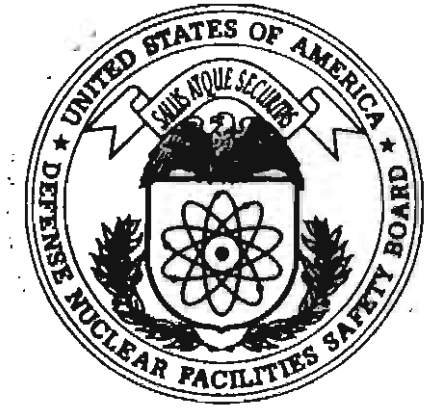
FIFTH ANNUAL REPORT

TO CONGRESS

DEFENSE NUCLEAR FACILITIES SAFETY BOARD



FEBRUARY 1995

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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To the Congress of the United States:

The Defense Nuclear Facilities Safety Board is pleased to submit to the Congress its fifth annual report for calendar year 1994. An independent executive branch establishment, the Board provides advice and recommendations to the President and the Secretary of Energy regarding public health and safety issues at Department of Energy (DOE) defense nuclear facilities. The Board also reviews and evaluates the content and implementation of health and safety standards, as well as other requirements, relating to the design, construction, operation, and decommissioning of DOE defense nuclear facilities.

As required by statute, the Board's report summarizes activities during calendar year 1994, assesses improvements in the safety of DOE defense nuclear facilities, and identifies remaining safety problems.

Congress directed the Board to include in its fifth annual report "an assessment of the degree to which the overall administration of the Board's activities are believed to meet the objectives of Congress in establishing the Board" and the Board's "recommendations for continuation, termination, or modification of the Board's functions and programs . . . ." This report contains the required assessment and recommendations.

Respectfully submitted,

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Chairman

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Vice-Chairman

John W. Crawford, Jr.
Member

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Member

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Frontispiece

This report has been prepared in two parts. Part 1 covers Board activities related to health and safety during 1994. Part 2 is a summary and evaluation of the major activities of the Board over the past five years. This evaluation is in response to a special reporting requirement set forth in the Board's enabling legislation. The detailed portion of this 5th Year Report is preceded by an Executive Summary.

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PART 1

REPORT TO CONGRESS ON BOARD ACTIVITIES RELATED TO HEALTH AND SAFETY DURING 1994

I. PROGRESS ENSURING SAFETY AT DEFENSE NUCLEAR FACILITIES

A. INTRODUCTION

For nearly half a century, the Department of Energy (DOE) and its predecessor agencies operated the nation's defense nuclear weapons complex without independent external oversight. In the late 1980's, it became increasingly clear to members of Congress that significant public health and safety issues had accumulated at many of the aging facilities in the weapons complex. As an outgrowth of these concerns, Congress created the Defense Nuclear Facilities Safety Board (Board) in 1988 as an independent oversight organization within the Executive Branch charged with providing advice and recommendations to the Secretary of Energy "to ensure adequate protection of public health and safety" at DOE's defense nuclear facilities. By the Fall of 1989, the initial five members of the Board had been appointed by the President and confirmed by the Senate and staff recruitment efforts were underway.

Broadly, the Board is responsible for independent oversight of all activities impacting nuclear safety within DOE's nuclear weapons complex, which in the past served to design, manufacture, test, and maintain nuclear weapons. The complex is now engaged in cleanup (principally from radioactive contamination), disassembly of nuclear weapons as the nation's stockpile of weapons is reduced in size, and maintenance of the smaller stockpile. There is increased activity in preparing to store fissionable material from disassembled nuclear weapons, and material that still remains in the production pipeline, through which flow has been halted.

The Board reviews and analyzes facility and system design, operations, practices and events, and makes recommendations to the Secretary of Energy that the Board believes are necessary to ensure adequate protection of public health and safety. The Secretary may accept in whole or in part or disapprove the recommendations. The Board must consider the technical and economic feasibility of implementing the recommended measures, and the Secretary must report to the President and Congress if implementation of a recommendation is impracticable because of budgetary considerations. If the Board determines that an imminent or severe threat to public health or safety exists, the Board is required to transmit its recommendations to the President, as well as to the Secretaries of Energy and Defense.

The Board's enabling statute, 42 U.S.C. § 2286 et seq., requires the Board to review and evaluate the content and implementation of health and safety standards, including DOE's Orders, rules, and other safety requirements, relating to the design, construction, operation, and decommissioning of DOE's defense nuclear facilities. The Board must then recommend to the Secretary of Energy any specific measures, such as changes in the content and implementation of those standards, that the Board believes should be adopted to ensure that the public health and safety are adequately protected.

The Board also is required to review the design of new defense nuclear facilities before construction begins, as well as modifications to older facilities, and to recommend changes necessary to protect health and safety. Review and advisory responsibilities of the Board continue throughout the full life cycle of facilities, including shutdown and decommissioning phases.

The Board may conduct investigations, issue subpoenas, hold public hearings, gather information, conduct studies, establish reporting requirements for DOE, and take other actions in furtherance of its review of health and safety issues at defense nuclear facilities. These ancillary functions of the Board relate to the accomplishment of the Board's primary function, which is to assist DOE in identifying and correcting health and safety problems at defense nuclear facilities. The Department of Energy and its contractors at defense nuclear facilities are required to cooperate fully with the Board.

The Board is required by statute to report to Congress each year concerning its oversight activities, its recommendations to the Secretary of Energy, and improvements in safety achieved at defense nuclear facilities as a result of its activities. The Board's Annual Report for activities during 1994 is presented in Part 1, including new recommendations issued during the past year and progress made by DOE in implementing the Board's recommendations from previous years. Part 2 covers the special issues required by the enabling statute to be addressed in its Fifth Annual Report, including an assessment of how well the Board has met Congressional objectives during its first five years of operation.

B. SUMMARY OF 1994 TECHNICAL ACTIVITIES

During 1994, the Board continued to respond to changes in the mission of DOE's defense nuclear facilities, placing emphasis on the disassembly of nuclear weapons and the safe disposition of surplus nuclear components and materials, and the facilities, personnel, and infrastructure necessary to do these things. The problem of managing surplus materials and the associated wastes that have accumulated from past weapons production is becoming more acute with the passage of time. Recent incidents involving bulging waste storage containers, ruptured drums and contamination of workers and facilities are likely precursors of potentially more serious situations. The large volumes of highly radioactive material left in process lines, tanks, vaults, drums, and storage basins when production facilities were shut down constitute a serious hazard.

The Board identified several areas where the potential for major safety issues exists and near-term corrective action is needed.

- Detailed complex-wide reviews and subsequent analyses revealed significant near-term safety risks in the storage of residual plutonium and spent fuel.

- An in-depth review of low-level waste storage revealed major deficiencies at a number of DOE defense nuclear sites. These included a lack of compliance with DOE standards, practices not comparable to commercial practices, a lack of performance assessments, and no requirement to evaluate sites containing waste disposed of prior to 1988.

- Seismic-structural evaluations by the Board and its outside experts have shown the need for examination of the adequacy of DOE's defense nuclear facilities selected for long-term missions, e.g., Rocky Flats Building 371 which is to be used for storage of a large amount of plutonium.

- Observation that personnel at the Oak Ridge Y-12 Plant had failed to follow procedures, established to prevent criticality incidents, led to the discovery of many violations of safety procedures and overall poor conduct of operations. The Board also informed DOE of inadequacies in design basis information involving safety systems, in configuration management, and in flow-through of technical requirements to operational procedures at the Pantex Plant and at Los Alamos National Laboratory (LANL). In all three cases, operations were suspended pending correction of the problems.

- The Board has continued to press for the implementation of adequate safety standards and has determined that implementation may be impaired by delays and uncertainties in DOE's rulemaking process.

The Board issued five sets of recommendations during 1994, totaling 43 sub-recommendations. In Recommendation 94-1, the Board addressed the need to expedite the stabilization and proper storage of thousands of kilograms of unstable solid plutonium residues, corroding spent fuel and highly radioactive liquids at several sites. The Board recommended that DOE establish a program to stabilize the hazardous solids and liquids within a three-year period and expedite efforts to remove and properly store degrading spent fuel. As an indication of public concern over this issue, the Board responded to requests for more than 500 copies of a Board technical report, "Plutonium Storage Safety at Major Department of Energy Facilities," released April 14, 1994, which describes the nature and status of many of these materials and discusses standards for stabilizing and storing plutonium materials. Extensive reviews and continued pressure by the Board contributed directly to DOE's decision to develop a comprehensive and accelerated plan for the removal and long-term storage of spent nuclear fuel stored in the K Reactor Basins near the Columbia River.

A Board survey of low-level waste facilities throughout the DOE defense complex has shown that DOE's practices do not meet current standards required of commercial entities and that no integrated, systematic plan for evaluating and improving these facilities is being implemented. The lack of an adequate plan to proceed affects directly

the likelihood of safe and effective decommissioning and decontamination throughout the complex. Therefore, the Board issued Recommendation 94-2, urging DOE to: complete a comprehensive, complex-wide review of the low-level waste issue; take immediate steps to complete performance assessments; and develop an action plan wherever non-compliance with DOE's dose criteria is found.

A number of seismic-structural reviews throughout the complex have led to questions as to public health and safety at facilities which may be subjected to severe external forces from earthquakes, extreme winds, and floods. In particular, an assessment and assurance of adequate protection of public health and safety are needed for Building 371 at Rocky Flats, which is planned for the long-term storage of large quantities of plutonium. Recommendation 94-3 requires that a systems engineering methodology be used to formulate an integrated program plan that would address the civil-structural-seismic safety issues and evaluations related to the planned use of Building 371. This is required to be able to specify safety upgrades and improvements to Building 371 consistent with its mission.

In September 1994, during routine site reviews, several violations of nuclear criticality safety limits in storage vaults were observed at the Oak Ridge Y-12 Plant. Additional reviews and self-assessments by the DOE and contractor personnel resulted in a finding of major deficiencies in conduct of operations and a curtailment of Y-12 activities. The apparent breakdown of administrative controls, along with observation of other conduct of operations problems, were key factors leading the Board to issue Recommendation 94-4. The Board asked that DOE determine any immediate actions necessary to resolve nuclear criticality safety deficiencies at the Y-12 Plant. The Board also asked that DOE fully evaluate compliance with Operational Safety Requirements (OSRs) and Criticality Safety Approvals (CSAs), determine root causes of identified violations, review the nuclear criticality safety program, and establish actions to resolve the nuclear criticality deficiencies at Y-12. The Board also urged DOE to compare the level of conduct of operations at Y-12 to the level expected by DOE in implementing the Board's Recommendation 92-5 (conduct of operations).

Throughout site visits in 1994, the Board saw evidence of a slowdown in order compliance, e.g., implementation of the Radiation Control Manual. In addition, several memoranda issued by DOE managers have indicated a tendency to accept delays in compliance with safety related orders pending issuance of rules or plans to implement rules already issued, despite earlier high-level assurances that such relaxation would not be permitted. Given this situation, the Board issued Recommendation 94-5 requiring the DOE to take strong actions to ensure there is no relaxation of commitments made to achieve compliance with existing requirements in safety orders while proposed rules are being developed.

The Board also recommended that DOE ensure that compliance with the minimal (baseline) set of safety requirements contained in Rules is not construed as full compliance with all necessary safety requirements and does not displace effort to develop and implement through Requirements Identification Documents (RIDs) the best nuclear safety requirements and practices embodied in rules, orders, standards, and other safety directives.

In addition, the Board asked DOE to clearly establish line, oversight, and legal responsibilities for review and approval of contractual provisions specifying environment, health and safety requirements for DOE's contractors at defense nuclear facilities. Doing so would help to ensure that the requirements-based safety management program established by the Department will be uniformly developed and consistently imposed across the complex.

II. MAJOR TECHNICAL ACTIVITIES OF THE BOARD DURING 1994

A. HEALTH AND SAFETY MANAGEMENT OF DEFENSE NUCLEAR FACILITIES

A significant result of the last major reorganization of the Department of Energy in 1993 was that the roles and responsibilities of the offices involved in nuclear safety were not clearly delineated. In May 1994, the Board imposed a reporting requirement on DOE (pursuant to 42 U.S.C. 2286b(d)) requiring the Department to provide a "brief summary description of the basic safety management system that DOE currently has in place for satisfying its responsibilities under the Atomic Energy Act 'to protect or to minimize danger to life and property.' " The Board requested DOE to describe how safety is considered throughout the life cycle of defense nuclear facilities, including the major stages of design, construction, operation, and decommissioning. DOE was also requested to clearly define the nuclear safety responsibilities of the various line and internal oversight organizational elements.

In its October 1994 response, DOE described the objectives, tasks, and safety considerations for each phase of the system life cycle, as well as the general transition, interface, and information flow requirements among the phases. The response provides a systems-oriented framework for DOE to examine its safety management program critically. Additionally, the Department revised its Manual of Functions, Assignments and Responsibilities. The Board views these steps as positive measures toward strengthening the Department's safety management program, and is now assessing the effectiveness with which this manual has been implemented by headquarters and field organizations.

In response to budgetary restrictions, the Secretary announced a plan in December 1994 to review the structure of the Department. This effort, to be performed by both DOE employees and independent experts, should afford a valuable opportunity to address systematically the subject of health and safety responsibilities of individuals and organizations within the Department. Because of the clear opportunity for the Department to improve its health and safety management, the Board intends to monitor this effort during 1995.

B. SAFETY ASPECTS OF THE ASSEMBLY, DISASSEMBLY, AND TESTING OF NUCLEAR WEAPONS

DOE is responsible for maintenance and support of the active nuclear weapons stockpile, retaining the capability to resume nuclear testing (in accordance with Presidential direction), dismantlement of nuclear weapons, and associated research and development. The nature of DOE's weapons mission in these areas has changed from its former thrust toward design, production and testing to an emphasis on dismantlement, stockpile maintenance, decommissioning, and safe storage. DOE has defined its

adjustments to these changes in two program initiatives: (1) Stockpile Management, which deals with the retention of capability to maintain the systems in the U.S. nuclear weapons stockpile; and (2) Stockpile Stewardship, which deals with retention and development of the technological tools necessary to maintain confidence in the safety, reliability, and performance of U.S. nuclear weapons and their associated components. The thrust of these initiatives is to move toward a smaller, but fully capable nuclear weapons complex.

DOE's efforts to adapt the nuclear weapons complex to reflect changes in the U.S. national security posture have resulted in new areas needing safety attention. The Board has taken action on four fronts to help ensure that such changes do not degrade nuclear safety. These four areas of primary focus in 1994 were: (1) the adequacy of technical staffing, (2) the evaluation of facility and process readiness, (3) the conduct of ongoing operations, and (4) ensuring that the safety of operations is standards-based.

Adequacy of Technical Staffing: The Board continues to note the close relationship between the recruitment, training, and retention of well-qualified personnel and nuclear safety. This issue is an especially crucial one in a "downsizing" environment. The continued need for technically competent personnel in the weapons complex was addressed by the Board in its 1993 Recommendation 93-6; Recommendation 93-3 addressed this issue DOE-wide.

