial and continuing improvement of the LLNL Safety Basis program, including improvements in technical competence, training, and quality of safety basis documents.</p>	

Examples of FY 2000 Accomplishments

Readiness to Dispose of a Damaged Nuclear Weapon at the Nevada Test Site. The Board highlighted to DOE that 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, DOE has developed a project to upgrade its capabilities to conduct these activities safely. DOE has conducted a number of exercises that clearly identified issues needing to be addressed. The drills and exercises have already improved DOE's proficiency in this important mission area. Under the Board's continued oversight, DOE is now prioritizing its infrastructure upgrade needs.

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 1999 Accomplishments

DOE Standard on Hazards Analysis Reports. In early 1999, in response to a Board Recommendation, DOE developed and published a standard on conducting and documenting hazards analyses for nuclear explosive operations. This important directive sets DOE's fundamental expectations and provides guidance on how to establish and document the safety basis that ensures hazardous activities involving nuclear explosives can be completed safely.

Lightning Protection at Pantex. The Board and its staff continued efforts during the last year to help DOE address the potential hazards from lightning to nuclear explosive operations at Pantex. This year, the DOE lightning protection project team (which was established in response to a Board reporting requirement) completed a comprehensive investigation and report detailing the threat of lightning to nuclear explosives, analyzing potential controls and mitigators, and summarizing the actions DOE considers necessary to protect nuclear explosive operations at Pantex from lightning threats. During this same time, DOE has identified and installed many additional lightning protective measures at the plant.

Chemical Safety. Based on evaluations from its staff, the Board concluded that efforts to improve chemical safety at the Oak Ridge Y-12 Plant were not keeping pace with other defense nuclear sites or the Secretary of Energy's published expectations. After the Board communicated its concern, DOE stepped up efforts to complete a chemical management program at Oak Ridge Y-12, including a renewed commitment to characterize chemical inventories for emergency planning purposes and to dispose of excess chemicals.

Safety Controls for Specific Nuclear Explosive Operations. The Board and its staff conducted numerous assessments of the safety of specific nuclear explosive activities at the Pantex Plant in the last year. These reviews, which included the W56 dismantlement, the W87 Life Extension Program, and the W62 surveillance program, identified safety-related issues such as the adequacy of safety analyses and controls, the flowdown of controls into operating-level procedures, and the readiness of activities to operate safely. As a result of the Board's involvement, DOE has taken positive action to improve the safety of all of these operations.

Integrated Safety Management at Pantex. In early FY 1999, the Board issued Recommendation 98-2, *Integrated Safety Management at the Pantex Plant*, urging DOE to take fundamental actions to improve the safety of all weapons-related work at the Pantex Plant. Principle among the Board's specific recommendations was that DOE simplify and expedite its process for re-engineering processes at Pantex such that the attendant safety improvements could be put in place sooner. DOE accepted Recommendation 98-2 and made specific commitments to improve safety management at Pantex including accelerating efforts to establish weapon-specific safety basis for all on-going activities at Pantex.

Enriched Uranium Restart at Y-12. The Board and its staff evaluated DOE efforts to resume enriched uranium operations at the Oak Ridge Y-12 Plant. In the last year, the Board identified to DOE several safety issues with the Phase A2 resumption project including design problems, safety analysis problems, and problems with implementation of safety controls. The Board and DOE worked cooperatively to resolve these issues such that Phase A2 operations could resume safely to support high priority national defense related missions.

B332 Restart. After a Board letter in December 1997 identifying weaknesses in work planning, authorization and control in Building 332, Plutonium Facility, the Board interacted with Lawrence Livermore National Laboratory and the Department of Energy throughout Building 332's Resumption of Operations in 1998 and 1999 to encourage and assist with the improvements. As a result, Building 332 implemented a process to plan, authorize and control work with special nuclear material safety. With the Board's encouragement the process has been applied to the other facilities in the Superblock, i.e., Tritium Facility and Hardened Engineering Test Building. The Laboratory is revising site implementing guidance on planning, authorizing and control work to address a laboratory-wide systemic problem.

Examples of FY 1999 Accomplishments

Integrated Safety Management at LLNL. As a result of the Board's effort to improve safety management at DOE defense nuclear facilities (Recommendation 95-2), LLNL developed a set of Work Smart Standards (a set of requirements and standards for hazards specifically applicable to LLNL), is making significant progress with developing a description of its integrated safety management system, and is developing site-wide standards/guidance to implement an integrated safety management system. Through direct Board interaction, Board letters, and Board staff visits and reviews, the Board has provided assistance with developing the Work Smart Standards and to the Laboratory's efforts to develop policy and guidance to implement integrated safety management.

Y2K at LLNL. Based on staff reviews at Lawrence Livermore National Laboratory and other sites, the Board determined the DOE had provided inadequate direction to the operators of its defense nuclear facilities with regard to evaluating safety-related systems for year 2000 compliance. The Board communicated its concern to DOE in a letter requesting that DOE report on the status of safety-related equipment evaluations at all defense nuclear facilities. In April 1999, DOE issued detailed guidance on the evaluation of safety-related systems, requiring those systems be treated in a manner similar to mission-essential systems.

Los Alamos National Laboratory Pajarito Laboratory. The Board and its staff identified deficiencies with the safety basis for activities conducted at the Pajarito Laboratory (also known as TA-18). The Board assisted DOE and the lab in defining a path to improve the safety basis including urging that DOE focus on Basis for Interim Operations to upgrade the safety controls at Pajarito Laboratory as soon as possible.

Damaged Nuclear Weapons. The Board has recently focused attention on the issue that DOE's capability to safely perform the work necessary to dispose of damaged nuclear devices (DNDs) at defense nuclear facilities is rapidly disappearing. In the past, maintenance of the facilities and personnel necessary to support this mission depended on nuclear test operations. However, the personnel and facility infrastructure required to support testing operations are dwindling over time. Planning DND operations so that they can be executed safely represents challenges that DOE is not addressing. DOE has agreed with the Board's conclusions and is starting to increase its efforts to address this issue.

**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.

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.

FY 2004 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 completion of a 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*, and followup on the study's findings.
- Stabilization and disposal of plutonium-bearing residues at LANL (Recommendation 94-1/2000-1).
- Resolution of safety issues and startup of the plutonium-238 scrap recovery line at LANL.
- 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.
- Preparations for neptunium solution stabilization at the SRS (Recommendation 94-1/2000-1) and preparations to store the stabilized material at the Y-12 National Security Complex (Y-12).
- Characterization, stabilization, and packaging of uranium-233 (²³³U) 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.
- High-level waste storage tank integrity at SRS and the Hanford Site.
- Startup and initial operations of the Melton Valley transuranic/alpha waste treatment facility at Oak Ridge National Laboratory (ORNL).
- Safety of spent nuclear fuel and sludge retrieval, treatment, and storage at the Hanford Site (Recommendation 94-1/2000-1).
- Preparations for remote-handled transuranic waste operations at the Waste Isolation Pilot Plan (WIPP), and safety of full-throughput contact-handled waste disposal at WIPP.
- Design and construction of a dry storage facility for cesium and strontium capsules at the Hanford Site.
- Safety of contact-handled transuranic waste retrieval at the Hanford Site.
- Startup and initial operation of the Advanced Mixed Waste Treatment Facility at Idaho National Engineering and Environmental Laboratory (INEEL).
- Design of High-Activity Treatment Facility for transuranic waste at the Savannah River 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 ²³³U (i.e., ²²⁹Th extraction) for potential medical applications.
- Decommissioning activities in Building 371 at Rocky Flats Environmental Technology Site (RFETS).
- Demolition of Building 776 at RFETS.
- SRS deactivation activities, including F-Canyon and M-Area facilities.
- Hanford Site decommissioning activities (e.g., planning at the Plutonium Finishing Plant).
- Decommissioning at the Miamisburg Closure Project.
- Decommissioning at the Fernald Closure Project, including the design and startup of 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 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.

