

FY 2003  
BUDGET REQUEST  
TO THE  
CONGRESS

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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 PROPOSAL **
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).

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**PERSONNEL SUMMARY**

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

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<sup>1/</sup> 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).

<sup>2/</sup> Includes 5 full-time Board Members.

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

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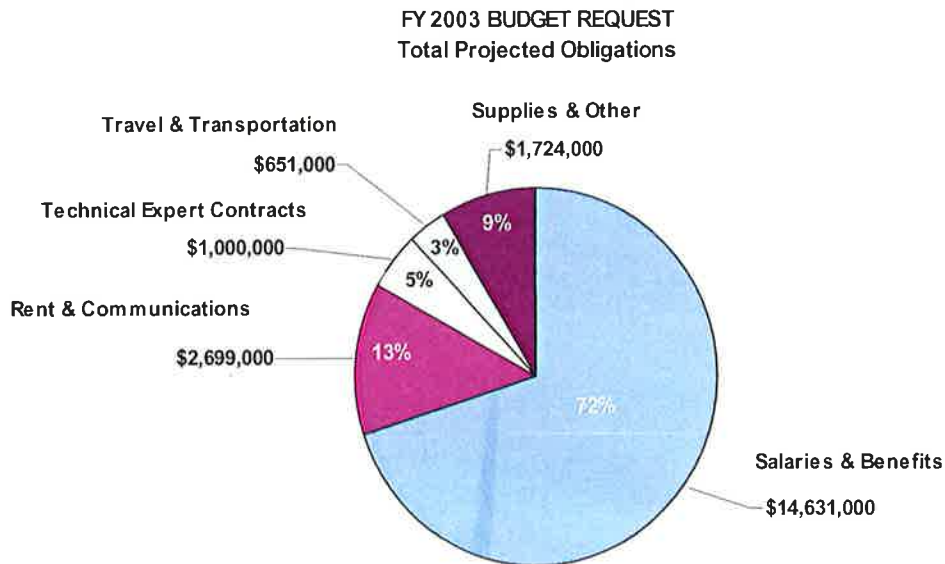
# Defense Nuclear Facilities Safety Board FY 2003 Congressional Budget Request

## 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](http://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. <sup>1</sup>*

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<sup>1</sup> National Defense Authorization Act for Fiscal Year 1991, Conference Report, H.R. Conf. Rep. No. 923, 101<sup>st</sup> Cong. 2<sup>nd</sup> 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
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
*** 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.