The Board issued Recommendation 93-6 to highlight the need to retain access to and capture the unique knowledge of individuals who have been engaged for many years in assembly, disassembly, and testing of nuclear weapons, so as to avoid future safety problems. The Board noted that many individuals are being lost from the defense nuclear system, due to retirement incentives, layoffs, and other downsizing activities, and that these individuals possess information that is not presently documented. Retention of this information is essential if DOE is to maintain the capability to safely manage and maintain the weapons stockpile, and conduct dismantlement activities.

The Secretary accepted Recommendation 93-6 in February 1994, stating that the Department shared the Board's concern about ensuring capability to conduct nuclear weapons testing operations and dismantle nuclear weapons safely. In May 1994, the Secretary notified the Board that 45 additional days were needed to develop an integrated and effective approach. In its response to the Secretary, the Board stressed that some aspects of the recommendation have a high degree of urgency, emphasizing that impending early retirement of weapons experts in DOE and the National Laboratories would exacerbate an already inadequate staffing situation. The Board noted that technical competence in DOE's defense activities was already below a level necessary for continued safety, and urged an aggressive approach to supplement the Defense Programs organization with additional, technically competent personnel.

In July 1994, the Department submitted an Implementation Plan generally acceptable to the Board. A specific element of the plan committed to an immediate review of staffing of specific organizational elements of DOE's weapons complex and the need for additional, technically qualified personnel. Unfortunately, the initial efforts to assess staffing were unsatisfactory. In September 1994, the Board wrote to the Department, stating that the initial report did *"not address either of the explicit requirements of the commitment (i.e., the status of current staffing and recommendations for additional staff)."* However, discussions between the Board and the Secretary led to a commitment by DOE in late 1994 to: (1) allow the Headquarters staff to be supplemented immediately with ten additional personnel for nuclear safety-related activities; (2) conduct a comprehensive technical staffing review to identify where technical resources were lacking; and (3) determine how to focus additional resources.

In general, DOE's progress on meeting the commitments in its implementation plan for Recommendation 93-6 has been limited, due in part to the staffing inadequacies highlighted by the Board. In its September letter, the Board informed DOE of a number of deficiencies. As a result of the Board's letter, DOE assigned senior DOE managers to better coordinate implementation of Recommendation 93-6. Their efforts did result in some additional progress, but at year-end, implementation of Recommendation 93-6 was still substantially behind schedule.

The potential safety impact of a delay in meeting the objectives of Recommendation 93-6 is significant.

During 1994, the Board also made inquiries as to the availability of technically qualified former military personnel to perform duties within the weapons complex. This topic was the subject of a meeting between members of the Board and the Deputy Secretary of Defense in July 1994. At that meeting, the members also specifically addressed the importance of assigning a senior military officer to the position of DOE Deputy Assistant Secretary for Military Applications and Stockpile Support (DASMASS) for a period longer than the customary two-year tour. That officer should be a technically competent manager with a background in nuclear weapons and/or nuclear facilities. They also addressed the need for the Department of Defense to continue its attention to the selection of highly qualified individuals of sufficient stature and commitment to critical positions as an essential element in ensuring the continuing safety of the defense nuclear complex.

Evaluation of facility and process readiness: The readiness of facilities in the weapons complex to operate safely was a topic of significant Board attention throughout 1994. Particular emphasis was placed on conduct of appropriate readiness reviews. For specific weapon assembly and disassembly operations, the Nuclear Explosive Safety Study (NESS) along with the Qualification Evaluation (QE) processes are utilized to independently assess readiness.

In December 1993, the Board called for an independent review of the NESS process. Subsequently, a review of the NESS process was conducted by an independent team composed of nuclear safety professionals from the Department of Defense and the DOE National Weapon Laboratories. Completion of this review in May 1994 led to the development of a NESS Corrective Action Plan, which addressed program deficiencies, a number of which were taken care of by DOE immediately by issuing interim guidance instructions. The remaining corrective actions are being integrated with the implementation of an earlier Recommendation 93-1[1], and are scheduled for completion by June 1995.

Throughout 1994, the Board exercised oversight of the majority of NESSs performed by DOE for operations at the Pantex Plant and at the Nevada Test Site. Oversight reviews were focused on the adequacy of interim guidance issued by DOE, and on field compliance with the guidance and with the requirements of DOE Order 5610.11 (which addresses nuclear explosive safety).

Guidance for readiness reviews of weapons operations was developed by DOE in response to Recommendation 92-6. The guidance calls for a Qualification Evaluation (QE) to be performed after certification of readiness by contractor and DOE line management. The QE, performed by a team of National Weapon Laboratory personnel, assesses the adequacy and correctness of the procedures for weapon assembly or disassembly, and verifies that safety considerations have been addressed. The Board provided DOE with suggested improvements to DOE's guidance paper, and at year-end, DOE was in the process of responding to the Board's comments.

The Board observed and reviewed implementation of the QE process at the Pantex Plant. On-going efforts to implement the process resulted in the identification of improvements required by both the DOE Amarillo Area Office and the DOE Albuquerque Operations Office. The lessons learned from reviews performed in 1994 are to be used by DOE to upgrade future QEs.

Recommendation 93-6 called for maintaining safety-related nuclear testing expertise to ensure that if testing is required in the future, it can be resumed safely. In support of this effort, and in response to Recommendation 92-6, DOE developed a Test Readiness Assessment (TRA) program. DOE uses full-scale exercises as a primary means to achieve test readiness. The Board provided several observations on the conduct of testing exercises where the intent of Recommendation 93-6 was not being met, and DOE committed to strengthen the exercise program in the areas identified by the Board.

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[1] Recommendation 93-1 addressed the need for consistency between safety standards applied to facilities involved with design, production, or testing of nuclear explosives and those applied to other DOE nuclear facilities.

Conduct of Ongoing Operations: Detailed review of the ongoing operations at facilities in the weapons complex received high priority in 1994. These reviews included, for example, standards-based evaluations of: conduct of operations, radiological controls, operational safety, maintenance of safety-related systems, and quality assurance. One such review performed at the Y-12 Plant in Oak Ridge disclosed systemic problems with criticality safety and conduct of operations; these were addressed by the Board in Recommendation 94-4. These problems are discussed in detail in Section I.E.1. At the Pantex Plant, the Board continued to monitor DOE's progress in implementing a satisfactory level of conduct of operations, pursuant to its corrective action plan issued in response to the Board's November 1993 reporting requirement.

Standards-based Operations: During 1994, DOE completed its analysis of the differences between the safety requirements applicable to nuclear explosives facilities and those which are applicable to other defense nuclear facilities, as called for in the Department's Implementation Plan for Recommendation 93-1. This analysis, coupled with the analysis called for in a December 1993 Board letter regarding the Nuclear Explosive Safety Study (NESS), led DOE to conclude that the guidance and requirements contained in its 5610 series of orders (on Nuclear Explosive Safety) needed improvement.

The Department developed a plan to improve the requirements applicable to nuclear explosive facilities, which were set forth in orders and the NESS program. DOE also committed to developing an action plan for upgrading and expediting order compliance self-assessments at facilities that assemble, disassemble and test nuclear weapons.

Progress in achieving these improvements in order compliance self-assessment has been inconsistent, with some facilities showing substantial improvements (e.g., Los Alamos National Laboratory) and others lagging behind (e.g., Lawrence Livermore National Laboratory and the Nevada Test Site). On the other hand, the Board was encouraged by DOE's commitment to extend the applicability of selected safety orders and to enhance the set of DOE standards.

C. SAFELY MANAGING SURPLUS NUCLEAR MATERIALS AND WASTES

1. Safe Disposition of Surplus Nuclear Materials

Recommendation 94-1, issued in May 1994, called for an accelerated schedule for stabilizing and repackaging unstable special nuclear materials and spent fuel. DOE's Plutonium Vulnerability Study, a detailed and wide-ranging evaluation of the safety of plutonium stored in DOE facilities, reached conclusions similar to those reached by the Board. However, the Board has concluded that the risks posed by those materials are more serious than appears to be recognized by DOE, and that DOE's schedules for

stabilizing and repackaging need to be accelerated in the interests of worker and public safety. Recommendation 94-1 specifically called on DOE to:

- bring stored plutonium metal and oxide at all sites into conformance with the DOE plutonium storage standard within approximately eight years;
- process the plutonium and trans-plutonium solutions in the Savannah River Site's F-Canyon within 2-3 years into forms safer for interim storage;
- repackage plutonium metal in contact with plastic at all sites within 2-3 years;
- process possibly unstable plutonium residues at Rocky Flats within 2-3 years into forms suitable for interim storage;
- process deteriorating irradiated fuel at the Savannah River Site within 2-3 years into forms suitable for interim storage;
- place deteriorating irradiated fuel from the K-Basins at the Hanford Site in a stable configuration within 2-3 years;
- establish a research program to help choose among candidate processes for conversion to interim forms and longer-term disposition; and
- maintain facilities that may be needed for future handling and treatment of such materials.

The Department's initial Implementation Plan, submitted in December 1994, was not acceptable to the Board. DOE agreed in general terms with the Board's objectives but declined to commit itself to the recommendation's timetable for taking specific actions. Meanwhile, the Board's sense of urgency was reinforced by further developments after the recommendation was issued.

As postulated by the Board, high concentrations of hydrogen gas have been found in the headspace of drums containing plutonium residues at Rocky Flats. Radiography of these drums during 1994 showed that the residues were contained in plastic bottles, rather than in sealed stainless steel cans, as called for by good practice. The Board has concluded that substantially increased action is required to implement Recommendation 94-1.

Recommendation 94-1 recommended that storage of all plutonium metal and oxide conform to the then-draft DOE plutonium storage standard. DOE subsequently issued the standard (in December 1994) requiring that plutonium oxide be thermally stabilized before

packaging for storage, and that containers used to store plutonium metal or oxide be sealed, structurally adequate, corrosion-resistant, and free of organic materials. This will require repackaging thousands of items stored at Rocky Flats, the Los Alamos and Lawrence Livermore National Laboratories, the Hanford Site, and the Savannah River Site.

DOE has identified several sites where it is known or suspected that plutonium metal is in contact with plastic, creating the potential for producing radiolytic hydrogen. These sites include Rocky Flats (approximately 250 items), the Savannah River Site (12 containers), and the Mound Site (number of items not known). Currently, thirteen of the plutonium items that were originally packaged in contact with plastic at Rocky Flats have been repackaged.

DOE has proposed processing the plutonium solutions remaining in F-Canyon systems at the Savannah River Site to metallic form within two years. It is planned that the trans-plutonium solutions will be vitrified in F-Canyon within the next five years, but the Board is concerned that continued storage of this highly radioactive material in a liquid form poses potential risks to the public. The Board is working with DOE to explore alternatives that would lead to this material being stabilized sooner. In addition, DOE is developing plans to stabilize the remaining uranium, neptunium, and plutonium solutions being stored in H-Canyon and F-Canyon. The Board will continue to monitor these plans to ensure that these materials are stabilized safely and in a timely manner.

In January 1995, DOE formally withdrew the Implementation Plan for Recommendation 94-1, in response to the Board's dissatisfaction. A revised Plan is scheduled to be delivered to the Board in February 1995. The Board expects that DOE will make firm commitments for an aggressive schedule to accomplish the stabilization called for in Recommendation 94-1.

2. Accelerated Waste Characterization at the Hanford Site

The Board continues to urge DOE to accelerate the pace of the program for characterizing and processing the contents of high level nuclear waste tanks at the Hanford Site. In its 1990 Recommendation 90-7, the Board stated that the schedule for characterizing tanks containing ferrocyanide compounds needed to be greatly accelerated. Its Recommendation 93-5 expanded upon Recommendation 90-7, stating that DOE should complete all safety-related characterization of high-level waste tanks at the Hanford Site within three years, with the characterization of the high priority tanks being completed in the first two years. Recommendation 93-5 also called for the characterization program to be integrated into the systems engineering program for the Tank Waste Remediation System at the Hanford Site to ensure the data necessary to select treatment and immobilization methods will be available when needed. The Secretary of Energy

accepted these recommendations. The Implementation Plan for Recommendation 93-5 was accepted by the Board in March 1994.

Sampling and analysis of the contents of high-level waste tanks are far behind schedule. The schedule problems involve both the characterization strategy and its subsequent execution. DOE has not been able to develop a technically defensible strategy for efficiently characterizing the high-level waste tanks. Mechanical problems and poor sample recovery have plagued the contractor's core sampling equipment. The contractor is operating to a schedule that will not complete safety-related characterization of watch list tanks until two years after the Implementation Plan commitment, and the remaining tanks one year later than committed. DOE is analyzing the situation to see if the goals of Recommendation 93-5 can be achieved with substantially less sampling and analysis. Thus far, no technically sound plan of action has emerged, and DOE has not convinced the Board that it can meet the goals of Recommendation 93-5.

3. Storage of Spent Nuclear Fuel

During 1994, the Board continued its 1993 activities in review of storage of spent nuclear fuel storage at the Idaho National Engineering Laboratory (INEL), the Savannah River Site, and the Hanford Site.

In the past year, 189 fuel containers were successfully moved from an old, structurally unstable location to a newer and more structurally competent storage basin at the Idaho Chemical Processing Plant. The Board considers these and other actions being taken to manage vulnerabilities at INEL to be a DOE safety improvement.

The K-East Basin at the Hanford Site contains more than a thousand tons of deteriorating, irradiated nuclear fuel. The fuel is substantially corroded and the basin is heavily contaminated. These degraded conditions result in increased waste generation, higher personnel exposure, and greater difficulty in the handling, storage and disposal of the fuel. The K-East Basin has leaked on several occasions, and is likely to leak again. In addition, analysis shows that in a severe seismic event, the basin may not remain intact. Contaminated water released from the basin could migrate to the nearby Columbia River.

As part of its Recommendation 94-1, the Board called for the deteriorating fuel in the Hanford Site's K-East Basin and fuel storage basins at the Savannah River Site to be placed in a stable configuration for interim storage within two to three years. DOE's current planning calls for packaging the K-East Basin fuel and the associated fission product sludge, and removing it from the basin by 1999. Defense-related fuel in the Savannah River Site basins is scheduled for processing by 2004, with the bulk of the most deteriorated fuel being processed by 1997. DOE is currently re-evaluating its commitments under Recommendation 94-1, in an effort to improve these schedules.

4. Low Level Waste Management

In September 1994, as part of its Recommendation 94-2, the Board recommended that DOE complete a complex-wide review of the low-level waste issue, with the objectives of establishing the dimensions of the low-level waste problem and identifying necessary corrective actions to bring operations into compliance with applicable safety standards. In preparation for the substantial increase in low-level waste projected from cleanup programs, the Board recommended that DOE's Implementation Plan include a program for forecasting future burial needs. The Board urged that more immediate steps be taken to complete performance assessments for all active low-level waste burial sites, as required by DOE Order 5820.2A. The Board also recommended that DOE issue instructions to ensure that performance assessments are based on total inventories of low-level waste (past, present, and future) emplaced or planned for a burial site and that performance objectives be achieved for the composite of all low-level waste disposal facilities on the site.