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

Examples of FY 2003 Accomplishments

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.

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.

Examples of FY 2002 Accomplishments

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 towards 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

Examples of FY 2001 Accomplishments

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.

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 2000 Accomplishments

Improved Remediation Schedules for Legacy Materials. On January 4, 2000, the Board issued Recommendation 2000-1 to ensure that the stabilization of legacy materials continues in a manner that reflects the risks posed by the materials. Additionally, the Board recommended that funding shortfalls preventing timely stabilization of materials be identified and reported as required by law. On June 8, 2000, DOE submitted a revised implementation plan intended to satisfy both Recommendation 94-1 and 2000-1. According to the plan the vast majority of remaining material will be stabilized within the next several years. Outstanding issues relating to material stabilization were communicated to DOE in a letter from the Board dated July 14, 2000.

In accordance with the Implementation Plan for Board Recommendation 94-1 and the US District Court of Idaho Court Order, all spent nuclear fuel was removed from the unlined basins at the Idaho National Engineering and Environmental Laboratory CPP-603 Fuel Receiving and Storage Building to a newer fuel storage facility (CPP-666) by April 28, 2000. Transfer of the fuel reduces the risk of leakage of radioactive materials from deteriorating spent fuel in unlined basins and is the first step towards drying and encapsulation of the spent fuel in dry storage facilities for the longer-term.

Standards for Safe Storage of Fissile Materials. In July 2000, DOE issued a standard for stabilization and packaging of uranium-233 metals and oxides for safe long-term storage. This standard was developed in response to Board Recommendation 97-1, with the Board working closely with DOE during its development to ensure that it contained appropriate requirements for safely storing this highly radioactive isotope. The Board also continued to assist DOE in refining a similar standard for safe packaging and storage of plutonium, which had been finalized and issued in response to Board Recommendation 94-1. In early 2000, after extensive review and discussions with DOE, the Board agreed to modifications to the plutonium standard that would make it easier to implement without compromising safety.

Engineered Safety Controls. In several reviews of new operations at the Savannah River Site, the Board identified inadequacies in the use of engineered controls to prevent potential accidents. As a result, improved controls were implemented for high-level waste retrieval activities. The Board is pursuing similar improvements in the design of the equipment for pretreatment and vitrification of highly radioactive americium/curium solutions at Savannah River. The Board is continuing to press DOE to address the root cause of these problems, and to reaffirm the importance of avoiding an undue reliance on administrative controls and non-safety-grade equipment.

Implementation of Radioactive Waste Management Order. In response to Board Recommendation 94-2, DOE has revised and reissued its radioactive waste management order, Order 435.1, to provide more comprehensive and effective requirements. The Board discovered this year that DOE had informed the operating contractor at Rocky Flats that several key provisions of the order did not apply to Rocky Flats on the grounds that it was not considered an operating facility. The Board acted immediately to correct this problem, ultimately issuing formal correspondence that led DOE to reverse this inappropriate interpretation before it spread to other sites.

Safe Storage of High-Level Waste. In June 2000, the Board's staff completed a review of high-level waste tank systems at the Hanford Site. Several significant issues were identified related to preserving the integrity of the storage tanks, notably the need to promptly correct the chemistry in tanks that had become depleted of corrosion inhibitors and the need to ensure the operability of ventilation systems required to prevent moisture from forming between the walls.

Efforts to Improve Decommissioning Work at the Hanford 233-S Facility. The Board's staff has monitored the planning and accomplishment of decommissioning work at the Hanford 233-S Plutonium Concentration Facility. Board correspondence and staff comments to DOE and its contractor regarding this facility have focused on work planning and implementation deficiencies. Safety deficiencies involving the work site and Process Hood glove bags noted by the staff have been discussed with project personnel, and corrective actions were taken to resolve some concerns. The staff has noted that efforts are being made to improve work planning and implementation. For

Examples of FY 2000 Accomplishments

example, the contractor held a workshop to review the radiological work planning process and provide recommendations for improvement, and a contractor project manager requested that a team of contractor and DOE health physicists inspect glove bags used in Process Hood decommissioning work.

Upgraded Work Controls for Decommissioning at Rocky Flats. The Board has followed dismantlement work activities for gloveboxes and other equipment in Building 771 (the former Plutonium Recovery Facility) at the Rocky Flats Environmental Technology Site (RFETS) and has issued correspondence noting problems with work planning and control. The staff reviewed the implementation of the RFETS Integrated Work Control Program (IWCP) and provided comments to RFETS personnel. The contractor revised the IWCP manual and has taken steps to improve the implementation of the program. This action has contributed to addressing the staff's observations of deficient implementation of the hazard analysis process for deactivation and decommissioning activities in facilities such as Building 771.

Upgraded Safety Controls for Decommissioning Work at Rocky Flats. The Board's staff has followed RFETS' efforts to apply engineered controls for size reduction of gloveboxes and other equipment in response to comments provided by the Board. These controls will help remove or greatly reduce the radioactive airborne environment. The staff has continued to communicate the need to mitigate or eliminate hazards by the use of engineered controls, and RFETS personnel are actively pursuing a phased approach of design, testing, and implementation of engineered controls in support of their site closure work.

New and Revised Procedures for Decommissioning Work at the Miamisburg Environmental Management Project. The Board's staff reviewed and provided comments regarding a draft technical basis document, new and revised implementing procedures, and plans for determining readiness for decommissioning work involving special tritiated compounds at the Miamisburg Environmental Management Project (MEMP). These comments contributed to improving the documents. Various work control documents have been reviewed, and staff comments have been provided to DOE-MEMP and the contractor. Staff-to-staff discussion is expected to help better identify and resolve deficiencies.

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 1999 Accomplishments

Improved Remediation Schedules for Legacy Materials. In December 1998, after numerous formal and direct interactions with the Board and its staff, DOE issued an up-to-date plan and schedule for addressing the numerous health and safety risks posed by the highest priority legacy materials stored throughout the DOE nuclear weapons complex, originally identified by the Board in Recommendation 94-1. However, the Board identified several deficiencies in the new plan, and soon thereafter discovered that site-level planning did not support several significant commitments. The Board has engaged DOE on these issues, and will see that they are resolved expeditiously.

Operational Problems at Savannah River Site. In the spring of 1999, the Board's continuing review of operational data for DOE defense nuclear facilities revealed a negative trend in control of work and operations at the Savannah River Site. The Board issued a letter to DOE in May 1999 identifying this problem to DOE, stating that a broader look at the underlying causes and a systematic understanding of those causes would be required to correct weaknesses in performance. In response, DOE has undertaken corrective actions to reverse this trend and ensure a sustained, highly satisfactory level of performance.