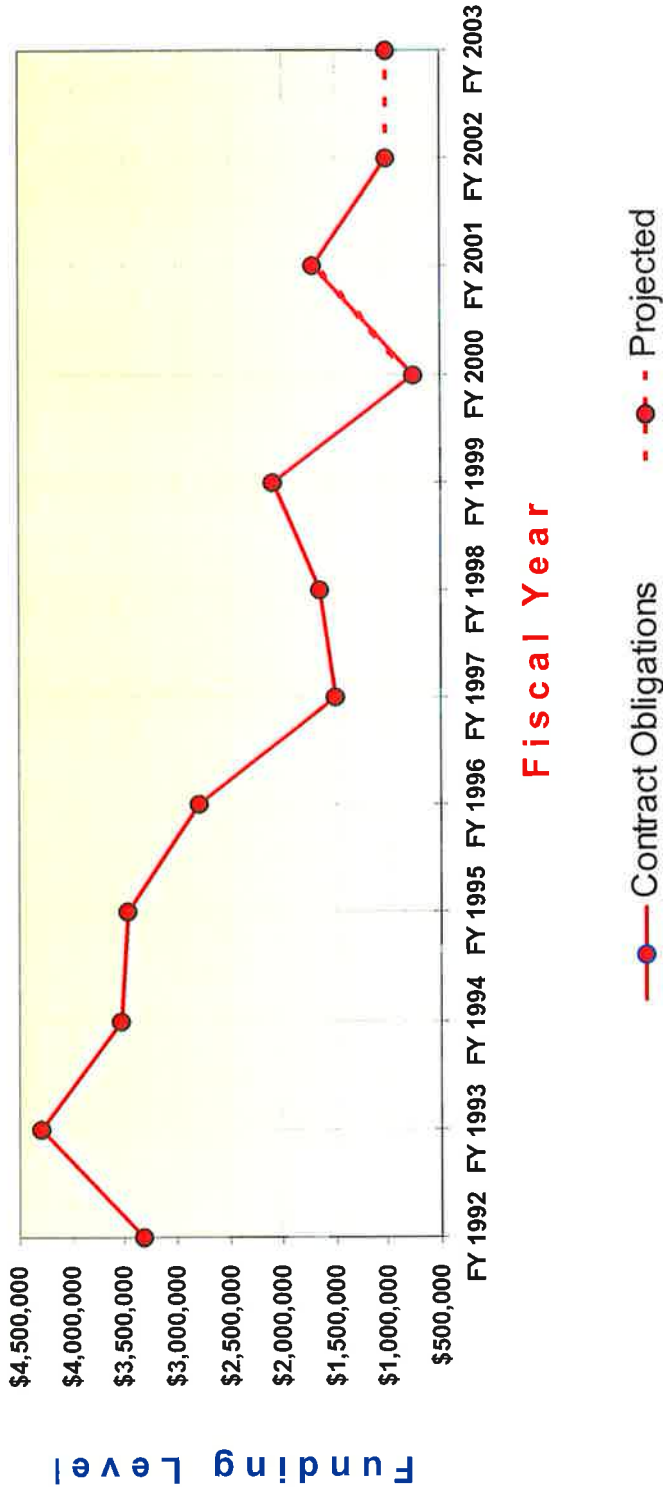
CONTRACT  
EXPIRATION  
DATE

DESCRIPTION OF WORK

CONTRACTOR

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; seismicological 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](http://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**

<p><b>Objective 1-A:</b></p>	<p><b>Improvement and Integration of Health and Safety Directives.</b> 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 style="text-align: center;"><b>Examples of FY 1999 Accomplishments</b></p>	
<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**

<p><b>Objective 1-A:</b></p>	<p><b><u>Improvement and Integration of Health and Safety Directives.</u></b> 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><b>Examples of FY 2000 Accomplishments</b></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>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**

<p><b>Objective 1-A:</b></p>	<p><b>Improvement and Integration of Health and Safety Directives.</b> 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 style="text-align: center;"><b>Examples of FY 2001 Accomplishments</b></p>	
<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><b>Nuclear Safety Rule.</b> 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><b>Safety of Nuclear Explosive Operations.</b> 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><b>Safety Management Functions, Responsibilities, and Authorities Manual.</b> 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><b>Contractor System Engineers.</b> 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><b>Special Tritium Compounds.</b> 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><b>Objective 1-A:</b></p>	<p><b><u>Improvement and Integration of Health and Safety Directives.</u></b> 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 style="text-align: center;"><b>FY 2002 Performance Goals</b></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"> <li>• Effective conduct of hazardous facility, site and complex-wide projects and programs, including roles, responsibilities, competencies, mechanisms, and training,</li> <li>• Safety and hazard analyses,</li> <li>• Quality Assurance, including Software Quality Assurance.</li> </ul> <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**

<p><b>Objective 1–A:</b></p>	<p><b><u>Improvement and Integration of Health and Safety Directives.</u></b> 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 style="text-align: center;"><b>FY 2003 Performance Goals</b></p>	
<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

<p><b>Objective 1-B:</b></p>	<p><b>Technical Competence.</b> 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>
<p style="text-align: center;"><b>Examples of FY 1999 Accomplishments</b></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. 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><b>Objective 1–B:</b></p>	<p><b>Technical Competence.</b> 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>
<p><b>Examples of FY 2000 Accomplishments</b></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>, 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

<p><b>Objective 1-B:</b></p>	<p><b>Technical Competence.</b> 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>
<p style="text-align: center;"><b>Examples of FY 2001 Accomplishments</b></p>	
<p><b>Safety Management Personnel.</b> 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><b>Federal Technical Capability Program.</b> 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><b>Project Management/Engineering.</b> 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><b>System Engineers.</b> 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><b>Nuclear Criticality Safety Program.</b> 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><b>Critical Safety Engineer Qualifications.</b> 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