The Secretary of Energy accepted Recommendation 94-2 in October 1994 and committed to undertake a complex-wide baseline assessment of DOE's low-level radioactive waste disposal requirements and practices. The Department also recognized the importance of assessing cumulative impacts to the public health and safety due to total waste inventories and all low-level waste disposal facilities on a site. At year-end, DOE was in the process of developing its Implementation Plan.

D. SAFETY ASPECTS OF CONDUCT OF OPERATIONS

1. Conduct of Operations

DOE's requirements regarding conduct of operations at its facilities are set forth in DOE Safety Order 5480.19, which establishes the expectation that operational formality at defense nuclear facilities be on a par with that used by the commercial nuclear industry. In June 1994, as part of DOE's annual report for Recommendation 92-5, the Department provided a brief description of the operational status and plans for future use of facilities in the defense nuclear complex.

The report did not present significant new initiatives regarding requirements for conduct of operations. Recent reportable occurrences and observations made during site visits by the Board's staff members, and DOE's August 1994 report of its review of conduct of operations, indicate slow and uneven progress in implementing Departmental requirements. The status of implementation of DOE 5480.19 as stated in the June 1994 report, is too optimistic since significant deficiencies exist in the implementation of this order throughout the complex, more than four years after its issuance.

An example of deficient conduct of operations practices is provided by recent observations at the Y-12 Plant in Oak Ridge. Although DOE and the operating contractor at the Y-12 Plant at the Oak Ridge Site have made some improvements in conduct of operations over the past two years, several violations of Operational Safety Requirements (OSRs) and Compliance Schedule Agreements (CSAs) during 1994 indicated an unsatisfactory level of conduct of operations.

In September 1994, during a routine site review, members of the Board's staff observed several violations of nuclear criticality safety limits in Y-12 storage vaults and brought these violations to the attention of contractor management and the DOE Facility Representative. Neither the DOE nor contractor personnel present took the actions required by the applicable criticality safety procedure. Proper actions were taken only after members of the Board's staff notified the DOE Y-12 Site Office Manager. As a result of these violations, contractor management curtailed Y-12 activities and began a comprehensive site-wide review of compliance with all CSAs. That review identified more than 1300 CSA noncompliances. Contractor management subsequently shut down all operations at Y-12 pending correction.

This apparent breakdown of administrative controls and other conduct of operations problems at Y-12 were key factors leading the Board to issue Recommendation 94-4,[2] calling for DOE to fully evaluate compliance with OSRs and CSAs, determine root causes of identified violations, review the nuclear criticality safety program, and establish actions to resolve the nuclear criticality deficiencies at Y-12. The Board also urged DOE to compare the level of conduct of operations at Y-12 to the level expected by DOE in implementing the Board's Recommendation 92-5.

DOE accepted Recommendation 94-4 in mid-November, and is developing an implementation plan in parallel with improving criticality safety, conduct of operations, and other administrative safety programs before resuming Y-12 operations. During 1995, the Board intends to monitor DOE's efforts to resume operations at Y-12.

On the other hand, some notable examples exist where the right mix of management attention, resources, and staffing expertise has been brought together to implement an effective conduct of operations program. Examples include the startup of the Replacement Tritium Facility and the restart of F-Canyon, both at the Savannah River Site; and the restart of Building 559 at Rocky Flats. At these facilities, line managers were personally committed to the program and involved in finding and correcting problems, and communicated their strong support and expectations to subordinates. Sufficient numbers of experienced operations personnel were assigned to the facilities, and

[2] See Appendix A.

DOE field organizations were staffed with knowledgeable managers and facility representatives who were committed to enforcing the correct standards.

2. Readiness of Facilities to Operate

In response to Recommendation 92-6, DOE issued a new order, DOE Order 5480.31, in September 1993, establishing requirements for starting or resuming operations and the readiness review process. An associated standard, DOE-STD-3006-93, which was issued in April 1994, provides detailed guidance for planning and conducting readiness reviews at defense nuclear facilities, other than those involved in nuclear explosives activities. The issuance of these requirements and standards is a positive action toward assuring nuclear safety throughout the operating complex.

The Board has monitored implementation of the new order across the complex. Some examples of the results of the Board's oversight appear below.

- In early 1994, the Board reviewed preparations for increased storage of pits in Zone 4 at the Pantex Plant, finding, among other things, that DOE and contractor line management had not achieved an adequate state of readiness before conducting an Operational Readiness Review (ORR) for pit storage, according to the requirements of DOE Order 5480.31. The premature ORR revealed practices needing improvement. Thus, contrary to the original intent, the ORR team functioned as an adjunct to line management, rather than as an independent check of readiness.

- This practice, which effectively nullifies the safety benefits of an independent check, was observed in a number of other cases. The Board raised this issue in a letter to the Department in April 1994. In August 1994, DOE responded by committing to provide further training to line management personnel on the readiness review process and to revising DOE Order 5480.31 to more clearly define actions in certifying readiness to operate.

- At Rocky Flats, DOE completed an Environmental Assessment for limited use of Building 707 to stabilize plutonium-bearing residues, and found no significant environmental impact. Although an ORR had been completed more than two and a half years earlier, DOE decided a reassessment was warranted. In July 1994, DOE completed that additional ORR for limited operations in Building 707. The Board reviewed the preparations for renewed calcining operations and based on its staff's report, concluded that the ORR was conducted satisfactorily, and so informed DOE in August 1994. DOE authorized resumption of the limited operations in Building 707 in December 1994.

- At the Idaho National Engineering Laboratory, the Board and its staff monitored preparations to restart the de-nitrator process at the Idaho Chemical Processing Plant. In June 1994, DOE completed an ORR. The Board found that preparations by line management and conduct of the ORR adequately demonstrated readiness to restart operations.

- The Board also monitored the process of establishing readiness to resume operation at various facilities at the Savannah River Site, including the F-Canyon, FB-Line, and the In-Tank Precipitation facilities. Preparations for restart of both F-Canyon and FB-Line in 1994 included ORRs conducted by DOE Headquarters, which identified several issues requiring resolution before restart.

- As previously stated, the Oak Ridge Y-12 Plant management had shut down most nuclear operations in late 1994 because of numerous noncompliances with safety requirements. During this hiatus, DOE chose to conduct a number of important nuclear operations at Y-12, including support for inspections by the International Atomic Energy Agency, receipt of highly enriched uranium from Kazakhstan (the SAPPHIRE project), and receipt of certain components of nuclear weapons disassembled at the Pantex Plant. In each of these cases, the Y-12 contractor prepared a special activity package describing the additional controls and actions that would be taken to ensure safety of these high priority activities during the shut-down period. The Board evaluated the review and approval process and subsequently reviewed the proposed operations. In each case, the Board saw no undue risk to health and safety of the public or workers.

- In early 1994, the Board reviewed the readiness of the LANL TA-55 Plutonium Facility to proceed with production of plutonium oxide pellets in support of NASA's Cassini Mission to Saturn. LANL and DOE did not conduct full operational readiness reviews prior to restart. They relied on what they believed to be adequate experience of the operators from previous campaigns for fabrication of similar pellets. However, to review whether the higher throughput rate required for Cassini posed a significant risk, the Board held two public meetings in March 1994. Subsequently, in reviewing compliance with procedures and safety limits, LANL management suspended production operations for two and a half months to make operational improvements. Production operations began again in late July 1994.

E. SAFETY ASPECTS OF MANAGING THE DEFENSE NUCLEAR FACILITY SYSTEM LIFE CYCLE

1. Systems Engineering Implementation

The Board has become increasingly aware that DOE does not treat interacting operations at individual sites or combinations of sites as a system whose components mutually affect each other. This point is commonly overlooked in planning of facilities, operations, and programs, and more often that not leads to unworkable results. A systems-based process attempts to optimize the solution of a complex problem by breaking the problem into component parts and then engineering component parts in the context of the whole. For example, preparation of the high level waste in the tanks at the Hanford Site for geologic disposal will require characterization, pre-treatment, vitrification, and packaging. Engineering the solutions for these complementary functions must be done in the context of the system objective; namely a stabilized waste form suitable for disposal.

During 1994, the Board reviewed systems engineering activities at several facilities including: the control of safety bases for operations at the Pantex Plant; improvements to be made in the OSR surveillance process at the TA-55 facility at LANL; and the remediation of high level waste at the Hanford and Savannah River Sites and at the Idaho National Engineering Laboratory (INEL). Systems engineering activities related to the disposition of special nuclear material and spent nuclear fuel at the Hanford Site , INEL, the Savannah River Site, and Rocky Flats were also reviewed by the Board in the past year. To date, reviews have shown that these various DOE activities have been largely unsatisfactory. In general, the Board has noted that DOE has not consistently taken a formalized systems approach to solving safety, technical, and managerial problems.

A complex-wide DOE standard that formalizes the method would help. The need for better guidance on systems engineering was apparent during a number of the Board's reviews in 1994. Several examples are provided below.

> On two occasions, in April and May, the Board informed DOE of what it considered to be inadequacies in design basis information involving systems serving safety functions, configuration management, and flow-through of technical requirements to operational procedures at the Pantex Plant and at LANL. Subsequently, DOE elected to curtail operations at the Pantex Plant and at LANL's TA-55 facility for extended periods.
>
> As part of the Tank Waste Remediation System (TWRS) at the Hanford Site, DOE announced its intention to build additional one-million gallon, double-shell tanks as major elements of the Multi-functional Waste Tank Facility (MWTF). The Board's review of the process of design of

these tanks, both in the managerial and technical areas, resulted in the issuance of Recommendation 92-4[3] calling for a systems engineering approach to the design, construction, operation, and eventual decommissioning of the MWTF. DOE has made some progress toward use of systems engineering for project development within the TWRS. However, at the end of 1994, it was still not being fully used by DOE. It was not used to decide whether new tanks are really needed, how many there should be, and how large they should be.

The use of systems engineering by DOE's Office of Spent Nuclear Fuel (EM-37) has evolved from a series of DOE-sponsored workshops, site meetings and site activities during 1994. This has resulted in the development of functional requirements at a high enough level to ensure some consistency across the defense nuclear complex. However, during a recent visit to the Savannah River Site, it was observed that both ongoing and planned contractor projects supporting the storage and processing of spent fuel are not linked to the Spent Nuclear Fuel Systems Engineering Program. The situation resembles that with the TWRS described above. There seem to be no near-term plans to integrate the Spent Nuclear Fuel Systems Engineering Program with current spent nuclear fuel projects in the field.

Failure to use a systems approach in planning can lead to greatly increased cost, delays, inferior solutions to problems, and even inability to solve some problems. The Board will continue to emphasize the need for a systems engineering approach in these and other projects in the complex.

As part of its efforts to streamline project development, DOE is revising DOE Order 4700.1, dealing with systems management. The Board has reviewed initial drafts of the revised order and has provided its comments to DOE regarding needed improvements to address the problems noted above. All these activities are ongoing and have had or will have significant impact on operations or decommissioning of numerous DOE facilities.

2. Seismic and Other External Hazards Mitigation

During 1994, the Board's review of seismic hazards focused on the design adequacy of key facilities in DOE's nuclear materials storage and waste management. Reviews continued of the design basis adequacy of the In-Tank Precipitation Facility (ITP), the H-Area Waste Tank Farms, and the Defense Waste Processing Facility (DWPF)

[3] See Appendix A.

at the Savannah River Site; the Tank Waste Remediation System at the Hanford Site; the spent fuel storage basins at the Idaho Chemical Processing Plant; and Building 371 at Rocky Flats. The adequacy of the Chemistry and Metallurgy Research Laboratory (TA-3) and the Plutonium Facility (TA-55) at Los Alamos National Laboratory were also reviewed, and a November 1994 letter was accordingly sent to DOE requesting a report concerning design practices at LANL.

Based on its review of the seismic aspects of DOE's efforts to consolidate the large inventory of plutonium and highly enriched uranium at Rocky Flats into a single building, the Board concluded that DOE's ongoing activities to better identify and respond to potential hazards from natural phenomena were not well integrated. The activities were not logically structured or sufficiently encompassing in either detail or scope to assure protection of public health and safety.

In September 1994, the Board issued Recommendation 94-3,[4] calling for a systems approach to the design basis for Building 371 at Rocky Flats and the safety concerns associated with the increased storage of special nuclear material in this facility. The Secretary has accepted the Board's recommendation, and the Department is currently developing an Implementation Plan.

Since the types and magnitudes of potential earthquakes act as important driving forces on facility design and modification decisions, the Board continues to monitor efforts to characterize earthquake ground motion at the Hanford Site, INEL, LANL, Rocky Flats, the Oak Ridge Reservation, and the Savannah River Site. The Board has raised questions regarding the emphasis DOE places on probabilistic methods for characterizing earthquake ground motion, without concurrently reconciling that methodology to the analytical procedures used successfully in the commercial nuclear power program. Probabilistic methods have been changing rapidly, with new and untested assumptions and extrapolations being introduced. Validation of these models will require time and experience. The Board is examining and has questioned the use of probabilistic methods in lieu of the deterministic approach used by the commercial nuclear industry.

The Board intends to continue to work with DOE on these matters during 1995.

3. Criticality Safety

In Recommendation 93-2, the Board recommended that DOE retain its program of criticality experiments to improve the criticality data base and to serve in training the community of criticality engineers. The Department responded positively to this recommendation. DOE chose the Los Alamos Critical Experiments Facility (LACEF) for

[4] See Appendix A.

this purpose and formed a Nuclear Criticality Steering Committee to provide guidance in responding to Recommendation 93-2. DOE identified projected funding and experiments for execution through Fiscal Year 1995 and summarized the significant accomplishments in an annual report on the status of the program. The Board will continue to review the adequacy of future funding for criticality experiments and criticality engineer training, as well as the operation of the LACEF in general.

In late September 1994, after draining low-concentration plutonium solution from a storage tank, an operator in Building 771 at Rocky Flats drained solution from another tank, outside the scope of the procedure. As a result, about five liters of highly concentrated plutonium solution were collected in a potentially unsafe geometry. Although criticality did not occur, this action defeated the controls that had been put in place to prevent a nuclear criticality accident. Following this event, the Rocky Flats plant contractor suspended tank draining operations as well as a number of other operations that involve the handling of special nuclear material. In November 1994, the Board requested that DOE address the issues raised in Board Recommendation 94-4 as applicable to this criticality infraction and provide a report within 60 days. At the end of the year, the suspension was still in effect, and DOE was preparing its response to the Board's request for a report.

4. Safety Analysis of Site Operations

The Board continued to review the technical adequacy of Safety Analysis Reports (SAR's) of DOE facilities. During 1993, the Board's review of analyses of potential aircraft crashes at defense nuclear facilities indicated that the methodologies employed in these studies vary significantly from site to site. It was seen that the differences resulted from lack of uniform guidance by DOE. Within the past year, DOE has initiated the development of a consensus standard to address this deficiency.