Completion of Recommendation 94-3 at Rocky Flats. The Board issued Recommendation 94-3, *Rocky Flats Plutonium Storage*, to ensure that the large quantity of plutonium at the Rocky Flats Environmental Technology Site would be safely stored. The Board recommended that DOE take a systematic approach to evaluating the suitability of Building 371 for the proposed new mission of storing the site's entire plutonium inventory, and prepare a program plan for building upgrades and improvements consistent with the building's mission. As a result of the Board's recommendation, upgrades to the building's structure, systems, and components, as well as the safety basis, were completed during Fiscal Year 1999. The Board closed this recommendation and now considers the building adequate for its current storage mission.

Characterization and Safety of Hanford High-Level Waste Tanks. The Board and its staff have continued to press DOE to resolve the health and safety issues presented by the 177 high-level waste tanks at Hanford. In 1999, the Board worked closely with DOE to develop a strategy for resolving the remaining safety-related uncertainties in the characterization of the wastes, and to ensure that DOE developed a sound strategy for mitigating flammable gas retention problems in Tank 241-SY-101. Because of these efforts, Board Recommendation 93-5, dealing with Hanford high-level waste characterization, is expected to be closed shortly, and the Board expects that DOE will be able to resolve the Tank 241-SY-101 problem in FY 2000.

Upgraded Safety Controls for Decommissioning at Rocky Flats. Decommissioning activities are being conducted in several buildings at the Rocky Flats Environmental Technology Site (RFETS). The Board identified that safety controls for protection of workers did not provide the desired level of protection because of an inappropriate reliance on personal protective equipment (e.g., respirators) rather than engineered controls to eliminate or mitigate hazards. Furthermore, when engineered controls were used (e.g., air movers), they were not adequately analyzed to ensure that they produced the desired result. In response to these concerns, a multi-disciplinary team was chartered at RFETS to develop more rigorous engineered controls and analyze performance of the controls. Enhanced worker protection controls are now being applied to demolition of contaminated equipment at the site. RFETS is also investigating the use of remote equipment for size reduction of contaminated equipment.

Activity Level ISM of Hanford Decommissioning Work. The Board's staff reviewed planning and implementation of decommissioning work being done by the Hanford Environmental Restoration Contractor. The staff found that the work control procedures and practices need improvement to meet the intent of Integrated Safety Management. 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 of needed improvement have been communicated directly to DOE.

Examples of FY 1999 Accomplishments

Radiation Protection Measures for Metal Tritides during Decommissioning. During FY 1999, the Board's staff evaluated radiation protection program measures for decommissioning work in areas at the Miamisburg Environmental Management Project (MEMP) that are suspected of being contaminated with tritium compounds such as metal tritides. As a result of staff visits and subsequent information exchanges, the MEMP contractor prepared a corrective action plan to address deficiencies in the radiation protection program, and work is proceeding to resolve these issues before major decommissioning work begins in mid-September 1999. These technical issues also apply to other defense nuclear facilities, so the Board has requested that DOE articulate a technical position on this matter to ensure that appropriate measures are implemented across the defense nuclear facilities complex. As a result of this action, DOE-EM informed DOE Field Offices of the issue, drafted a technical position regarding control levels for airborne radioactivity, and has committed to developing an updated technical approach.

**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.

This Performance Goal is new in FY 2004. Although the Board has reviewed the designs of new and modified DOE defense nuclear facilities since its inception, the pace of such activity within DOE this year and projected in the near term has led the Board to place increased emphasis on this goal. The representative accomplishments pertaining to this Performance Goal for FY 1999 - 2002 have been sorted for inclusion in this section of Appendix D.

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 2005 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. Candidates for review include:

- Review the design of potential modifications to existing Savannah River Site (SRS) processing facilities to support plutonium disposition activities.
- Evaluate the design of modifications to existing SRS facilities to support potential plutonium disposition activities.
- Review the design of modifications to existing SRS facilities to increase long-term plutonium storage capacity and provide long-term restabilization/repackaging capability.
- Review the design of the 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).
- Review the design of Oak Ridge National Laboratory's system for processing ^{233}U (i.e., ^{229}Th extraction) for potential medical applications.
- Continue design and construction reviews of the Waste Treatment Plant at the Hanford Site and the Highly Enriched Uranium Materials Facility at the Y-12 National Security Complex. Topics to review may include: pretreatment feed evaporation, ultra-filtration, and ion exchange systems, vitrification facilities off-gas and off-gas control systems, hydrogen mitigation and pulse jet mixing design bases, and construction quality.

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.

FY 2004 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. Candidates for review include:

- Review the design of modifications to existing Savannah River Site (SRS) facilities to support potential plutonium disposition activities.
- Assess the implementation of quality assurance requirements during Tritium Extraction Facility construction and procurement of safety significant facility equipment and systems.
- Review the design of modifications to existing SRS facilities to increase long-term plutonium storage capacity and provide long-term restabilization/repackaging capability.
- Evaluate the design of treatment facilities for high-level waste liquids and salts at SRS, and system improvements to ensure safe management of SRS high-level waste (Recommendation 2001-1).
- Design and construction of a dry storage facility for cesium and strontium capsules at the Hanford Site.
- Review the design of High-Activity Treatment Facility for transuranic waste at SRS.
- Evaluate the adequacy of DOE's Title II design of the final proposed Pit Disassembly and Conversion Facility at SRS.
- Continue design and construction reviews of the Waste Treatment Plant at the Hanford Site and the Highly Enriched Uranium Materials Facility at the Y-12 National Security Complex. Topics to review may include: pretreatment feed evaporation, ultra-filtration, and ion exchange systems, vitrification facilities off-gas and off-gas control systems, hydrogen mitigation and pulse jet mixing design bases, and construction quality.

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 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 5 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 its 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. 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.

Examples of FY 2003 Accomplishments

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.

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

Examples of FY 2002 Accomplishments

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.

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 2000 Accomplishments

Pantex Fire Protection. The Board and its staff highlighted to DOE senior management that the fire detection system at Pantex was failing because the commercial vendor had stopped producing spare parts. The review also identified that the fire suppression capability of the cells in one Building lagged behind that in other nuclear explosive operating facilities because they did not have ultra-violet detectors to initiate suppression. As a result of the Board's actions, a major part of the supplemental appropriation from DOE to Pantex will be used to install a UV detection system to activate the deluge system in the cells, greatly improving the fire safety of explosive operations in the area. Additionally, DOE has started plans (in response to Recommendation 98-2) to accelerate replacement of the fire detection system with a non-proprietary system supported by many different commercial vendors.

LLNL Electrical and I&C. Based on reviews by the Board's staff of LLNL's electrical, instrumentation, and control systems, the Board concluded that the safety-class emergency power system at LLNL's plutonium facility (Building 332) was neither designed nor maintained to safety-class standards. The staff report also noted potential areas for improvement, particularly LLNL's Work Smart Standards for safety-related instrumentation and control systems and lightning protection for Building 332. In response, LLNL took prompt actions to address the Board's issues such as correcting improper seismic mounts for safety-critical electrical components and switchgear.