<p><b>Objective 1-B:</b></p>	<p><b>Technical Competence.</b> 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>
<p><b>FY 2002 Performance Goals</b></p>	
<p>The Board and staff will conduct at least five assessments from among the following types:</p> <ul style="list-style-type: none"> <li>• 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>.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> </ul> <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**

<p><b>Objective 1-B:</b></p>	<p><b>Technical Competence.</b> 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>
<p><b>FY 2003 Performance Goals</b></p>	
<p>The Board and staff will conduct at least four assessments from among the following types:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> </ul> <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

<p><b>Objective 1-C:</b></p>	<p><b>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</b> The Board and its staff will verify the effective and expeditious development and implementation of DOE's Integrated Safety Management (ISM) program.</p>
<p><b>Examples of FY 1999 Accomplishments</b></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

<p><b>Objective 1-C:</b></p>	<p><b><u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u></b> The Board and its staff will verify the effective and expeditious development and implementation of DOE's Integrated Safety Management (ISM) program..</p>
<p><b>Examples of FY 2000 Accomplishments</b></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 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><b><u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u></b> The Board and its staff will verify the effective development and implementation of DOE's Integrated Safety Management (ISM) program.</p>
<b>Examples of FY 2001 Accomplishments</b>	
<p><b>Application of Error Analysis to Authorization Basis Documents.</b> 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><b>Quality Assurance.</b> 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><b>Software Quality Assurance.</b> 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><b>Integrated Hazards Analysis Reviews.</b> 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><b>Activity-level Integrated Safety Management.</b> 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><b>Recommendation 2000-2.</b> 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><b>Design of Tritium Extraction Facility.</b> 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><b>Objective 1–C:</b></p>	<p><b><u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u></b> The Board and its staff will verify the effective and expeditious development and implementation of DOE’s Integrated Safety Management (ISM) program.</p>
<p><b>FY 2002 Performance Goals</b></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"> <li>• Design of the Highly Enriched Uranium Storage Facility at the Y-12 National Security Complex.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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).</li> <li>• 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.</li> <li>• Activity-level ISM implementation at sites with performance indicators judged to have higher than expected rates of occurrences related to worker protection.</li> <li>• 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.</li> </ul>	
<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

<p>Objective 1-C:</p>	<p><b><u>Complex-Wide Implementation of Integrated Safety Management in Facility Design, Construction, Operation, and Post-Operation.</u></b> The Board and its staff will verify the effective and expeditious development and implementation of DOE's Integrated Safety Management (ISM) Program.</p>
<p><b>FY 2003 Performance Goals</b></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"> <li>• 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.</li> <li>• Activity-level ISM implementation at sites with performance indicators judged to have higher than expected rates of abnormal occurrences related to worker protection.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> </ul> <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.

<p><b>Objective 2-A:</b></p>	<p><b>Safe Conduct of Stockpile Management.</b> 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><b>Examples of FY 1999 Accomplishments</b></p>	
<p><b>DOE Standard on Hazards Analysis Reports.</b> 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><b>Lightning Protection at Pantex.</b> 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><b>Chemical Safety.</b> 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><b>Safety Controls for Specific Nuclear Explosive Operations.</b> 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><b>Integrated Safety Management at Pantex.</b> 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><b>Enriched Uranium Restart at Y-12.</b> 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