In October 1993, the Board requested that DOE prepare a report providing additional information on several technical issues concerning military overflights of the Pantex Plant and the methodology used for evaluation of the impact of an aircraft crash into the Pantex Plant Zone 4 storage magazines. The Board reviewed DOE's report and questioned the validity of the Pantex Plant's analysis in a letter to the Department in June 1994, and requested that a safety evaluation be conducted using methodology prescribed in DOE Order 5480.21, *Unreviewed Safety Questions*. DOE addressed the issues raised by the Board and found errors in the calculations of the probability of an aircraft crash into Zone 4.

A cooperative activity by DOE, the City of Amarillo, the U.S. Air Force, and the Federal Aviation Administration (FAA) resulted in an agreement to reduce the number of aircraft overflights of the Pantex Plant significantly during the next five years.

The Board has reviewed safety analyses for several other DOE defense nuclear facilities, including separations facilities, and the high-level waste storage and processing facilities at the Savannah River Site (SRS). Several of these facilities are scheduled to begin operations in 1995.

The Board conducted several reviews of the safety of the F-Canyon and FB-Line. These reviews resulted in the implementation of additional safety measures and the upgrade of existing safety analysis documentation. Some of the specific measures include: (1) isolation of Tank 17.1, which contains highly radioactive americium and curium solutions, to reduce the risk of release to the environment; (2) upgrade of capabilities to monitor the activity of cooling water to reduce the risk of a release to the environment; (3) reclassification of the process vessel vent system to provide additional controls to prevent the accumulation of flammable gas; and (4) modification of the 3rd and 4th level ventilation systems at the FB-Line to prevent unmitigated releases during a fire. The F-Canyon restarted second plutonium cycle operations in February 1995 and the FB-Line is scheduled to restart in April 1995.

The Board reviewed the safety analysis for the In-Tank Precipitation (ITP) Facility and questioned the adequacy of several key assumptions related to the rates of benzene generation and the degree of mixing. These assumptions had led to a DOE conclusion that a flammable vapor mixture could not form in the tank headspace under either normal or abnormal conditions. In response to the Board's questions, DOE implemented a program to validate the assumptions made in the safety analysis. This program includes the development of a computer simulation of the tank headspace to determine the degree of mixing during normal and abnormal conditions (e.g., loss of ventilation). The results of this analysis will be validated by a test program prior to initial startup of the ITP, scheduled in July 1995.

The Board has monitored the startup test program for the Defense Waste Processing Facility (DWPF) and has reviewed the safety of process operations. The design and classification of safety systems that control and prevent the formation of flammable vapor mixtures in several process operations were questioned. In response to the Board's questions and DOE's own independent oversight findings, DOE reassessed the design and classification of these safety systems. The need for several significant upgrades has been identified (e.g., backup inert gas purging systems). These will result in a significant reduction of the risk to the workers and public. Board reviews also led to comprehensive reassessment of the facility, integration of required research and development efforts, and significant improvements in conduct of operations, operator training, control system design, and mitigation of process hazards. DWPF is scheduled to start up in December 1995.

DOE has explored the concept of risk acceptance in its safety management programs. This is a potential departure from the deterministic approach based on

engineering disciplines traditionally used in safety assessments in the commercial nuclear industry as well as in the military weapons safety program. The Board has held numerous discussions with DOE about the use of risk assessment and its acceptance in safety management, particularly where data for probability estimates are lacking. The Board continues to encourage DOE to make maximum use of deterministic analysis coupled with defense-in-depth mitigation of accidents and hazards, while looking to risk determination as additional confirmatory information for use in the Department's safety management programs.

III. ADMINISTRATIVE MATTERS

A. PERSONNEL RECRUITMENT

As of December 31, 1994, the Board had 100 full-time employees including two full-time Site Representatives at the Department of Energy's Pantex Plant, near Amarillo, Texas, and one Site Representative at the Hanford Site, in Richland, Washington.

The Board's technical staff includes individuals with extensive backgrounds in nuclear, mechanical, electrical, chemical, structural, and metallurgical engineering; and physics. As an indication of the Board's technical talent, 19 percent of the technical staff hold degrees at the Ph.D. level and an additional 63 percent have Masters degrees. Moreover, 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 weapon field, or the civilian reactor industry. Five other senior members of the Board's staff have law degrees (JD), as well as degrees in a technical specialty. Both the Board and staff include persons experienced in environmental impact assessments and regulatory processes.

In 1994, the Board successfully recruited personnel with broad nuclear weapons experience. A number of staff members completed special courses in weapons design and construction. This expertise was supplemented by outside experts with extensive experience with plutonium processing and weapons assembly and disassembly. The Board plans to continue its aggressive program to attract and hire additional technical staff with backgrounds commensurate with the Board's public health and safety responsibilities.

There are currently 10 interns in various phases of a 3-year training program. The recruitment and selection methods used have proven very effective based on the outstanding academic and on-the-job performance of interns. Board staffing projections include the recruitment of four technical interns in 1995.

B. PUBLIC HEARINGS, PUBLIC COMMENT, AND INTERACTION WITH BOARD

During 1994, Board Members visited defense nuclear sites on 20 occasions, where they met with contractors, DOE representatives, members of the public, labor unions, and public interest groups. The Board conducted twelve public meetings, hearings, and briefings at various sites throughout the country. The Board made extensive efforts to include and inform the public of Board activities in 1994, as follows:

- Individual Written Notices of Public Meetings, Hearings, and Briefings 2,750

- Individual Written Notices of Board Recommendations to the Secretary of Energy 1,325

- Responses to Inquiries from the Public and News Media 425

C. OFFICIAL SITE VISITS BY BOARD MEMBERS AND BY STAFF

From the establishment of the Board in October 1989, through December 31, 1994, Members of the Board, its staff, and its contractor experts had collectively made 689 site visits to DOE's defense nuclear facilities. In 1994 alone, 216 site visits were made to DOE's defense nuclear facilities by Board members, staff, and outside experts. These visits focused primarily on selected facilities that both the Board and DOE consider to be most pressing in light of DOE's mission.

The Board reviewed firsthand the health and safety issues at each of these sites. During visits to DOE sites, the Board gathered information relevant to its recommendations to the Secretary of Energy and monitored the implementation of recommendations that have already been made.

D. NATIONAL PERFORMANCE REVIEW (NPR) STREAMLINING INITIATIVES

The Board believes that this new agency, not encumbered by years of bureaucratic rules, regulations, and practices, has already accomplished many of the streamlining objectives of the NPR. At its inception, the Board's executive leadership recognized the importance of carefully structuring an organization to avoid layering, to promote empowerment, and encourage timely action. Using this philosophy, the Board focused its early attention to the following key organizational elements:

Starting Without Encumbrances

- As a new agency, the Board did not inherit any staff, organizational structure, or internal regulations governing the conduct of business. Therefore, the Board was free to create a lean organization tailored to its specialized scientific and technical mission, without the encumbrances often associated with traditional government operations such as, vertical layering, excessive administrative support, and duplication of function. The simple structure of the technical staff ensures ability to use all technical staff members in an optimum way to deal with each new topic the Board takes up.

Reducing Regulatory Burden

- The Board's policy on regulations is fully consistent with the President's memorandum on streamlining the bureaucracy. To date, the Board has promulgated only those regulations necessary to maintain orderly operations -- Freedom of Information Act, Privacy Act, Government in the Sunshine Act, and Organizational and Consultant Conflicts of Interests. Moreover, in promulgating these regulations, the Board has written the rules in ways that achieve the statutory purposes without burdening the Board with inflexibility, or overly-prescriptive requirements that attempt to substitute detailed paperwork for sound judgment.

"Excepted Service" and Pay for Performance

- The Board successfully argued for, and subsequently received through legislation and administrative delegations, the means to overcome many of the administrative road blocks that have traditionally frustrated change in government organizations. Most prominent in this list of specific statutory authorities sought by the Board and ultimately granted by the Congress is the "Excepted Service" personnel authority.

  The pay banding and pay for performance concepts recommended in the NPR have been operational at the Board for more than three years and have received favorable review by the General Accounting Office. These concepts have proven to be very effective in hiring technical talent, holding employees accountable for their performance, and rewarding outstanding performance on the job.

"No frills" Approach to Operations

- From the first day of operation, the Board Members have set the standard for having a "no frills" approach to conducting Board business. Administrative expenses are carefully reviewed for absolute necessity before expenditures are allowed. For example, the Board does not own or lease automobiles. It does not employ chauffeurs and it has carefully enforced the Federal Travel Regulations, including the restrictions on the use of first-class and business-class travel. These internal policies have been in place since its inception with no adverse impact on operations. Internal directives were written to give practical guidance in the most simplified manner.

Effective Organization Structure

- The Board maintains focus on its mission respecting the adequate protection of public and worker health and safety at DOE defense nuclear facilities. Using a matrix form of organization, the Board gained management flexibility and avoided

the need to establish layers of middle management that divert limited staff resources from performing health and safety reviews.

Adopting the "economies of scale" philosophy for obtaining needed administrative support services, the Board negotiated Interagency Agreements with the U.S. Nuclear Regulatory Commission, the National Science Foundation, the Public Health Service and the General Services Administration to obtain immediate support for accounting, procurement, personnel, and payroll services. Resources that normally are diverted to these administrative functions remain dedicated to the health and safety mission.

Management Continuity

- Under the Board's enabling legislation, the five Members are appointed to staggered five-year terms on a full-time basis. Thus, the Board has enjoyed management continuity and has not been subjected to the disruption resulting from frequent changes in leadership experienced by many government agencies. From the first day of operation, the Board has had precise and consistent direction of the conduct of its technical mission and major policy issues.

Experienced Leadership

- Building an organization from its statutory foundation offers a special management challenge requiring individuals with good planning skills, organization skills, and detailed knowledge of a wide range of Federal government policies and practices. The Board successfully recruited a small senior management staff with demonstrated management experience and proven accomplishments.

  Using their collective knowledge of government operations, the senior management staff helped to plan and implement an organizational structure that maximizes the effectiveness of the scientific and technical resources available to the Board and avoids layers of management.

Information Technology

- The Board has encouraged the full use of today's advanced computer capabilities by investing in state-of-the-art hardware and software. Staff members use their desk top computers to obtain the latest information on events at defense nuclear sites; review a data base of more than 1,000,000 pages of technical documents received by the Board on defense nuclear facilities; access Federal Register notices and legal decisions; and electronically send draft reports to colleagues for review. Expert consultants, engineers on travel, and site representatives send and receive

electronic communications through remote access to the Board's local area network.

During FY 1994, the Board became the first agency serviced by GSA to switch from manual time and attendance reporting to a fully automated system -- the Electronic Time and Attendance Management System (ETAMS). This automated system improves accuracy and speeds reporting. Automation initiatives such as these have offset the need for additional administrative and clerical staff through efficiency gains.

In FY 1995, the Board plans to further investigate the use of electronic commerce. The Board's staff has met three times with senior members of the Electronic Commerce Acquisition Team (ECAT) to determine if there is an economical way for the Board to apply this initiative given the small size of the agency and the limited number of procurements generated each year.

Accountability vs. Excessive Controls

- Small organizations such as this Board cannot afford to waste scarce resources establishing layers of internal management. The Board believes that the foundation for a strong, effective program to prevent fraud, waste, and abuse of government property and funds begins with the line managers responsible for overall program administration.

  An independent review of the organization structure and management of the Board conducted by the Institute of Public Administration recognized the significant progress and accomplishments made by the Board in establishing a streamlined structure with a minimal commitment of resources. Also, a recent independent audit of the Board's administrative operation by Gardiner, Kamya & Associates, a private accounting firm, confirmed that a reliable and workable system of management controls operates as an integral part of the Board's administrative systems.

Customer Service

- In the Board's public health and safety reviews, contacts with the public are primarily through open hearings and access to the Board's public reading room. Since 1990, the Board has held 38 public hearings at sites across the nation and in Washington, D.C. The public reading room is open to the public every working day and the staff has received many complimentary letters from private citizens, public interest groups, corporations, and other government agencies.

To expand public access to its records and deliberations, the Board has established a bulletin board on the INTERNET that lists, among other things, the full text of every recommendation made by the Board to the Secretary of Energy, and staff trip reports are being added. This bulletin board was established in July 1994. More than 7,000 callers had accessed the files offered to the public for inspection, and more than 2,500 copies had been made of the files available on the bulletin board, as of January 1995.

This automation initiative has empowered the staff to be more self sufficient and productive while ensuring that the public's information needs are better served.

IV. PLANNED FOCUS OF BOARD ACTIVITIES IN 1995

As noted in last year's Annual Report, protecting the health and safety of the public, and especially of on-site workers because of their proximity to any hazards, becomes more challenging as additional defense nuclear facilities make the transition from production, while others remain in operation or are restarted. As facilities cease production and enter the transition and decommissioning phases, hazardous operations will likely increase. This is so because new tasks will be performed involving materials and equipment in degraded form. The significant issues in this area remain as they existed a year ago, including:

- the necessity of operating obsolete or shut-down processing facilities for short periods to remove in-process radioactive or hazardous materials;

- surmounting technical problems associated with existing high-level radioactive waste storage tanks;

- design, construction and startup of new facilities for interim and long-term storage of wastes;

- elimination of corroding spent fuel, even though facilities normally used to process the fuel are shut down; and

- the need for safe decommissioning of a number of major nuclear facilities.

In the weapons-related areas, the technical challenges facing DOE and the Board will require adjustment as DOE's plans for the complex change. Major weapons-related issues requiring continuing attention include:

- safe dismantlement of approximately 2,000 nuclear weapons per year in accordance with improved, standards-based methods;

- the requirement to provide substantially increased capacity for the safe storage of weapons-grade plutonium, enriched uranium, and other nuclear materials removed from weapons; and

- the necessity for continuing detailed review of DOE's resizing of the weapons complex, and its use of the Stockpile Management and Stockpile Stewardship programs to ensure that nuclear safety is retained.

A. COMPLEX-WIDE SAFETY ISSUES REQUIRING PRIORITY ATTENTION IN 1995

Within the broad context depicted above, the Board plans to continue its emphasis on a number of safety issues across the defense nuclear complex. As in 1994, these include the need for the Board to:

- continue to urge development and implementation of safety-related orders, standards, and guides; to assess their adequacy; and to ascertain compliance;
- insist on DOE's adoption of systems engineering methods in developing and managing projects and programs;
- oversee DOE's upgrading of technical capabilities and expertise;
- help to instill continued improvement in conduct of operations by DOE and its contractors;
- oversee the safe dismantlement and storage of weapons and weapons components;
- draw attention to the need for DOE to provide prompt, long-term, and safe processing, packaging and storage of plutonium-bearing materials;
- pursue DOE's program for resolving ongoing safety issues associated with corrosion and storage of spent fuel;
- help to ensure that DOE pursues excellence in the radiation protection program; and
- oversee the safe handling and disposition of nuclear waste materials and the control of releases to the environment.