LANL Classified Experiment. Board interactions with LANL have led to the formation of a group of experts to thoroughly review a classified experiment with potentially significant safety consequences and are significantly improving the quality of safety controls. The expert panel has been conscientiously evaluating the complicated activity and has identified numerous improvements that LANL has implemented (or is working on) that substantially improve the safety of this experiment and the design and safety basis for similar experiments potentially conducted in the future.

Tritium Extraction Facility. Review of the preliminary design package for the Tritium Extraction Facility (TEF) project by the Board and its staff disclosed that the preliminary design did not appear to have fully implemented the hierarchy of safety controls consistent with the site's manuals of practice, and that additional consideration of this matter was merited in developing the final TEF design. For example, there appeared to be an over-reliance on administrative controls being used instead of engineered design features to provide safety functions. DOE accepted the Board's suggestions and agreed to incorporate them in the final design.

Hanford Spent Nuclear Fuel Project. Reviews of the Hanford Spent Nuclear Fuel Project by the Board's staff identified safety issues related to safety-related ventilation systems and electrical systems at the Cold Vacuum Drying Facility. DOE addressed these issues, including addition of a diesel generator to supply safety significant power to the exhaust fans for the ventilation system, further enhancing the safety of the facility.

Pit Disassembly and Conversion Facility. The Board and its staff conducted a series of review meetings on the design of the Pit Disassembly and Conversion Facility (PDCF) that identified to DOE a need for additional boreholes in the geotechnical specification to improve safety; DOE added a requirement for these boreholes to the specification. In addition, the Board noted that sand filters provide better inherent resistance to severe accidents than do high efficiency particulate air (HEPA) filters. In response, DOE committed to conduct a comprehensive study to compare the safety and cost benefits of the sand filter option with the HEPA filtration option.

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 1999 Accomplishments

The Board conducted a series of design review meetings with DOE and its contractor for the Tritium Extraction Facility (TEF) at SRS, which resulted in the Board's identifying a number of issues. The preliminary facility design did not appear to have fully implemented a hierarchy of safety controls consistent with what is considered good safety practice. The Board also identified additional design features that would enhance safety by improving the reliability of the controls and providing additional defense in depth without a significant impact on the cost and schedule for the project. These issues were communicated to DOE during reviews.

At the Board's urging, the Hanford Spent Nuclear Fuel Project (SNFP) contracted for new containers for storing spent nuclear fuel. The containers are to be code stamped to the requirements of Section III of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, thus providing enhanced reliability for safely storing spent nuclear fuel.

The Board's reviews identified several incidents that indicate a breakdown in weld quality assurance associated with design and construction projects at DOE sites, including the Hanford Site, the Y-12 Plant, and INEEL. Such a breakdown in weld quality assurance could have allowed components with defective welds to be put into service in systems where weld failure could adversely affect the health and safety of workers and the public, or result in contamination of the environment. The Board issued a letter requesting DOE to identify steps it will take to resolve this problem.

PERFORMANCE GOAL 4: NUCLEAR PROGRAMS AND ANALYSIS

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

OUTCOME: DOE will have acknowledged, acted upon, and/or resolved the health and safety issues raised by the 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.

Performance Goal 4

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

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 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 2004 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 25 DOE directives that may impact public and worker health and safety will require review, of which 2 or 3 are likely to require significant Board and staff interaction to ensure satisfactory resolution of potential issues. The Board also expects to be heavily involved in the efforts of the National Nuclear Security Administration (NNSA) to establish its own directive system. It is estimated that 20 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.
- 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 of DOE's *Quality Assurance Improvement Plan*.
- 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 continue its initiative to identify the potential issues associated with DOE's and NNSA's new policies on line oversight and contractor assurance. The Board anticipates that this effort will require 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 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

Examples of FY 2003 Accomplishments

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.

Nuclear Criticality Safety Program. The Board continued to stress the need for stable funding for future nuclear criticality safety program elements, particularly when funding available in FY 2003 was cut from programmed levels. Throughout 2003, the Board conducted a comprehensive review of the results obtained through DOE's implementation of the Board's Recommendation 97-2, *Continuation of Criticality Safety at Defense Nuclear Facilities*. As a result, in August 2003, the Board determined that nuclear criticality safety has improved across the complex and closed the recommendation, levying an annual reporting requirement on DOE that will allow the Board to maintain the required level of oversight on this key area.

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.

Examples of FY 2003 Accomplishments

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.

Nuclear Criticality Safety at the Pit Disassembly and Conversion Facility (PDCF). The Board conducted a series of reviews on the design of the controls for nuclear criticality safety for the proposed PDCF. The design included a unique safety control system involving numerous measurements of weight and radiation signatures throughout the process. The Board urged DOE to take advantage of the expertise available in DOE's Nuclear Criticality Safety Support Group, which is composed of senior criticality specialists. Their review highlighted significant potential issues based on their experiences with the development and operation of similar critical mass control systems. These issues are now being addressed.

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.

Examples of FY 2003 Accomplishments

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, although DOE has again proposed rescinding the funds in FY 2004.

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 needed improvement. As a result of the Board's efforts, DOE is working to institutionalize these reviews and to ensure that the federal and contractor workforce is adequately trained and qualified so that the vital safety systems remain reliable and operational in the future.

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. 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.

<p>Performance Goal 4</p>	<p>Nuclear Programs and Analysis. DOE develops, maintains, and implements regulations, requirements, and guidance; and establishes and implements safety programs at defense nuclear facilities as necessary to ensure adequate protection of health and safety of the workers and the public.</p>
<p>Examples of FY 2002 Accomplishments</p>	
<p>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:</p> <ul style="list-style-type: none"> • 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, <i>Software Quality Assurance</i>. 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, <i>Facility Representative Functional Area Qualification Standard</i>). 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 the latter part of 2002, the Board's staff provided comments on DOE's draft order on emergency management, DOE O 151.1B, <i>Comprehensive Emergency Management System</i>. 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. <p>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, <i>Configuration Management, Vital Safety Systems</i>. 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 and the Board is conducting a series of reviews at Y-12, Pantex, Hanford, and the Lawrence Livermore National Laboratory to evaluate the quality and effectiveness of the programs.</p> <p>Federal Technical Oversight of Safety Systems. In Board Recommendation 2000-2, <i>Configuration Management, Vital Safety Systems</i>, 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 continued to engage DOE as they recruit, train and qualify federal employees for oversight of the vital safety systems.</p> <p>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</p>	

Examples of FY 2002 Accomplishments

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.

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*. In a letter dated January 31, 2002, the Board noted that many constructive steps had been taken to establish a disciplined process for responding to DOE independent oversight findings. However, additional effort was warranted in the establishment of Functions, Responsibilities, and Authorities documents in a number of DOE organizational elements. As a result of the Board's concerns, DOE program offices are revising their FRA documents to ensure safety roles and responsibilities are clearly defined.

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.

Examples of FY 2002 Accomplishments

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 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.

Special Tritium Compounds. The Board's April 29, 1999 letter requested information regarding DOE's approach for a radiation protection program for work involving special tritium compounds (STCs) such as metal tritides and organically bound tritium. During the last two years, DOE has conducted technical evaluations, drafted guidance, and developed a documented approach that provides an adequate basis for protecting workers, the public, and the environment from exposure to STCs. A more formal and institutionalized radiation protection approach is expected to be made through an amendment to 10 CFR Part 835, *Occupational Radiation Protection Rule* and the issuance of DOE guidance documents.