<p><b>Objective 2–A:</b></p>	<p><b>Safe Conduct of Stockpile Management.</b> 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 style="text-align: center;"><b>Examples of FY 2000 Accomplishments</b></p>	
<p><b>Pit Storage and Repackaging.</b> 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><b>Y–12 Plant Safety Basis.</b> 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><b>W62 Disassembly &amp; Inspection Restart.</b> As a result of the Board’s and its staff’s focused involvement in the reauthorization of Disassembly and Inspection (D&amp;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&amp;I restart activities.</p> <p><b>Pantex Fire Protection.</b> 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><b>Canned Subassemblies.</b> 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><b>Objective 2–A:</b></p>	<p><b>Safe Conduct of Stockpile Management.</b> 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><b>Examples of FY 2001 Accomplishments</b></p>	
<p><b>Startup of a new Dismantlement Activity at Y-12.</b> 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><b>Restart of the Reduction Process at Y-12.</b> 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><b>Maintenance at Y-12.</b> 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><b>Material Storage Facilities at Y-12.</b> 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><b>Recommendation 99-1.</b> 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><b>Lightning Protection at Pantex.</b> 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><b>Fire Protection at Pantex.</b> 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><b>Nuclear Explosive Program Activities.</b> 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 21<sup>st</sup> Century (SS-21) W76 Disassembly &amp; 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><b>Objective 2–A:</b></p>	<p><b>Safe Conduct of Stockpile Management.</b> 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><b>FY 2002 Performance Goals</b></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"> <li>• Site-wide and facility-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., safety analysis reports).</li> <li>• Nuclear explosive operations (e.g., fire protection, the Separation Test Facility, and Pantex Bays and Cells).</li> <li>• Start-up of highly enriched uranium processing activities at the Y-12 National Security Complex (e.g., the hydrogen fluorination system and primary extraction).</li> <li>• 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).</li> <li>• Special studies of unique or significant hazards at a DOE weapons facilities (e.g., process technology alternatives).</li> </ul> <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><b>Objective 2–A:</b></p>	<p><b>Safe Conduct of Stockpile Management.</b> 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 align="center"><b>FY 2003 Performance Goals</b></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"> <li>• 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).</li> <li>• Weapon-specific safety analyses and controls identification and implementation for nuclear weapon activities (e.g., the W62 and the W78).</li> <li>• Start-up of highly enriched uranium processing activities at the Y-12 National Security Complex (e.g., secondary extraction).</li> <li>• Nuclear Explosive operations at Pantex (e.g., the W62, special purpose facilities, and on-site transportation).</li> <li>• 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).</li> <li>• Special studies of unique or significant hazards at a DOE weapons facilities (e.g., process technology alternatives).</li> </ul> <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

<p><b>Objective 2-B:</b></p>	<p><b>Safe Conduct of Stockpile Stewardship.</b> 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><b>Examples of FY 1999 Accomplishments</b></p>	
<p><b>B332 Restart.</b> 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><b>Integrated Safety Management at LLNL.</b> 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><b>Y2K.</b> 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><b>Los Alamos National Laboratory Pajarito Laboratory.</b> 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><b>Damaged Nuclear Weapons.</b> 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><b>Objective 2–B:</b></p>	<p><b>Safe Conduct of Stockpile Stewardship.</b> 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 style="text-align: center;"><b>Examples of FY 2000 Accomplishments</b></p>	
<p><b>LLNL Electrical and I&amp;C.</b> 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><b>LANL Authorization Basis (AB) Documents.</b> 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><b>LANL Response to Cerro Grande Fire and Potential for Flooding.</b> 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><b>LLNL Safety Basis Improvement.</b> 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><b>Readiness to Dispose of a Damaged Nuclear Weapon at the Nevada Test Site.</b> 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><b>LANL Classified Experiment.</b> 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

<p><b>Objective 2-B:</b></p>	<p><b>Safe Conduct of Stockpile Stewardship.</b> 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><b>Examples of FY 2001 Accomplishments</b></p>	
<p><b>LANL Classified Experiment.</b> 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><b>Lightning Detection and Warning at LANL.</b> 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><b>Readiness to Dispose of a Damaged Nuclear Weapon at NTS.</b> 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><b>Safety Management at NTS.</b> 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><b>Design and Construction at LANL.</b> 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><b>LANL Special Recovery Line.</b> 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><b>Fire Protection at LLNL.</b> 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><b>Objective 2-B:</b></p>	<p><b>Safe Conduct of Stockpile Stewardship.</b> 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><b>FY 2002 Performance Goals</b></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"> <li>• The safety basis analysis for defense nuclear activities or facilities; e.g., the Weapons Engineering Tritium Facility and the Plutonium Facility at LANL.</li> <li>• Work-planning process (i.e., activity-specific hazard analysis, controls identification, and implementation of safety controls).</li> <li>• DOE/contractor operational readiness reviews or other readiness determinations.</li> <li>• Preparation to dispose of damaged nuclear weapons and improvised devices at NTS.</li> <li>• 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.</li> <li>• Aging-related changes in nuclear weapons components for weapon systems in the enduring stockpile.</li> <li>• Safety controls selected for hazardous weapons complex activities.</li> <li>• Cross-cutting functional areas at LANL, LLNL, NTS, and SNL.</li> </ul> <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**