B. SITE-SPECIFIC SAFETY ISSUES REQUIRING PRIORITY ATTENTION IN 1995

As to each of the facility-specific issues and activities listed below, the Board will (1) evaluate DOE program plans and safety analyses, (2) conduct onsite inspections as needed of implementation, and (3) take action as needed to help to ensure the protection of public health and safety and the safety of workers:

Fernald

- Safe stabilization of uranyl nitrate hexahydrate solutions.

- Implementation of the requirements of Recommendation 93-4 regarding technical management of this particular Environmental Management Restoration Contract.

Hanford Site

- Characterization of high level nuclear waste in tank farms, and integration of overall Tank Waste Remediation System efforts using accepted systems engineering principles, including effective implementation of Recommendations 90-7, 92-4, and 93-5.

- Clean up of corroding fuel in the K-East Basin, and removal of in-process hazardous material from PFP systems.

Idaho National Engineering Laboratory

- Upgrading of ICPP fuel basins and associated safety bases.

- Disposition of remaining reprocessing solutions at the ICPP and review of safe storage of calcined waste.

- Safety of the Advanced Test Reactor (ATR).

Mound Site

- Unloading of tritium reservoirs, including readiness reviews, and the repackaging of uranium and plutonium materials in response to Recommendation 94-1.

National Weapon Laboratories

- Programs for ensuring safety of defense nuclear-related research and development activities.

- Revised safety analyses of facilities, with particular emphasis on analysis for seismic hazards at Los Alamos National Laboratory and Lawrence Livermore National Laboratory.

Nevada Test Site

- Establishment of a comprehensive process to prepare for and evaluate nuclear test readiness, including implementation of Recommendations 92-6 and 93-6.

- The design basis and the operational readiness of the new Device Assembly Facility.

Oak Ridge

- Conduct of operations and criticality safety at the Y-12 Plant, in response to Recommendation 94-4.

- Adequacy of nuclear material storage.

Pantex Plant

- Design and safety basis for the new Special Nuclear Material Staging facility.

- New and upgraded safety analyses to ensure technical adequacy.

- Revised requirements on overflights and analysis of safety of overflights.

Rocky Flats

- Processing and storage of various forms of special nuclear material to meet the requirements of Recommendation 94-1.

- Implementation of Recommendation 94-3 for systematically evaluating the design of Building 371 for the storage of SNM.

Savannah River Site

- Start up and operation of F-Canyon, FB-Line, H-Canyon, HB-Line and spent fuel storage basins, to stabilize various forms of SNM.

- Safety basis and readiness for startup of ITP and DWPF.

West Valley

- Startup and operation of the high-level waste vitrification facility.

PART 2

5TH YEAR REPORT
EXECUTIVE SUMMARY

I. EXECUTIVE SUMMARY

A. SPECIAL REQUIREMENTS FOR BOARD'S FIFTH ANNUAL REPORT TO CONGRESS

Each year the Board reports to Congress on the status of its activities during the past year related to health and safety at defense nuclear facilities and on the Department of Energy's progress in improving safety at those facilities. That report, which also focuses upon Board recommendations issued during 1994, was presented in Part 1. By statute, the Board in its fifth annual report must address three special issues in addition to those presented in a routine annual report. These issues are:

- an assessment of the degree to which the overall administration of the Board is believed to meet the objectives of Congress in establishing the Board;

- recommendations for continuation, termination, or modification of the Board's functions and programs, including recommendations for transition to some other independent oversight arrangement if it is advisable; and

- recommendations for appropriate transition requirements in the event that modifications are recommended.

B. BOARD PROCEDURES AND ACTIONS TAKEN TO MEET THE CONGRESSIONAL REPORTING REQUIREMENT

To prepare the assessments and recommendations on the special issues as requested by Congress, the Board asked, and answered, a number of fundamental questions, including:

- What were the principal Congressional objectives in establishing the Board?

- How well had the Board satisfied those objectives in its first five years?

- Would modification in the Board's operation or in its enabling statute improve the Board's oversight effectiveness?

- Are changes in the Board's jurisdiction over defense nuclear facilities necessary to reflect major changes in the defense nuclear complex?

- Is an even more fundamental change needed, such as conversion to a regulatory agency or licensing body?

- How are DOE line and oversight organizations responding to health and safety problems, with and without Board intervention?

- Are DOE's nuclear safety program and internal oversight enforcement units properly organized and staffed to meet the health and safety challenges of a defense nuclear complex in the throes of major and rapid change?

To answer these and other questions necessary to provide the information and recommendations for the fifth annual report, the Board engaged in a number of tasks, including the following.

1. Mandatory Reporting Requirements Related to the Fifth Annual Report

On May 6, 1994, the Board imposed a major reporting requirement on DOE to provide needed information on the status of its current nuclear safety programs and on the DOE organizational roles and responsibilities for health and safety at defense nuclear facilities. DOE submitted its final report on October 21, 1994.

2. Research and Documentary Information Gathering

The Board collected and analyzed a large amount of existing information related to DOE's line and oversight safety programs, the Board's oversight of safety at defense nuclear facilities, and the fate of defense nuclear programs (e.g., their reconfiguration or possible transfer to an independent agency). The documents used in the development of this report are listed in Appendix B.

3. Briefings

High-level DOE officials briefed the Board on current plans for oversight, regulation, and enforcement of safety requirements throughout the DOE complex. These briefings were a continuation of past and ongoing discussions by the Board with DOE on topics including identification of DOE roles and responsibilities for safety, Office of Environmental Safety and Health (EH) oversight capability, order compliance, and other safety issues.

4. Public Hearings

To ensure that all interested groups, government officials, and individuals had an opportunity to be heard from on the special issues to be addressed by the Board in the fifth annual report, the Board conducted a series of hearings in the fall of 1994 at locations in the vicinity of the principal defense nuclear facilities. Written comments also

were sought and accepted. Hearings were noticed in the Federal Register and were advertised in local newspapers. Specifically, the Board sought information on:

- What changes, if any, should be made in the Board's operations and enabling statute to enhance its oversight capability;
- Is regulatory/licensing authority necessary or prudent; and
- Is DOE able to self-regulate, oversee safety and enforce safety requirements?

Transcripts of the hearings were copied and disseminated to the sites and placed on file in the Board's public reading room for public review. Comments, written and oral, were documented and analyzed for incorporation by the Board into the final report. The Board also obtained oral briefings and written comments from individuals and groups recognized by the Board as having nuclear safety expertise.

5. Hearings With Secretary of Energy and Selected Expert Witnesses

On December 6, 1994, the Board held a public hearing with the Secretary of Energy as the principal witness. The Secretary testified on issues relevant to this report, such as ways in which DOE viewed the Board as effective in assisting DOE in identifying and resolving health and safety issues. Testimony also was given by the Under Secretary and several Assistant Secretaries who responded to Board questioning.

6. Determination of How Well the Board Met Congressional Expectations

The Board identified Congressional expectations for Board performance by analyzing its enabling statute, its legislative history, and other statutes, and by participating in hearings before Congress. The Board annually compared its accomplishments to the expectations and identified areas where accomplishments met, exceeded, or fell short of expectations. In those areas where the Board believed the expectations had not been met fully, the Board endeavored to determine the cause or causes. The possible causes in each case included, as a logical matter: DOE's failure to adequately respond to Board recommendations or activities; delays, or imposition of other impediments; inadequacies in the methods used by the Board; inherent limitations in the Board's statutory authority to effectuate change; lack of DOE resources or other unforeseen difficulties; or some combination of these and other factors. Assessments of efforts to meet expectations are presented in Part 2, Section III.

7. Oversight Options

The Board evaluated a wide range of safety oversight options for defense nuclear facilities in the process of developing this fifth annual report to Congress. These options range from strictly advisory, to "action-forcing" recommendations, to mandatory directives, to regulation, and finally to licensing. The implications of each of the following options are discussed in detail in Part 2, Section IV.

- Withdraw the Board's statutory oversight responsibilities. Return to the condition prior to establishment of the Board. Action would result in no external nuclear health and safety oversight.

- No action option: Continue the Board's enabling statute and methods of operation unchanged.

- Options for improvement of Board effectiveness which do not require statutory amendment:

  (1) Engage high-level DOE officials in correcting safety deficiencies, and maintain their focused attention until implementation plans are completed;

  (2) Make better use of statutory tools currently available to the Board, such as formal hearings, to foster accountability, and more expeditious implementation of Board recommendations and safety improvements; and

  (3) Improve Board's programs for informing and involving the public.

- Options for modifying the Board's enabling statute to cure specific problems identified during the first five years and to prevent delays in DOE's implementation of Board recommendations. Changes considered by the Board include:

  (1) Shortening the statutory period allowed for DOE responses to Board recommendations and the period allocated for development of an implementation plan once a recommendation is accepted;

  (2) Mandatory Board review or certification of the qualifications of key nuclear safety personnel;

  (3) Explicit Board authority to stop work, based on safety considerations, without resort to the recommendation process;

(4) Board approval required for startup of new facility or restart of old ones, similar in principle to its current responsibility at Rocky Flats for restart of plutonium operations;

(5) Authority for the Board to either approve or set safety standards, not just propose them;

(6) Incorporation of DOE implementation plan commitments for accepted Board recommendations into the contracts of M&O and other contractors; and

(7) Addition of authority which would allow the Board to mandate corrective action for safety problems identified in Board recommendations.

- Major revision to Board's enabling statute: Retain Board structure but re-orient from advisory/recommendation format to another such as:

(1) Regulatory authority, with enforcement powers, but without licensing authority; and

(2) Regulatory and licensing authority.

- Authorize an existing agency, such as NRC or EPA, or establish a new agency to regulate DOE.

- Establishment of a new agency with single administrator or headed by a Commission to undertake any or all of the above.

8. Board Deliberation and Preparation of Final Report

The Board reviewed the available information and staff analyses and proceeded with individual discussions, briefings, and deliberations on viable oversight options. The recommended options in the Board's final report are accompanied by the Board's reasons for recommending the options to Congress.

C. ASSESSMENT OF HOW WELL THE BOARD MET CONGRESSIONAL OBJECTIVES

The Board identified Congress' objectives by analysis of the Board's enabling statute and its legislative history, hearings conducted subsequent to the establishment of the Board, and other supporting documentation. Conclusions as to the Board's success in meeting those objectives called for self-assessment and judgment, which unavoidably

involve subjective opinions about which reasonable minds can differ. The appropriate starting point of this analysis is an assessment of the effectiveness of the safety recommendation process itself.

1. Ensuring Adequate Protection Through Effective Use of Board Recommendations

CONGRESSIONAL OBJECTIVE: The Board is to assist DOE in improving safety at defense nuclear facilities by identifying potential public health and safety issues, recommending actions to the highest levels of the Federal government to prevent or remediate threats to safety or actual damage, and monitoring the accomplishment of such corrective actions.

The recommendation process is central to the Board's oversight of public health and safety at defense nuclear facilities. The statute requires the Board to "make such recommendations to the Secretary of Energy [or in the case of imminent or severe risk, to the President] . . . as the Board determines are necessary to ensure adequate protection of public health and safety." 42 U.S.C. §§ 2286a(a)(5) and 2286d(g)(1). The Secretary of Energy must accept or reject all or part of the Board's recommendations within forty-five days (unless extended) after publication in the Federal Register. DOE must then transmit an implementation plan for the accepted portions of the recommendations to the Board within ninety days (unless extended) after publication of DOE's acceptance (135 days with extension). The average amount of time to transmit an acceptable plan has been 225 days.

To date, the Board has issued 31 sets of recommendations to the Secretary of Energy, containing 139 individual specific recommendations. The Secretary of Energy has accepted all of the recommendations in the Board's first five years of operation, with the exception of the most recent one dated December 30, 1994, which is in the process of being reviewed by DOE. Ten sets of recommendations have either been fully implemented or have been superseded or consolidated with subsequent recommendations. The remaining 21 are in various stages of implementation.

As a result of the Board's efforts, substantial nuclear safety improvements have been made in fundamental areas at defense nuclear facilities after DOE acceptance and implementation of Board safety recommendations. These areas include operational readiness reviews; compliance with safety standards, orders and requirements at certain facilities; technical training at DOE sites; discipline of operations; the safe handling of nuclear materials; and radiation protection. The Secretary corroborated this finding in testimony before the Board on December 6, 1994. She stated that the Board had assisted the Department in identifying and correcting public health and safety deficiencies at defense nuclear facilities in key areas including: compliance with DOE safety

requirements including Orders; hiring, retention, education, and training of qualified DOE technical personnel; readying facilities to operate safely, and conduct of operations. However, this progress notwithstanding, the Board believes the pace has been slower than had been anticipated, especially in raising the level of technical competence of DOE personnel.

The Board's recommendation process for effectuating safety improvements at defense nuclear facilities has proven to be sound in achieving its stated objectives. However, the ultimate goal of the recommendation process to improve the safety status of defense nuclear facilities is susceptible to delays, sometimes major ones. The problems are most apparent when DOE should take corrective action, or delays doing so in a timely fashion, and the Board is unable to compel the actions necessary. However, as will be summarized, the Board believes that its currently available statutory tools are sufficient to counteract such difficulties in the recommendation process.

2. Foster the Development and Implementation of Adequate DOE Safety Standards Including Orders, Rules, and Other Requirements

CONGRESSIONAL OBJECTIVE: One of the Board's principal functions is to assist DOE's development and implementation of appropriate and operationally meaningful safety standards (including orders, regulations and other requirements) at defense nuclear facilities. Congress challenged the Board and DOE to achieve the safety goal of "comparability" between DOE standards and those applied to commercial facilities. S. Rep. No. 232, 100th Cong., 1st Sess. 10, 20-21, 23 (1987).

Congress highlighted the importance of this function by listing it first among the Board's duties. Moreover, it is the only discrete function of the Board which explicitly contains Congressional illustrations of subject matter suitable for recommendations. Section 312(a)(1) of the Board's enabling statute provides that the Board shall:

- Review and evaluate standards relating to the design, construction, operation, and decommissioning of defense nuclear facilities,
- Recommend specific measures to ensure that public health and safety are adequately protected, and
- Recommend necessary changes in the content and implementation of such standards, and identify areas where additional data or additional research are needed.

For decades prior to establishment of the Board, DOE and its predecessors fell far behind the Naval Reactors Program and the commercial nuclear power industry in the

effective use of nuclear safety standards. As a result of stressing the need for standards-based operations, the Board has had a substantial constructive effect in bringing about a basic change in DOE's development and use of standards, including DOE Safety Orders, rules, and other nuclear safety requirements to ensure the safety of defense nuclear facilities.

Consistent with its congressional mandate, the Board has caused the deficiency in DOE's standards program to be addressed, both with respect to DOE attitudes and practices. The sheer magnitude and pervasive nature of the problem leads to a need to continue the pressure for change into the future. As is no doubt inevitable, the Board continues to encounter some resistance to acceptance of a requirements-based safety program.