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 Board's 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.

Examples of FY 2001 Accomplishments

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 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.

Examples of FY 2001 Accomplishments

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 initial reviews of priority facilities and conducted detailed pilot reviews of confinement ventilation systems at two facilities.

Performance Goal 4

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

Examples of FY 2000 Accomplishments

Environment, Safety, and Health Directives. The Board and its staff provided substantive comments to DOE during the review process for 44 directives associated with, but not limited to, integrated safety management, chemical safety, nuclear explosive operations, and technical personnel training and qualification. At year's end, both staffs were completing resolution of issues on several remaining directives to improve the content, clarity, and consistency in safety guidance:

- The Board and its staff provided comments to DOE during the review process on the draft *Chemical Management Handbook*. The preliminary draft was unacceptable, lacking proper integration with integrated safety management concepts. As a result of suggestions from the Board's staff, the rewritten handbook incorporates integrated safety management, the applicable DOE standards, and other government agency regulations to allow ease of contractor use.
- Following the issuance of DOE-DP-STD-3016-99, *Limited Standard, Hazard Analysis Reports for Nuclear Explosive Operations*, the Board's staff interacted directly with the Pantex contractor in preparing an Authorization Basis Manual that described in more detail the format and content of the Hazard Analysis Report, as well as the analytical process, in preparation for nuclear explosive operations. This will significantly improve the quality of the authorization basis for nuclear explosive operations including clear identification of the necessary safety controls.
- During 2000, DOE G 450.4-1, *Integrated Safety Management Guide* was revised to incorporate a major new section dealing with how to maintain a site's Integrated Safety Management system following initial implementation. Significant involvement of the Board and its staff was key to the development of the approach as well as the revision to DOE G 450.4-1. This new guidance will help to ensure the sites' ISM systems are maintained current and continue to improve.

Technical Competence. The Board continued to focus DOE's attention on the technical competence of federal workers as an essential safety element for defense nuclear facilities. Through a revised Implementation Plan for Board Recommendation 93-3, *Improving DOE Technical Capability in Defense Nuclear Facilities Programs*, a DOE formed panel of senior line managers continued to implement a corporate program to recruit, develop, deploy, and retain technical capability at defense nuclear facilities. Many changes in DOE's mission and infrastructure have occurred since the Board issued Recommendation 93-3. The Board believes that DOE's efforts in response to this recommendation have resulted in excellent programs and processes that will be invaluable in the training and qualification of the next generation of the DOE federal workforce. On November 9, 1999, the Board closed Recommendation 93-3:

- The Board and its staff continued to engage DOE in regard to the development of formal training and qualification for federal and contractor criticality safety personnel resulting in the upgrade of DOE Order 420.1, *Facility Safety*, emphasizing this important aspect of criticality safety. Also, in response to Board staff concerns about the floor presence of criticality engineers, DOE directed that criticality engineers increase the number of hours spent observing work on the floor, and report these hours to headquarters and program offices responsible for the site.
- The Board and its staff continued to interact directly with cognizant DOE representatives to ensure a satisfactory path to closure of Board Recommendation 97-2, *Continuation of Criticality Safety at Defense Nuclear Facilities*, especially with regard to the development of an adequate curriculum and the criticality safety training of sufficient numbers of contractor and federal employees.
- Working closely with the Board and its staff, DOE has upgraded DOE Order 360.1A, *Federal Employee Training*, and DOE-STD-1063-2000, *Facility Representatives*, as elements of the revised Implementation Plan for Board Recommendation 93-3, *Improving DOE Technical Capability in Defense Nuclear Facilities Programs*. DOE further institutionalized its technical personnel processes with the issuance of DOE M 426.1-1, *Federal Technical Capability Manual*.
- The Board emphasized the vital importance that a technically-competent workforce plays in ensuring public and worker health and safety.

Examples of FY 2000 Accomplishments

Fire Protection. The Board prepared and issued DNFSB/TECH-27, *Fire Protection at Defense Nuclear Facilities*, setting forth principles and good practices for enhancing the reliability of DOE's complex-wide fire protection program.

Y2K Issues. The Board's staff review of DOE's Y2K Program identified issues related to the evaluation of the safety related systems for year 2000 compliance. Programmatic issues at Los Alamos and Lawrence Livermore National Laboratories remained until the Fall of 1999 and required subsequent staff followup in late 1999. Following the improvement in DOE's Y2K program, there were no significant failures of safety-related systems at the calendar year turnover.

Integrated Safety Management. The Board continued to emphasize the need for Integrated Safety Management across the defense nuclear complex. Representative actions include:

- In response to numerous letters from the Board associated with Integrated Safety Management, DOE upgraded its Lessons Learned process, including issuing new guidance documents and development of a centralized web-based Lesson Learned database. DOE also issued a set of ISM performance indicators to provide senior DOE managers with measures of the effectiveness of ISM at their sites.
- In response to Board Recommendation 98-1, *Resolution of DOE Internal Oversight Findings*, DOE implemented a formal process for dealing with safety issues identified by DOE's internal independent oversight organization. This resulted in a clearly defined, systematic, and comprehensive process for addressing and resolving these safety issues.
- The Board's staff continued to critique all ISM verifications at defense nuclear facilities. These verification reviews are the processes DOE uses to evaluate the status of ISM implementation and are key to the DOE Field Managers' determinations that their sites have implemented ISM. Additional criteria for determining ISM implementation were issued by the Deputy Secretary in October 1999. The Board worked closely with DOE in defining these criteria and in evaluating DOE's efforts to implement ISM at all sites.

Performance Goal 4

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

Examples of FY 1999 Accomplishments

Environment, Safety, and Health Directives. The Board and its staff provided substantive comments to DOE during the review process for three health and safety directives associated with deactivation and decommissioning. After successfully resolving the Board's comments, DOE updated one of these directives. At year's end, both staffs were completing resolution of issues in the two remaining directives to improve content, clarity, and consistency of the guidance.

The Board's staff provided comments on thirteen draft implementation guides associated with 10 CFR 835, *Occupational Radiation Protection*, DOE-STD-1098-99, *Radiological Control Standard*, and two handbooks associated with the DOE radiological protection program. The staff then worked with the DOE staff to resolve the identified areas of needed improvement. By year's end, DOE had issued all thirteen implementation guides and both handbooks, and had sent the standard to the DOE Technical Standards Program for publication. These actions resulted in clarifying and strengthening DOE's guidance for this important safety management function.

The Board provided comments to DOE on a new guide on management of Quality Assurance, a new qualification standard for individuals engaged in criticality safety studies, and a new handbook addressing design considerations, all three of which are explicitly associated with integrated safety management. Through significant interaction between the Board's staff and their DOE counterparts, significant improvements in the content and clarity of the directives were achieved.

Technical Competence. The Board continued to focus DOE's attention on the technical competence of federal workers as an essential safety element for defense nuclear facilities. Through a revised Implementation Plan for Board Recommendation 93-3, *Improving DOE Technical Capability in Defense Nuclear Facilities Programs*, DOE formed a panel of senior line managers to implement a corporate program to recruit, develop, deploy, and retain technical capability at defense nuclear facilities. The panel members self-assessed the Technical Qualification Programs at their respective sites, and took the necessary actions to upgrade their plans and procedures. The panel also identified 686 critical technical positions and took administrative actions to preserve nearly all of these positions against downsizing efforts.