<p><b>Objective 2–B:</b></p>	<p><u><b>Safe Conduct of Stockpile Stewardship.</b></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><b>FY 2003 Performance Goals</b></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"> <li>• 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).</li> <li>• Work-planning process e.g., activity-specific hazard analysis, controls identification, and implementation of safety controls.</li> <li>• Plutonium pit manufacturing and certification at LANL.</li> <li>• Preparations to dispose of damaged nuclear weapons or improvised nuclear devices at NTS.</li> <li>• DOE/contractor operational readiness reviews or other readiness determinations.</li> <li>• 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.</li> <li>• Aging-related changes in nuclear weapons components for weapon systems in the enduring stockpile.</li> <li>• Safety controls selected for hazardous weapons complex activities.</li> <li>• Cross-cutting functional areas at LANL, LLNL, NTS, and SNL.</li> </ul> <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>	

**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><b>Objective 3-A:</b></p>	<p><b>Material Stabilization.</b> 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><b>Examples of FY 1999 Accomplishments</b></p>	
<p><b>Improved Remediation Schedules for Legacy Materials:</b> 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><b>Operational Problems at Savannah River Site:</b> 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><b>Completion of Recommendation 94-3 at Rocky Flats:</b> 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><b>Characterization and Safety of Hanford High-Level Waste Tanks:</b> 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><b>Examples of FY 2000 Accomplishments</b></p>	
<p><b>Improved Remediation Schedules for Legacy Materials:</b> 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><b>Standards for Safe Storage of Fissile Materials:</b> 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><b>Engineered Safety Controls:</b> 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><b>Implementation of Radioactive Waste Management Order:</b> 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><b>Safe Storage of High-Level Waste:</b> 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

<p><b>Objective 3-A:</b></p>	<p><b>Material Stabilization.</b> 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><b>Examples of FY 2001 Accomplishments</b></p>	
<p><b>High-Level Waste Management at the Savannah River Site.</b> 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><b>High-Level Waste Tank Integrity.</b> 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><b>Stabilization and Storage of Legacy Materials.</b> 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><b>Plutonium Stabilization and Packaging.</b> 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><b>Uranium-233 Stabilization.</b> 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><b>Hanford Spent Nuclear Fuel Project.</b> 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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<b>FY 2002 Performance Goals</b>	
<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"> <li>• Stabilization and packaging of plutonium metal and oxide at Hanford and LANL (Recommendation 94-1/2000-1).</li> <li>• Design of facilities for stabilization, packaging, and storage of plutonium metal and oxide at Savannah River (Recommendation 94-1/2000-1).</li> <li>• Stabilization and disposal of plutonium-bearing solutions and residues at Savannah River, Hanford, and LANL (Recommendation 94-1/2000-1).</li> <li>• Preparations for pretreatment and disposition of americium/curium solutions at Savannah River (Recommendation 94-1/2000-1).</li> <li>• 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.</li> <li>• Stabilization and disposition of highly-enriched uranium solutions at Savannah River (Recommendation 94-1/2000-1).</li> <li>• 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).</li> <li>• Design of facilities for treatment of high-level waste, and testing and operation of high-level waste retrieval and transfer systems at Hanford.</li> <li>• Design and construction of the Melton Valley transuranic/alpha waste treatment facility at Oak Ridge.</li> <li>• 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.</li> <li>• 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).</li> <li>• Complex-wide legacy nuclear material issues, including evaluation of materials not addressed by Recommendations 94-1 and 2000-1 and utilization of stabilization capabilities.</li> </ul>	