In Recommendation 90-2, the Board asked DOE to identify its applicable safety standards, assess them for adequacy, and cause full implementation of safety standards in the field. At this point, five years after the issuance of Recommendation 90-2, the process of issuing and implementing Standards Requirements Identification Documents (SRIDs) that list the requirements for specific facilities, is proceeding very slowly. Since 1990, the Board has issued a number of additional recommendations regarding DOE safety requirements that address this key problem area. Most recently, the Board issued Recommendation 94-5, which asked DOE to avoid delays in developing and implementing requirements-based safety programs while integrating safety rules, orders, and other requirements. The Board will continue to emphasize the need for issuance of SRIDs at defense nuclear facilities, and review of conformance to the commitments so made, as the principal method of discharging this requirement of its enabling statute.

3. Raise the Technical Expertise and Vigor of DOE Substantially, and Help Develop and Monitor DOE's Internal EH Organization

CONGRESSIONAL MANDATE: The lack of a sufficient number of technically qualified program and oversight officials underlies all of the health and safety problems at defense nuclear facilities. Recognizing this, Congress, in its report of the Senate Armed Services Committee on S. 1085, stated that the Board is expected to raise the technical expertise of the Department substantially, to assist and monitor the continued development of DOE's internal Environmental Safety and Health organization, and to provide independent advice to the Secretary. Congress expected the Board to raise the level of critical expertise, technical vigor, and a sense of vigilance within the Department at all levels. S. Rep. No. 232, 100th Cong., 1st Sess. 10, 20-21 (1987).

Applicable requirements of the Board's enabling statute implicitly mandate that the Board address the technical competence of DOE's personnel. For example, the Board is required to (1) review the content and implementation of safety standards and

(2) investigate events or practices which either adversely affect or have the potential of adversely affecting public health or safety. 42 U.S.C. § 2286a. To be effective, these Board reviews must consider the technical competencies of those who develop and implement safety standards and procedures.

In each of its first four annual reports, the Board recognized that the most important and far-reaching problem affecting the safety of DOE defense nuclear facilities is the difficulty in attracting and retaining personnel who are technically qualified to provide the management, direction, and guidance essential for safe operation of DOE defense nuclear facilities. It remains the most critical problem today. The Board, in its fourth annual report to Congress, attributed this, in part, to DOE's lack of excepted appointment authority for technical personnel. A notable step forward occurred last year when Congress granted DOE a measure of excepted service hiring authority. DOE now has excepted service authority for four hundred technical personnel.[1] DOE made further progress by establishing a centralized technical intern program.

On the other hand, little progress has been made in the area of actually recruiting and hiring qualified technical personnel for line and oversight positions in the office of the Assistant Secretary for Defense Programs (DP). The offices of the Assistant Secretaries for Environmental Management (EM) and for Environment, Safety, and Health (EH) have been recruiting and hiring, but it is still unclear what percentage of new hires will be devoted to technical positions involved with nuclear safety. Excepted service authority has been little used to date. Recommendation 93-3, which deals with the issues of hiring, educating, and training technical personnel, remains essentially unimplemented.

While preparing the Implementation Plan for Recommendation 93-3, DOE officials stated a preference for attempting to cure technical deficiencies by education and training of the existing workforce as opposed to hiring new talent. Although DOE's preference appears to be even stronger due to personnel reductions imposed on the Department, progress on training and education lags. While the Board has issued a number of recommendations (Recommendations 90-1, 92-7, and 93-3) on this issue, the problem has not been successfully resolved.

The Board also has addressed the retention of critical technical expertise at the weapons laboratories where employees were already technically well-qualified. The Board has drawn attention to the safety implications of the loss of unique talents from DOE and its contractors caused by the down-sizing of the defense nuclear complex. This problem, which is addressed by Recommendation 93-6, is particularly acute for the assembly,

[1] Prior to 1995, DOE had authority for 200 excepted service positions. Congressional action in 1995 increased that number to 400.

disassembly, and testing of weapons, where budget pressures and other constraints are leading to severe erosion of the talent pools on which much of the weapons program has depended. The need for retention of technical expertise also extends to maintaining the capabilities to conduct criticality experiments necessary to provide a good base of information for criticality control. This is the subject of Recommendation 93-2.

4. Review DOE Safety Management, Oversight, and Enforcement Programs

CONGRESSIONAL MANDATE: Recognizing the paramount importance of DOE's own safety programs, Congress required the Board to oversee, monitor, and assist DOE's internal management and oversight of safety at defense nuclear facilities.

Defense nuclear facilities are maintained and operated by contractors under the direction, guidance, and oversight of federal employees of the DOE. The Board and DOE have often recounted the principle that line management bears the primary responsibility for safe operation of defense nuclear facilities. No amount of oversight, whether internal or external, can compensate for a line management which is neither dedicated to safety nor competent to achieve it. The Department must accelerate improvement in the effectiveness and competence of line management within DOE and contractor organizations, irrespective of whether oversight is accomplished internally, by external oversight similar to the Board's, or by an outside regulator.

The Department initiated a reorganization in 1992 which led to the consolidation of oversight and enforcement of nuclear safety functions within the Office of Environment, Health and Safety (EH). The Department recognized the necessity of placing oversight of DOE field offices and contractors in the hands of DOE employees outside of line management. In the Board's view, it remains an open question whether strong, independent safety oversight and enforcement programs will emerge from the reorganization. The new structure for oversight in EH is workable provided that (1) the new Office of Oversight is adequately staffed with technically qualified personnel, (2) its independence is maintained, and (3) its findings receive full attention by line management. The independence and capability of the enforcement unit within EH remain to be demonstrated.

5. Review Design and Construction of New Defense Nuclear Facilities to Ensure Public Health and Safety Are Adequately Protected

CONGRESSIONAL MANDATE: Congress requires the Board to review the design of new DOE defense nuclear facilities before construction and to recommend such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety. 42 U.S.C. § 2286a(a)(4).

Under the Atomic Energy Act, defense nuclear facilities include any equipment, device, or component, essential to the production or utilization of special nuclear material. Thus, the Board's mandate for design review extends from complete facilities, in the normally-accepted sense, to individual parts of those facilities.

As detailed in the Board's previous annual reports to Congress, this provision has worked as Congress intended. The fourth annual report to Congress discussed in detail the Board's systems engineering approach to facility design. In summary, the Board recognizes that design, construction, operation, and decommissioning of a facility constitute a complete life cycle system, and facilities must be developed with this entire history in mind. Any action related to one part of a facility during a discrete period of its life cycle must consider effects on the entire facility over all portions of the life cycle. The Board applies this approach to system safety reviews of existing (already-designed facilities) as well as to designs of new facilities or modifications of existing facilities.

Furthermore, DOE and its predecessor agencies have more often than not used a number of facilities at a particular site or at several sites in successive stages of a single project. This has led to facilities important for a single future mission of DOE being distributed among the complex of DOE's laboratories and production sites. Therefore, the use of a systems engineering methodology in solving DOE's ongoing problems requires addressing a system extending across one or more sites. Considerations of this sort affect construction and operation of single facilities that are only destined to be part of a larger enterprise.

For existing facilities, the Board reviews and analyzes the adequacy of the radiological safety design basis. For new facilities, the Board analyzes the design as early in the design and construction process as possible. Sixteen design and construction reviews are being conducted at ten defense nuclear sites. Eleven others are complete and four additional reviews are being planned.

The Board believes that its existing statutory authority for review of design and construction is sufficient to satisfy Congressional objectives for this component of the Board's oversight function. DOE has been cooperative and responsive to review findings. For example, at Savannah River Site, systems were reclassified to safety-related at the Defense Waste Processing Facility, tritium inventory limits were adopted at the Replacement Tritium Facility, and power limits were adopted at the K-reactor pursuant to Board Recommendation 91-5.

6. Determine That DOE's Response to Board Recommendations Adequately Protects Public Health and Safety Before Restart of Plutonium Operations at Rocky Flats

CONGRESSIONAL MANDATE: In 1992 the Senate Armed Services Committee expressed concern with the safe restart of plutonium buildings at the Rocky Flats Environmental Technology Site (Rocky Flats) in the National Defense Authorization Act for Fiscal Years 1992 and 1993. Section 3133 of that Act requires the Secretary of Energy to respond to the Board's recommendations numbered 90-2, 90-5 and 91-1 to the Board's satisfaction before plutonium operations are restarted in buildings at Rocky Flats.

The Board's implementation of this provision has operated as Congress expected it would. On a building-by-building basis, DOE was required to demonstrate to the Board that defense nuclear facilities at Rocky Flats were ready to operate safely. The process helped bring satisfactory safety results in the restart of Buildings 559 and 707.

7. Restore Public Confidence in Safe Operations of DOE Defense Nuclear Facilities

LEGISLATIVE HISTORY: The report of the Senate Armed Services Committee stated that, above all, the Board must have a primary mission to identify the nature and consequences of any significant threats to public health and safety, to elevate such issues to the highest levels of authority, and to inform the public. S. Rep. No. 232, 100th Cong., 1st Sess. 20-21 (1987).

Almost without exception, members of the public who have commented on the quality of the Board's technical work to upgrade safety at defense nuclear facilities have been complimentary of it. However, despite extensive action on the part of the Board and its staff to inform the public, the hearings conducted during 1994 in preparation for the fifth annual report revealed continued dissatisfaction on the part of some individuals and organizations with what is perceived as lack of access to Board decisionmaking processes. To put this criticism in perspective, the Board's statutory mandates regarding public access must be understood.

The Board's enabling statute prescribes how and when the Board is to notify the public of its actions and directs the Board to solicit public comments, data, views, or arguments and technical data. Where the Board, as a result of its deliberations, determines that action is necessary, section 312 of its enabling statute requires the Board "to make such recommendations to the Secretary of Energy with respect to Department of Energy defense nuclear facilities . . . as the Board determines are necessary to ensure adequate protection of public health and safety." Section 315 of the Board's enabling statute specifically prescribes the process by which the public is to be informed and to

comment on the recommendation process. The Board's enabling legislation provides for public availability and comment of Board recommendations "after receipt by the Secretary of Energy" or the President in appropriate cases. 42 U.S.C. §§ 2286d(a) and g(3). On July 24, 1992, the D.C. Circuit Court of Appeals upheld the Board's rules implementing the Government in Sunshine Act. The Court determined that any Board deliberations on potential recommendations for the President or the Secretary of Energy regarding health and safety issues at DOE's defense nuclear facilities must be conducted in closed meetings pursuant to the Board's rules under the Sunshine Act. Natural Resources Defense Council v. Defense Nuclear Facilities Safety Board, 969 F.2d 1248 (D.C. Cir. 1992), cert. denied, 113 S. Ct. 2332 (1993).

In its Annual Reports to Congress during the past five years, the Board has highlighted its actions to inform members of the public and to incorporate their views in the process of oversight over the health and safety of defense nuclear facilities. The Board has carefully adhered to requirements for publication of recommendations and the Secretary's responses, and for receiving comments during development of its recommendations. The Board publishes the full text of its recommendations in the Federal Register and distributes all recommendations to its own public reading room (established in 1991) and the DOE regional public reading rooms. Each Federal Register notice solicits public comments, and the Board carefully considers all comments received. Concurrently, the Board provides personal notice by direct mail to a lengthy list of individuals and organizations and to others when requested. Congressional representatives and committees, federal and state officials and committees, public interest organizations and members of the public receive such notice.

In addition to comments, the Board receives and responds to numerous requests for information, some pursuant to the Freedom of Information Act, and the rest as direct inquiries. The Board has been complimented for its timely and complete responses, and no Board response to a FOIA request or a request for public documents has been judicially challenged.

The Board has held a total of 38 public meetings or hearings in Washington, D.C., or in communities near defense nuclear facilities. These meetings provide opportunities for interested groups or persons, public and private, to express their views as to DOE facilities, directly to the Board members in informal and in open discussions near the sites.

In 1994 the Board conducted nine public hearings for the sole purpose of receiving the views of interested persons regarding (1) the Board's effectiveness in meeting its objectives, (2) recommendations to continue, modify or terminate the Board's functions, and (3) recommendations on implementing modifications. All but one of these hearings were held near DOE defense nuclear facilities. The remaining hearing, at the Board's

offices in Washington, D.C., was for the purpose of receiving testimony from the Secretary of Energy and Senior officials of the DOE on these topics. Comments were received, either orally or in writing, from eighty-four individuals or groups related to the local hearings at DOE's sites, and have been incorporated into this report.

D. RECOMMENDATIONS FOR APPROPRIATE TRANSITION REQUIREMENTS IN THE EVENT THAT MODIFICATIONS ARE RECOMMENDED

The Board makes no recommendations for statutory authority changes to its function or organization. Thus, no transition requirements are needed.

E. RECOMMENDATIONS FOR CONTINUATION, TERMINATION, OR MODIFICATION OF THE BOARD'S FUNCTIONS AND PROGRAMS

1. Continuation of External Oversight Function

The Board believes the continuation of external oversight of the nuclear safety management of defense nuclear facilities is advisable. In addition, the Board's public hearing records show that the DOE, state and local governments, and the public believe the external oversight function entrusted to the Board has proved to be beneficial and merits continuance. The Secretary of Energy so testified at the Board's public hearing held on December 6, 1994.

While progress has been made by the DOE in restructuring and implementing an internal safety management program, the need for external vigilance continues to exist to ensuring public health and safety. This need will remain so long as defense nuclear facilities continue to store, process or use radioactive materials. Aging of the nuclear weapons complex and mission changes, such as the transition of numerous facilities from operations to decontamination, decommissioning, and cleanup, complicate the safety environment and present new hazards. Although DOE has acted to develop and implement independent internal safety oversight, effectiveness has yet to be demonstrated. Such efforts, while necessary for any acceptable nuclear safety management program, are not sufficient.

It is a widely-held principle that those who use radioactive material must bear prime responsibility for assuring no undue risks to workers, the public, and the environment. It is equally common practice, both nationally and internationally, to provide external oversight of safety management programs. It was concern about DOE's self-managed safety program, and the lack of independent internal oversight, that led Congress to establish the Board in the first place.

All facts considered, the Board believes it is highly advisable to continue as an independent external oversight agency as originally envisioned and authorized by Congress. Further, the Board advocates such continuance regardless of which agency of government, DOE or otherwise, administers the program for stockpile management or stewardship of the nation's nuclear weapons complex and the decommissioning of facilities no longer needed for national security.

2. Enhancing the Board's Effectiveness Under Current Statute

The Board's statutory authority centers on making recommendations to the Secretary of Energy. The Board has experienced a number of problems with the recommendation process, particularly with achieving full and timely implementation of recommendations by DOE and informing the public as to the safety issues on the Board's agenda. The Board evaluated its experience with the recommendation process with increased effectiveness as the objective. The Board considered (1) ways for achieving more timely DOE responses using authority of the existing statute and (2) potential benefits from statutory changes.

a. Current Statutory Authority

The Board identified a number of means for exercising its current statutory authority more effectively. These include the following.