Significant accomplishments were made by DOE as a result of implementing Board Recommendation 97-2, *Criticality Safety*. Training and qualification programs for both DOE and contractor criticality engineers were established including high quality qualification standards. The operation of the Los Alamos National Laboratory critical facility was revamped for training of criticality safety engineers and for the development of intermediate range neutron energy data for critical assemblies. These activities provide vital information for understanding and characterizing the unique hazards and for developing proper safety controls related to nuclear criticality. Additionally, a website was developed for dissemination of archived data on the past 40 years of criticality experiments which will provide great benefit to the nuclear safety community.

Integrated Safety Management. Reviews by the Board and its staff identified shortcomings in the Hanford Spent Nuclear Fuel Project that included the continued lack of sound project management, despite several high level management changes; poor implementation of quality assurance requirements; and an inability to identify and resolve emerging technical issues in a timely manner. Continued Board and staff pressure through correspondence and face-to-face meetings has led to some progress on these concerns, but continuing attention is needed.

Several key indicators for gauging progress in implementing ISM have been identified from the Board's reviews: Incorporation of ISM-related Department of Energy Acquisition Regulation (DEAR) clauses into contracts, establishment of a mutually agreed-upon requirements base as the foundation for the ISM program, development of an ISM System description that describes how the contractor will integrate the system into work practices, performance of a DOE ISM verification review, and establishment of an authorization agreement. Each of these areas received Board attention in FY 1999, not only at the 10 priority facilities called out in the Recommendation 95-2 DOE Implementation

Examples of FY 1999 Accomplishments

Plan but also in the 43 facilities designated in the Board's December 1997 letter as "follow-on" facilities. During the FY 1999, DOE worked to fully implement ISM at the Recommendation 95-2 priority facilities. The Board monitored and advised on the development of DEAR Clause-required ISM descriptions, which describe how the contractor will integrate ISM into work practices. To date, all sites with priority or follow-on facilities have had their ISM descriptions approved by DOE, except Los Alamos National Laboratory, Lawrence Livermore National Laboratory, and the Pantex Plant, which are scheduled for approval by the end of the year. The Board also urged DOE to continue its efforts to define and operate to explicit control measures at the priority facilities, and enlarge its efforts to include all high and moderate hazard defense nuclear facilities. In his March 1999 memorandum on Safety-Accountability and Performance, the Secretary of Energy committed to having ISM completely in place for all DOE facilities by September 2000.

In response to the Board's March 20, 1998 reporting requirement on the DOE's Feedback and Improvement Program, DOE committed to upgrading the DOE Lessons Learned process, including developing guidance on improving the complex-wide feedback and improvement programs. In addition, DOE published a revised DOE acquisition regulation that will hold a contractor's fee at risk in the event of poor safety performance. The Secretary of Energy's March 3, 1999, memorandum on Safety-Accountability and Performance tasked the newly established DOE Safety Council with developing performance standards that will be used to hold federal personnel accountable for effective and timely ISM implementation. The Board worked closely with DOE in this effort.

The Board issued Recommendation 98-1 to address the internal independent oversight element of the feedback and improvement program that the Board felt was not being adequately addressed in DOE's feedback and improvement initiatives. The Board determined that DOE's independent assessments of safety management in the field were treated largely as advisories and follow-up actions became discretionary to lower levels of DOE line management. DOE accepted this Recommendation and provided an acceptable Implementation Plan, which addresses DOE's need for a clearly defined, systematic, and comprehensive process to address and resolve safety issues identified by internal independent oversight.

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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**Defense Nuclear Facilities
Safety Board
FY 2006 Congressional Budget Request**

APPROPRIATION & EXPENSE SUMMARY

(Tabular dollars in thousands.)

OPERATING EXPENSES

	ACTUAL FOR <u>FY 2004</u>	FINANCIAL PLAN FOR <u>FY 2005</u>	BUDGET REQUEST FOR <u>FY 2006</u>
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).

**Defense Nuclear Facilities
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FY 2006 Congressional Budget Request**

PERSONNEL SUMMARY

	<u>FY 2004 ACTUAL</u>	<u>FY 2005 FINANCIAL PLAN</u>	<u>FY 2006 BUDGET REQUEST</u>
Statutory Personnel Ceiling: (FTE's) ^{1/}	150	150	150
FTE Usage ^{2/}	97	100	100
<hr/>			
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.

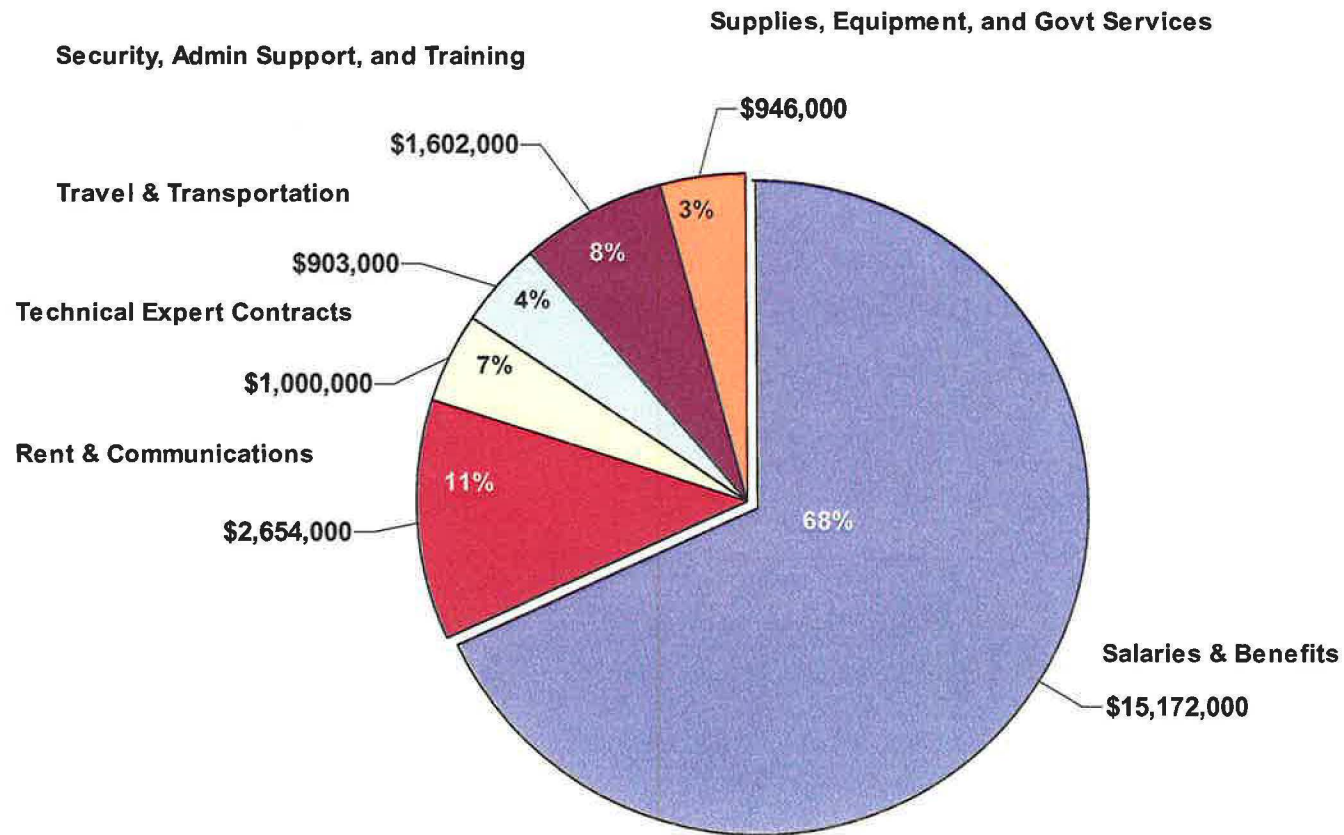
**Defense Nuclear Facilities
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PROPOSED APPROPRIATION LANGUAGE