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<p><b>FY 2003 Performance Goals</b></p>	
<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 (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"> <li>• Stabilization, packaging, and storage of plutonium metal and oxide at Hanford and LANL (Recommendation 94-1/2000-1).</li> <li>• Design of facilities for stabilization and packaging of plutonium metal and oxide at Savannah River (Recommendation 94-1/2000-1).</li> <li>• Stabilization and disposal of plutonium-bearing solutions and residues at Savannah River and LANL (Recommendation 94-1/2000-1).</li> <li>• Preparations for neptunium solutions stabilization at Savannah River (Recommendation 94-1/2000-1).</li> <li>• Preparations for pretreatment and disposition of americium/curium solutions at Savannah River (Recommendation 94-1/2000-1).</li> <li>• Characterization, stabilization, and packaging of uranium-233 (U-233) materials at Oak Ridge (Recommendation 97-1), as well as planning and preparations for processing of U-233 for potential medical applications.</li> <li>• Stabilization and disposition of highly-enriched uranium solutions at Savannah River (Recommendation 94-1/2000-1).</li> <li>• Design of the treatment facility for high-level waste liquids and salts at the Savannah River Site (Recommendation 96-1), including pilot plant operations, and system improvements to ensure safe management of the Savannah River Site high-level waste in the interim (Recommendation 2001-1).</li> <li>• Design of facilities for treatment of high-level waste, and testing and operation of high-level waste retrieval and transfer systems at Hanford.</li> <li>• Start-up of the Melton Valley transuranic/alpha waste treatment facility at ORNL.</li> <li>• Safety of spent nuclear fuel and sludge transfer and storage/stabilization operations at Hanford (Recommendation 94-1/2000-1).</li> <li>• Safety of full throughput contact-handled and remote-handled transuranic waste operations at WIPP.</li> <li>• Complex-wide legacy nuclear material issues, including evaluation of materials not addressed by Recommendations 94-1 and 2000-1 and utilization of stabilization capabilities.</li> </ul>	

**GOAL 3 — Safe Disposition of Hazardous Remnants of Weapons Production**

<p><b>Objective 3-B:</b></p>	<p><b>Facility Decommissioning.</b> 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><b>Examples of FY 1999 Accomplishments</b></p>	
<p><b>Upgraded Safety Controls for Decommissioning at Rocky Flats.</b> 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><b>Activity Level ISM of Hanford Decommissioning Work.</b> 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><b>Radiation Protection Measures for Metal Tritides during Decommissioning.</b> 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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<p style="text-align: center;"><b>Examples of FY 2000 Accomplishments</b></p>	
<p><b>Efforts to Improve Decommissioning Work at the Hanford 233-S Facility.</b> 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><b>Upgraded Work Controls for Decommissioning at Rocky Flats.</b> 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><b>Upgraded Safety Controls for Decommissioning Work at Rocky Flats.</b> 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><b>New and Revised Procedures for Decommissioning Work at the Miamisburg Environmental Management Project.</b> 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

<b>Objective 3-B:</b>	<b>Facility Decommissioning.</b> 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.
<b>Examples of FY 2001 Accomplishments</b>	
<p><b>Building 9206 at Oak Ridge.</b> 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><b>Decommissioning Activity at Miamisburg Environmental Management Project.</b> 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><b>Hanford Site Deactivation Activities.</b> 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><b>Rocky Flats Environmental Technology Site.</b> 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>	

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<p><b>FY 2002 Performance Goals</b></p>	
<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"> <li>• Building 371, 707, 771, or 776/777 at Rocky Flats.</li> <li>• Building 9206 at Y-12 National Security Complex.</li> <li>• Excess facility structural issues at Hanford and Savannah River.</li> <li>• Decommissioning at Los Alamos National Laboratory</li> <li>• CPP-603 spent fuel basin at INEEL.</li> </ul>	

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<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"> <li>• Plutonium Finishing Plant deactivation planning at Hanford.</li> <li>• Building 371, 707, or 776/777 at Rocky Flats.</li> <li>• Decommissioning activities at Mound and Fernald Environmental Management Projects.</li> <li>• Building 9206 at Y-12 National Security Complex.</li> <li>• Promulgation of lessons-learned and decommissioning techniques from sites where significant decommissioning activities have been accomplished.</li> </ul>	