- Focus and maintain the attention of DOE top officials on correcting safety problems. Early and sustained involvement by high-level DOE officials responsible and accountable for progress enhances timely and effective responses to recommendations.

- Conduct hearings, and where appropriate, public hearings, to effectively elevate issues, focus attention, and increase accountability.

- Increase prompt dissemination of safety information to the public through increased use of public hearings.

- Provide additional on-site representatives, who will be instructed to interact with members of the public locally on a regular basis.

- Continue and extend avenues for disseminating information electronically to the public.

b. Statutory Changes Considered

Potential changes the Board considered and its conclusions are as follows.

- Shortening the period for DOE to develop implementation plans once a recommendation is accepted. (DOE regularly takes about 225 days to issue an implementation plan rather than the statutorily mandated 135 days.)

The problem with shortening the time period is that it does not provide sufficient time for DOE to develop implementation plans adequate to attack complex safety problems. Engaging and working directly with upper level management at DOE, however, is necessary in achieving acceptable Implementation Plans, and it can speed the process.

- Require Board approval for startup or restart and granting stop work authority based on safety considerations, independent of the recommendation process.

Startup and restart approval based on a Board review of the facility and its administrative programs would be similar in effect to licensing. In the past five years, however, DOE has shown no inclination to operate a facility in an unsafe manner once the Board had pointed out problems. The Board is satisfied that, should a situation arise where startup or continued operation of a facility might be contemplated by DOE despite serious safety problems, or result in imminent or severe risk, a recommendation to the Secretary or to the President would result in prompt action.

- Board concurrence with, or establishment of safety standards.

DOE is in the best position to develop its own rules. To assume this responsibility, the Board would need to take over considerable management structure which is resident within headquarters and the field offices of DOE, along with some control over DOE contractors and national laboratories. The Board concludes that standard-setting or approval powers are not needed at present because the Board has been able, through the recommendation process, to spur DOE to develop or revise safety standards where necessary. The Board believes that timeliness of issuance of Orders and standards can be addressed through increased involvement of DOE's upper management in the process.

- Incorporation of DOE implementation plan commitments to the Board into DOE's contracts for operation of DOE facilities.

With few exceptions, the mandates in the Board's enabling statute are directed toward DOE, not its contractors. The contractors, however, are instrumental in the development of implementation plans and are vital to the completion of those plans. The Board's review of existing contracts and requests for proposal often reveals that actions

related to implementation of the Board's recommendations and DOE's safety Orders are not contractual requirements. Because the Board has only recently brought this issue to the attention to DOE management, statutory amendment is unnecessary at this time. There are also numerous legal and practical impediments to implementing such a course of action.

- Board authority to compel DOE and contractor action to implement Board recommendations.

A statutory change could authorize the Board to issue compliance orders and to take enforcement actions against DOE and its contractors when commitments made in implementation plans addressing Board recommendations are not fulfilled. Compliance orders are an appropriate tool--used by many Federal regulatory agencies--to mandate specific corrective actions, suspend certain activities, or carry out programmatic commitments. Board orders directed to DOE, if authorized by statute, would not give rise to procedural complexities such as the need to meet Administrative Procedure Act hearing requirements. Board orders to contractors would need to be accompanied, for due process reasons, by the offer of an administrative hearing to the contractor if factual or other matters are in dispute. This would in effect make the Board a quasi-regulatory agency, which Congress, in establishing the Board, rejected. This option also might create an incentive for DOE to submit weak, non-specific implementation plans incorporating lengthy schedules inconsistent with the urgency of safety problems.

3. The Need for Formal Regulatory or Licensing Authority

During the past year, there has been much discussion of the extent to which DOE is self-regulating. "Self-regulating" means the extent to which the Department's programs and actions, operating under the constraints of the Atomic Energy Act, are not constrained by other Federal and State laws. The premise that today DOE is self-regulating is inaccurate. It is a carryover from the early days of the Manhattan Project and the Atomic Energy Commission (AEC). Defense nuclear activities were exempt from licensing under the Atomic Energy Act and, with some exceptions, remain so today. However, exemption from licensing is not synonymous with exemption from external oversight. In fact, DOE is subject today to very substantial external regulation and oversight. This results not only from Board oversight of nuclear safety, but also from the Environmental Protection Agency (EPA) (RCRA, CERCLA, the Atomic Energy Act, the Low Level Radioactive Waste Policy Act, the Clean Air, Clean Water, and Federal Compliance Agreement Acts) and to a more limited extent the Nuclear Regulatory Commission (NRC) (Nuclear Waste Policy Act, 1982). The most notable current exception to external oversight is in the Occupational Safety and Health Administration (OSHA) area. The extent of existing regulation is graphically displayed in Figure 1.

In the areas within the Board's jurisdiction, the recommendation process has resulted in significant progress in improving DOE's internal safety programs. The Board expects a greater rate of improvement, and anticipates that more aggressive use of its existing powers will compel that progress. Shifting to a regulatory format at this point would not only be costly, but could also be counterproductive. Regulations which are appropriate to the defense nuclear complex would be needed and an independent compliance and enforcement program would have to be structured.

The Board's current oversight responsibilities and its position regarding the need for formal regulation or licensing of DOE defense nuclear facilities is displayed in Figure 2, which divides the defense nuclear complex into four parts. Part I of Figure 2 displays the traditional facilities and functions of the defense nuclear complex--weapons assembly, disassembly, and testing; weapons design at national laboratories; and other production facilities. The legislative history pertaining to the establishment of the Board clearly indicates Congressional interest in continuing to exempt defense nuclear facilities from licensing. Licensing provides the possibility and authority for a licensing agency to deny permission to construct or operate. Obviously, Congress chose to reserve decisions affecting national defense and security for the President and Congress. Congress did, however, believe there was a need to subject public health and safety of DOE's defense nuclear facilities to formal external oversight. This oversight includes the design, construction, operation, and decommissioning of defense nuclear facilities. At a minimum, in the Board's view, those facilities of the defense nuclear complex deemed necessary for defense and security should continue to be constructed and operated subject to oversight of the Board, but without the encumbrances of a formal licensing process.

Part II of Figure 2 displays facilities and functions related to the decontamination and decommissioning of facilities no longer needed for production, and those necessary for the treatment, storage, and handling of nuclear waste. The rationale for exempting facilities no longer needed for national security purposes is somewhat different from the case made for continuing to exempt defense nuclear facilities required for national security and defense from licensing.

The Board is currently authorized to provide external oversight of defense nuclear facilities and activities from design through decommissioning. The Board's oversight duties appear to overlap with EPA's responsibilities when certain facilities are combined with associated contaminated land areas to define "operable units" for cleanup under CERCLA provisions. EPA and the states are also involved in new facilities being constructed or operated to treat, stabilize, and safely store radioactive waste and residuals of the production of special nuclear materials.

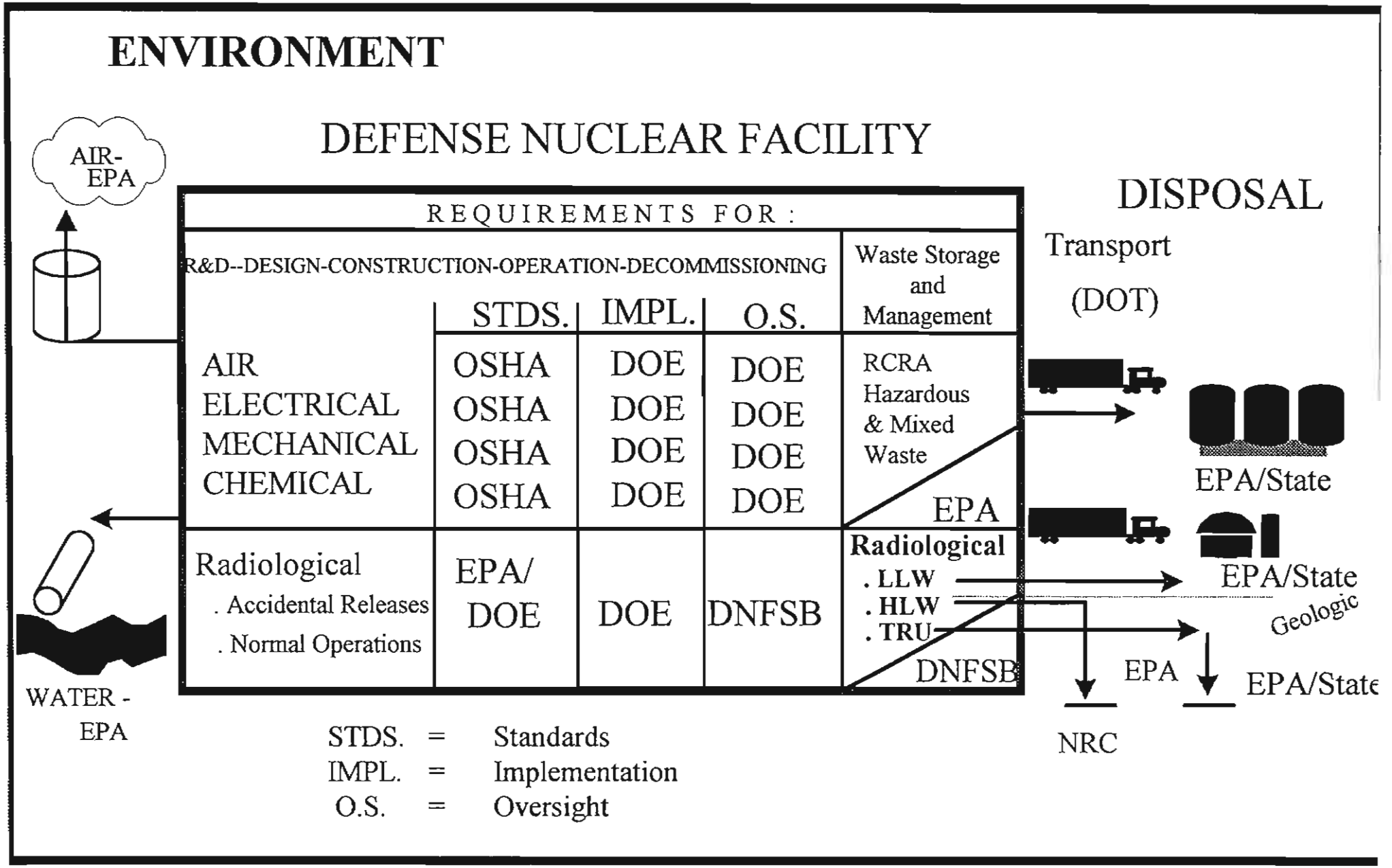

FIGURE 1

DUE TO THE COMPLEXITY OF THE ISSUES SUMMARIZED IN THIS FIGURE, IT MUST BE READ IN CONJUNCTION WITH THE FULL TEXT IN PART II, SECTION IV.D.1.

DOE Defense Nuclear Complex

FACILITIES	LABORATORIES WEAPONS ASSEMBLY & DISASSEMBLY TESTING SURVEILLANCE & READINESS SPECIAL NUCLEAR MATERIALS	SPENT FUEL & PRODUCTION RESIDUALS EXCESS SPECIAL NUCLEAR MATERIAL	TREATMENT & STABILIZATION FACILITIES WASTE PROCESSING & STORAGE RADIOACTIVE WASTE	EXCESS FACILITIES . CUSTODIAL . DECONTAMINATION (D) ——————— . DECONTAMINATION & DECOMMISSION (D&D) . (D&D PLUS ENV. RES.)	OPERABLE UNITS RCRA & CERCLA . (D&D PLUS ENV. RES.)	REPOSITORIES . HL-W . LL-W . MIXED . TRU
FUNCTIONS	STEWARDSHIP/NATIONAL SECURITY & DEFENSE		TREATMENT & STABILIZATION ——————— SAFE STORAGE	CUSTODIAL & D&D	ENVIRON-MENTAL RESTORATION	WASTE DISPOSAL
	PART I		PART II		PART III	PART IV

FIGURE 2

There appears to be the perception in some circles that a different form of external regulation of these activities, such as NRC licensing, would enhance public acceptability of DOE actions. The more fundamental considerations should be whether the cost of alternative external oversight and regulations would be worth the benefits. Given the extensive external regulation and oversight already accorded facilities that fall under Part II, it makes little sense to add yet another agency to those that DOE must deal with for these facilities.

Ideally, one agency should retain the lead for external oversight or regulation of these nuclear facilities from start to finish; that is, from design through final disposition. The object should be to maximize safety and minimize the cost of oversight and regulation, not complicate DOE's compliance efforts by fragmentation of requirements imposed by multiple agencies.

Facilities and activities that are being remediated pursuant to environmental restoration laws are displayed in Part III. Remedial actions come under the purview of the CERCLA, as administered by EPA, and states. In some cases, DOE will also have made commitments to the Board regarding public health and safety aspects relevant to remedial actions at defense nuclear facilities. The Board in such cases can and should assist EPA by insuring that such commitments are duly considered prior to completion of the remedial action plan. In effect, the Board should strive to assure an ordered transition of the oversight function.

Part IV of Figure 2 clearly illustrates that final repositories for nuclear waste are governed by existing statutes and regulations. Thus, there is no need for additional regulatory authority.

Currently, the Board monitors DOE compliance with facility design, construction, and operational safety standards, and has issued recommendations related to facility startup where necessary. DOE has shown no inclination to operate a facility in the face of a Board recommendation to the contrary. Thus, the current process provides much of the safety benefit of licensing without the associated cost and delay, and it avoids the potential for airing security matters in hearings that would accompany formal licensing proceedings. The Board does not, therefore, recommend formal licensing.

It has been suggested by some that formal regulatory authority might enable a regulatory agency (1) to break the logjam often encountered in having DOE correct safety problems at existing facilities and (2) to create a framework of safety requirements tailored to the defense nuclear complex, much as the NRC has done for the commercial nuclear industry. However, regulation in this case, with or without licensing authority, would introduce drawbacks that would more than offset any advantages. Full regulation of defense nuclear facilities is not easily reconciled with national security imperatives.

Concessions must be made to national defense priorities over which a regulator would have no control and no authority or capability to set. Also, transition of the Board from an oversight and recommendation-oriented agency to a regulatory and licensing agency would be very expensive. The Board does not believe that this added cost would be accompanied by a commensurate added safety benefit.