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:

	<u>New Budget Authority</u>	<u>FTEs</u>	<u>Page Ref.</u>
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 <u>Authority</u>	<u>FTEs</u>	Page <u>Ref.</u>
Office space lease for DNFSB Washington, DC Headquarters	\$550,000		11
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.]			
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 device. 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%	<u>\$226,174</u>	<u>\$58,805</u>	\$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 than 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 device. 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	
<p>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).</p>	
<p>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).</p>	
<p>Representative areas for Board and staff review include:</p>	
<ul style="list-style-type: none"> • 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. 	
<p>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.</p>	

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	
<p>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).</p>	
<p>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).</p>	
<p>Representative areas for Board and staff review include:</p>	
<ul style="list-style-type: none"> • 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. 	
<p>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.</p>	

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.

<p>Performance Goal 1</p>	<p>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.</p>
<p>Examples of FY 2003 Accomplishments</p>	
<p>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.</p>	
<p>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, <i>Weapons Laboratory Support of the Defense Nuclear Complex</i>. 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.</p>	
<p>Storage of "Pits." Continuing to respond to the Board's Recommendation 99-1, <i>Safe Storage of Fissionable Material called "Pits,"</i> 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.</p>	
<p>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.</p>	
<p>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, <i>Safety Management at the Pantex Plant</i>. 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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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</p>	

Examples of FY 2003 Accomplishments

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	<p>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.</p>
Examples of FY 2002 Accomplishments	
<p>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.</p>	
<p>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.</p>	
<p>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 <i>Chemical Safety Management Program</i>, 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.</p>	
<p>Recommendation 99-1. Continuing to respond to Board Recommendation 99-1, <i>Safe Storage of Fissionable Material called "Pits,"</i> 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.</p>	
<p>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.</p>	
<p>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, <i>Life Cycle Asset Management</i>, 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.</p>	
<p>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.</p>	

Performance Goal 1	<p>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.</p>
Examples of FY 2001 Accomplishments	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>Recommendation 99-1. In response to Board Recommendation 99-1, <i>Safe Storage of Fissionable Material called "Pits."</i> 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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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, <i>Integrated Safety Management at the Pantex Plant</i>. 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.</p>	
<p>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.</p>	
<p>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</p>	

Examples of FY 2001 Accomplishments

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 ²³³U (i.e., ²²⁹Th 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	<p><u>Nuclear Material Processing and Stabilization.</u> 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.</p>
FY 2005 Performance Objectives	
<p>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, <i>Nuclear Safety Management</i>), the safety of ongoing operations, and the suitability of long-term storage and disposal facilities. Representative areas for review include:</p> <ul style="list-style-type: none"> • 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, <i>Study of Facilities for Storage of Plutonium Materials at Savannah River Site</i>. • 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 (²³³U) 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 Plant (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 ²³³U (i.e., ²²⁹Th 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	<p>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.</p>
Examples of FY 2004 Accomplishments	
<p>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.</p>	
<p>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.</p>	
<p>Surveillance and Monitoring Program for Plutonium Storage. DOE-STD-3013, <i>Stabilization, Packaging, and Storage of Plutonium-Bearing Materials</i>, 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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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</p>	

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

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

<p>Performance Goal 2</p>	<p><u>Nuclear Material Processing and Stabilization.</u> 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.</p>
<p>Examples of FY 2003 Accomplishments</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	

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.

<p>Performance Goal 2</p>	<p>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.</p>
<p>Examples of FY 2002 Accomplishments</p>	
<p>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.</p> <p>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.</p> <p>Uranium-233 Stabilization. In response to Board Recommendation 97-1, DOE commenced its ²³³U 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 ²³³U. The inner can of this package was severely corroded.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>	

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	
<p>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, <i>High-Level Waste Management at the Savannah River Site</i>. 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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>Uranium-233 Stabilization. In response to Board Recommendation 97-1, <i>Uranium-233 Safe Storage</i>, 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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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</p>	

Examples of FY 2001 Accomplishments

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.

<p>Performance Goal 3</p>	<p>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.</p>
<p>Examples of FY 2003 Accomplishments</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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 its intended storage mission, but new missions that increased the material at risk would require further evaluation.</p>	
<p>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.</p>	
<p>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.</p>	

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	<p><u>Nuclear Facilities Design and Infrastructure.</u> 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.</p>
Examples of FY 2002 Accomplishments	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	

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	<p><u>Nuclear Facilities Design and Infrastructure.</u> 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.</p>
Examples of FY 2001 Accomplishments	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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, <i>Safety Review of the Hanford Spent Nuclear Fuel Project During the Design and Construction Phase</i>, 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.</p>	

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	<p>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.</p>
FY 2006 Performance Objectives	
<p>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.</p>	
<p>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:</p>	
<ul style="list-style-type: none"> • 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, <i>Configuration Management, Vital Safety Systems</i>. • Implementation and effectiveness of ISM at defense nuclear facilities. 	
<p>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.</p>	
<p>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, <i>Oversight of Complex, High Hazard Nuclear Operations</i>, will have required significant Board and staff interaction with multiple federal and contractor agencies.</p>	
<p>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.</p>	

<p>Performance Goal 4</p>	<p><u>Nuclear Safety Programs and Analysis.</u> 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.</p>
<p>FY 2005 Performance Objectives</p>	
<p>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.</p> <p>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:</p> <ul style="list-style-type: none"> • 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 of Recommendation 2000-2, <i>Configuration Management, Vital Safety Systems</i>. • Implementation and effectiveness of ISM at defense nuclear facilities. <p>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.</p> <p>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.</p> <p>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.</p>	

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

Examples of FY 2004 Accomplishments

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.

<p>Performance Goal 4</p>	<p><u>Nuclear Safety Programs and Analysis.</u> 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.</p>
<p>Examples of FY 2003 Accomplishments</p>	
<p>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:</p> <ul style="list-style-type: none"> • 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, <i>Worker Protection Management for DOE Federal and Contractor Employees</i>. 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 <i>Electrical Safety Handbook</i> 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, <i>Environment, Safety and Health Reporting</i>, plus its many supporting documents, including DOE Manuals 231.1-1, 231.1-2, <i>Occurrence Reporting and Processing of Operations Information</i>, and DOE Guides 231.1-1, <i>Occurrence Reporting and Performance Analysis Guide</i>, and 231.1-2, <i>Occurrence Reporting Causal Analysis</i>. 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. <p>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.</p> <p>Software Quality Assurance: Considerable Board resources were expended during FY 2002 reviewing draft DOE Order 203.X, <i>Software Quality Assurance (SQA)</i>. 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, <i>Quality Assurance for Safety-Related Software</i>. 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, <i>Guidelines for the Verification and Validation of Scientific and Engineering Computer Programs for the Nuclear Industry</i>. This standard will be important to both the Nuclear Regulatory Commission (NRC) and DOE.</p> <p>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 <i>Integration of Multiple Hazard Analysis Requirements and Activities</i>, which has helped</p>	

Examples of FY 2003 Accomplishments

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

Examples of FY 2003 Accomplishments

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.

<p>Performance Goal 4</p>	<p><u>Nuclear Safety Programs and Analysis.</u> 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.</p>
<p>Examples of FY 2002 Accomplishments</p>	
<p>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:</p> <ul style="list-style-type: none"> • 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, <i>Software Quality Assurance</i>. 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, <i>Facility Representative Functional Area Qualification Standard</i>). 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, <i>Comprehensive Emergency Management System</i>. 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. <p>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, <i>Configuration Management, Vital Safety Systems</i>. 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.</p> <p>Federal Technical Oversight of Safety Systems. In Board Recommendation 2000-2, <i>Configuration Management, Vital Safety Systems</i>, 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.</p> <p>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</p>	

Examples of FY 2002 Accomplishments

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.

<p>Performance Goal 4</p>	<p><u>Nuclear Safety Programs and Analysis.</u> 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.</p>
<p>Examples of FY 2001 Accomplishments</p>	
<p>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.</p>	
<p>Nuclear Safety Rule. The "Nuclear Safety Rule" (10 CFR 830, <i>Nuclear Safety Management</i>) 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.</p>	
<p>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, <i>Nuclear Explosive and Weapon Surety Program</i>; and DOE Order 452.2B, <i>Safety of Nuclear Explosive Operations</i>. Both these Orders were issued in August 2001.</p>	
<p>Safety Management Functions, Responsibilities, and Authorities Manual. The Board reviewed a draft revision to DOE Manual 411.1-1B, <i>Safety Management Functions, Responsibilities, and Authorities Manual</i>, 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, <i>Nuclear Safety Management</i>.</p>	
<p>Contractor System Engineers. The Board provided significant comments to draft Change 4 to DOE Order 420.1A, <i>Facility Safety</i>, which is being revised to define requirements for contractor System Engineers in response to Board Recommendation 2000-2, <i>Configuration Management, Vital Safety Systems</i>. 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.</p>	
<p>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.</p>	
<p>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.</p>	
<p>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, <i>Configuration Management, Vital Safety Systems</i>. As a result, DOE has drafted a significant modification to DOE Order 420.1, <i>Facility</i></p>	

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
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*** 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

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)

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
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.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
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.

<u>CONTRACTOR</u>	<u>CONTRACT EXPIRATION DATE</u>	<u>DESCRIPTION OF WORK</u>
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

Briere Associates, Inc.

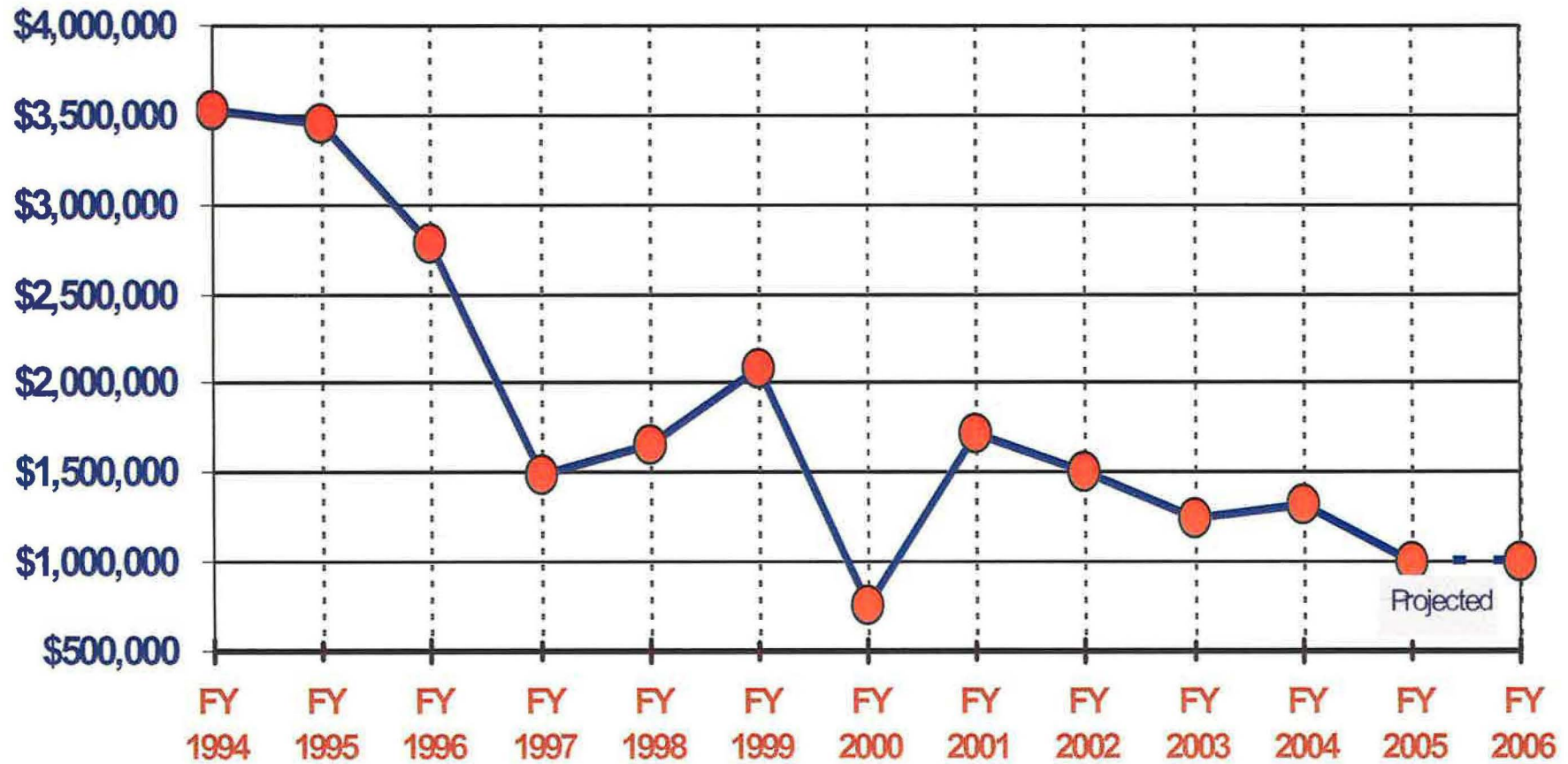
CONTRACT EXPIRATION DATE

09/30/05

DESCRIPTION OF WORK

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



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 SF of 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

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.