PART 2

5TH YEAR REPORT
ASSESSMENTS AND RECOMMENDATIONS

II. SETTING THE STAGE: PAST AND PRESENT SAFETY PROGRAMS FOR DOE DEFENSE NUCLEAR FACILITIES

A. OVERVIEW OF DOE'S AND PREDECESSOR ORGANIZATIONS' NUCLEAR SAFETY AND OVERSIGHT PROGRAMS

The Department of Energy (DOE) traces its roots to the U.S. Army Corps of Engineers Manhattan Engineering District, which was established in 1942 to develop the atomic bomb. In the Atomic Energy Act (AEA) of 1946, Congress closed the Manhattan project and created a civilian agency, the Atomic Energy Commission (AEC), to manage nuclear weapons matters. The AEC was later given responsibility for developing nuclear reactors for naval propulsion and electric power generation; and producing nuclear materials for civilian applications. After the 1954 amendments, the AEC also regulated the nascent civilian nuclear power industry, combining in one agency the functions of today's DOE and Nuclear Regulatory Commission (NRC).

The Atomic Energy Act has always coupled two major purposes with respect to the military and civilian uses of nuclear materials: protecting the public health and safety, and providing for the common defense and security of the United States. These dual purposes are repeated throughout Sections 2 and 3 of the 1954 Act. 42 U.S.C. §§ 2011 and 2012. These purposes are unchanged today. Section 161 of the Act instructed the Atomic Energy Commission to "establish . . . such standards and instructions to govern the possession and use of special nuclear material, source material, and byproduct material as the Commission may deem necessary or desirable to promote the common defense and security or to protect health or to minimize danger to life or property . . . ." 42 U.S.C. § 2201(b). This mandate to establish standards applies today to both the Nuclear Regulatory Commission and the Department of Energy (DOE).

Pursuant to the Energy Reorganization Act of 1974, the AEC's responsibilities for commercial nuclear power were split: development functions were given to the Energy Research and Development Administration (ERDA), while regulatory authority was given to the Nuclear Regulatory Commission (NRC). The AEC's nuclear weapons activities, on the other hand, were given undivided to ERDA. In 1977, Congress combined the functions of ERDA with the Federal Energy Administration, the Federal Power Commission, and units of several other agencies into a new cabinet-level department, the DOE. DOE's authority to impose safety requirements is elaborated upon in the Department of Energy Organization Act of 1977, 42 U.S.C. § 7101 et seq., in section 7191. Thus, DOE inherited the responsibility both to manage the production of nuclear weapons and to assure the nuclear safety of production activities.

As successor to the AEC and ERDA for defense nuclear activities, DOE maintains statutory authority to establish, oversee, and enforce compliance with nuclear safety requirements. It is often stated that the Department is "self regulating" for health and

safety matters at defense nuclear facilities. The statement is fundamentally accurate only with regard to nuclear safety per se at such facilities; moreover, the imposition of environmental statutes and regulations administered by the Environmental Protection Agency (EPA) and the addition of the Board as an external oversight organization altered DOE's "self-regulating" status. Part 2, Section IV.D.1. of this report analyzes the role of numerous federal and state regulators of DOE nuclear operations.

Prior to the Price-Anderson Act Amendments of 1988, the principal tools available to DOE for achieving nuclear safety were DOE safety orders, which could be made mandatory and enforceable via management and operating (M&O) contract terms. DOE also possessed the authority to issue and enforce legally binding regulations, after public notice and comment, and to issue administrative orders of compliance with safety requirements under the AEA and the Administrative Procedure Act. In recent history (the past decade, at least), DOE has not effectively invoked any of these processes and legal mandates to enforce compliance with existing health and safety standards. It is the failure of DOE to enforce its legal authority that spurred Congressional efforts in the late 1980's to restructure and improve oversight and enforcement of standards at DOE defense nuclear facilities.

Civil penalties may be levied for violations of nuclear safety regulations and orders. DOE issued the final procedural rule containing the Department's enforcement policy and penalty procedures in August 1993, and continued the transition of requirements in Orders to rules. DOE's progress on issuing substantive nuclear safety rules has been slow.

Despite its long-standing responsibility for health and safety matters and authority to enforce safety standards, DOE's paramount concern long remained production of nuclear materials and weapons. This production was accomplished by using facilities and practices that were tied to pre-1970 design and safety principles. Many present-day observers, in retrospect, believe the Department paid inadequate attention to such issues as environmental protection, the health and safety of workers and the public, and openness and responsiveness to the concerns of interest groups and the public.

B. HEALTH AND SAFETY PROBLEMS LEADING TO THE CREATION OF THE DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Although its five members were not appointed until October 19, 1989, the Board was established in 1988 as a result of the confluence of Congress's specific health and safety concerns with the broader policy issues discussed above. Previously in 1985, Senator John Glenn, acting through the Senate Governmental Affairs Subcommittee on Energy, Nuclear Proliferation, and Government Processes, launched an investigation of health and safety problems at the Feed Materials Production Center in Fernald, Ohio. Subsequently, Senator Glenn asked the General Accounting Office (GAO) to review

health and safety issues at a number of DOE facilities around the country. The GAO report was issued in 1986 and documented serious safety issues at nearly all of the plants visited.

In mid-1987, as the extent of damage due to the April 1986 Chernobyl nuclear reactor accident became known, Congressional committees with jurisdiction over DOE facilities, such as the Senate Armed Services Committee (chaired by Senator Sam Nunn) and the Senate Governmental Affairs Committee (chaired by Senator John Glenn) focused further attention on the environmental, health, and safety conditions in the nuclear weapons complex. A previously commissioned study by National Research Council of the National Academy of Sciences was also published in 1987. The study was highly critical of safety conditions at DOE defense nuclear facilities. Among the study's conclusions and recommendations were the following. National Research Council, Safety Issues at the Defense Production Reactors, at xiv-xviii (1987).

- DOE "has not realistically addressed the aging of the defense production reactors."

- The "existing level of understanding of severe accident behavior for the production reactors is inadequate . . . ."

- A "thorough understanding of the behavior of the N-Reactor in a major loss-of-coolant accident does not currently exist . . . ."

- There are "significant uncertainties in the ability of the existing production reactor confinements to mitigate the effects of radionuclide releases that would be expected to occur during severe accidents."

- DOE's "direct discharge of radioactively-contaminated liquid effluents [at Hanford and Savannah River] . . . poses a safety hazard and represents an environmentally unsound practice."

- DOE, "both at headquarters and in its field organizations, has relied almost entirely on its contractors to identify safety concerns and to recommend appropriate actions, in part because the imbalance in technical capabilities and experience between the contractors and DOE staff is of sufficient magnitude to preclude DOE from properly performing its audit function."

- DOE's "approach to management falls short of reasonable expectations in attempting to cope with the mix of production and safety responsibilities."

- DOE's "safety oversight of the production reactors is ingrown and largely outside the scrutiny of the public. Weaknesses in management of the defense production

reactors have led to a loose-knit system of largely self-regulated contractors operating within budgetary constraints imposed by and on the Department."

Many of these conclusions and recommendations reiterated those of the earlier 1981 report of the "Crawford Committee," and would appear again in 1988 and 1989 reports of the National Research Council. Indeed, the 1989 report, which was in preparation at the time of the Board's establishment, raised safety concerns that went far beyond nuclear safety at DOE's reactor facilities. National Research Council, The Nuclear Weapons Complex: Management for Health, Safety, and the Environment, at 4-7 (1989).

- "Virtually every facility in the complex has contamination on site, some of it extensive, and many of them have contamination off site as well."

- "[T]here are troublesome elements in the fire protection program."

- "[A] pattern of routine use of respirators [to prevent the inhalation of radioactive materials] is an indication of the failure of production, maintenance, and housekeeping procedures."

- "Plutonium exists in the exhaust ducts downstream of the high-efficiency particulate air (HEPA) filters at the plutonium finishing facility at Hanford . . . [and] in an exhaust duct of Building 771 at Rocky Flats."

- "[T]here are weaknesses in the program for controlling . . . conventional industrial hazards."

- "In short, the medical departments are for the most part relegated to a reactive role. . . . Medical monitoring and surveillance programs in the complex should be improved substantially."

- "Much of the physical plant of the weapons complex is old, and many of the processes used in production are outdated."

Additionally, numerous General Accounting Office (GAO) reports raised serious questions about both the safety of individual facilities and DOE operations as a whole. Senator Glenn introduced legislation in April 1987 to bring DOE's defense nuclear facilities under strict external regulation. The Reagan administration and the Senate Armed Services Committee opposed the most stringent provisions (allowing fines and penalties against DOE) in the draft legislation. The proposed legislation made little headway in Congress for more than a year.

The Advisory Committee on Nuclear Facility Safety (ACNFS) was an internal DOE group appointed by the Secretary in 1987. This committee was known as the

Ahearne Committee, after its Chairman, Dr. John F. Ahearne, a former Chairman of the U.S. Nuclear Regulatory Commission. The ACNFS comprised 15 highly-respected scientists and researchers, all of whom were well-known experts in nuclear safety. The reviews initiated by the Ahearne Committee covered the following issues among others:

- deficiencies in the waste storage program for high-level waste at the Hanford Tank Farms, particularly the lack of a coherent characterization strategy to provide the bases for later decisions regarding ultimate disposal;

- problems associated with accumulated plutonium at Rocky Flats, and with restart criteria for various buildings (then) proposed to be placed back in operation; and

- Department-wide issues associated with inclusion of on-site, neighboring workers as a group requiring consideration in safety analyses, staff training and qualification, and adequacy of the overall DOE radiological protection program.

On September 28, 1988, the House Armed Services Subcommittee on Procurement and Military Nuclear Systems began public hearings on the restart of a nuclear reactor at the DOE's Savannah River Plant near Aiken, South Carolina. The reactor had been shut down in August 1988 due to an operating mishap. At the hearings, a DOE official stated that, although a start-up attempt had been aborted in August due to a rapid temperature and pressure build-up, "we must restart the reactor" to meet national security needs. Two days later, at a joint House-Senate hearing on the same issue, chaired by Representative Mike Synar and Senator John Glenn, a Congressional press release provided public details of thirty serious safety incidents at the Savannah River reactors.

In 1988 the Senate Armed Services Committee resumed consideration of a new version of Senator Glenn's 1987 proposals. In September 1988, the Armed Services Committee adopted a modification of Title I only of the Government Affairs Committee bill (S. 1085), and the Defense Nuclear Facilities Safety Board was established in the National Defense Authorization Act for Fiscal Year 1989 (Pub. L. 100-456). The Board's principal means of effecting change at defense nuclear facilities was to be issuance of recommendations on health and safety to the Secretary of Energy, or in certain pressing circumstances, directly to the President. The law was praised by Senator Glenn as "a major and positive departure from past practices which have led to this crisis now affecting the U.S. nuclear weapons complex."

C. PROBLEMS ADDRESSED BY THE BOARD DURING ITS FIRST FIVE YEARS OF OPERATION

As would be expected, many of the nuclear safety and health issues which led to creation of the Board became the major focus for the Board's activities during the first five years of its operations. During the period before the ACNFS was dissolved by the

Secretary of Energy, the staffs of the Committee and the Board maintained close contact to ensure that relevant information on safety matters was exchanged promptly and completely, and that both the Board and the Committee were kept fully informed of the ongoing activities of one another. The Board surveyed the record of ACNFS activities on an ongoing basis and continued to follow important issues identified by the ACNFS that remained unresolved at the time the Committee was dissolved. The deliberations of the Ahearne Committee proved to be a valuable technical resource for the Board and its staff.

Several of the Board's earliest recommendations and public hearings addressed the safe restart of the K-Reactor at the Savannah River Site in the wake of Congressional hearings and the National Research Council's report. The Board also quickly focused on the problems posed by the nuclear waste storage tanks at the Hanford Site, resumption of selected plutonium operations at Rocky Flats, and the operational readiness of the Waste Isolation Pilot Plant (WIPP).

Subsequently, the Board broadened its attention to include the development of, and compliance with, nuclear safety standards, including DOE Orders, rules and other requirements (Recommendations 90-2, 91-1, 93-1); the need for DOE to recruit, train and educate sufficient numbers of technically qualified personnel for defense nuclear operations (Recommendations 90-1, 91-1, 91-6, 92-7, 93-3, 93-6); use of requirements-based operational readiness reviews (Recommendations 90-4, 91-3, 91-4, 92-1, 92-3, 92-5, 92-6); safe management and storage of nuclear residue and waste (Recommendations 90-3, 90-7, 92-4, 93-4, 93-5, 94-1, 94-2); and use of systems engineering techniques and integrated engineering program plans at defense nuclear facilities (Recommendations 92-4, 93-5, 94-1, 94-3). These recommendations and associated Board activities are explained in the Board's five annual reports to Congress, including this report, to provide Congress with a clear picture of the safety progress which has been made and the work that remains.

Three pillars upon which nuclear safety is based -- the quality and competence of nuclear managers, workers, and oversight personnel in the defense nuclear complex; disciplined operation of nuclear facilities in conformance with nuclear safety standards, including requirements in orders, rules, and other safety documents; and adequate organization and structuring of nuclear safety programs and oversight by committed managers -- were the subject of numerous Board recommendations, DOE reporting requirements, and hearings and discussions during the Board's first five years of operation.

D. CHANGES IN THE DEFENSE NUCLEAR COMPLEX AND THEIR IMPLICATIONS FOR SAFETY AND HEALTH AND BOARD JURISDICTION

Congress initially gave the Board jurisdiction over DOE "defense nuclear facilities" defined by statute as production or utilization facilities, themselves defined in 42 U.S.C. § 2014, "operated for national security purposes" and nuclear waste storage facilities under the control or jurisdiction of the Department of Energy. 42 U.S.C. § 2286g. There are numerous defense nuclear facilities at any major DOE site such as the Pantex Plant or Savannah River Site. Congress' initial grant of jurisdiction to the Board was examined in detail by the Board in Part II of its first annual report to Congress.

The collapse of the Soviet Union brought an end to the Cold War, at least as it was known from the 1950s to 1990. With the collapse came the creation of new nations with nuclear weapons capabilities, as well as different threats to non-proliferation and international peace.

As a matter of national policy, United States nuclear weapons production has stopped and disassembly of a large fraction of the nuclear weapons stockpile has begun. DOE has closed sites for production of weapons components and has consolidated operations required for stockpile maintenance at fewer locations. The United States has imposed a moratorium on nuclear weapons testing. The federal government must now maintain a safe and reduced nuclear weapons arsenal and provide the required secure and safe storage of nuclear components and special nuclear materials removed from the stockpile. Thus, the Office of Defense Program's (DP) mission within DOE has shifted from one of production of nuclear weapons materials to one of stewardship, storage, and maintenance of nuclear weapons and nuclear materials and the disassembly of thousands of existing weapons.

In the meantime, DOE must safely manage large amounts of radioactive, hazardous, and mixed wastes which have accumulated at the many weapons production sites over the years. Many former production facilities that were shut down contain radioactive materials in process lines, tanks, storage vaults, and storage pools. Safe standby or shutdown conditions must be maintained until the facilities are readied for clean out of the radioactive residues and decommissioning. As both DOE and the Board have stated repeatedly in testimony to Congress, cessation of operations and movement toward decontamination, decommissioning, and environmental restoration bring new, and in many cases, greater threats to worker and public health and safety than when the complex was operated in a production mode. Accomplishing these tasks brings workers into close proximity to the hazardous materials and increases the potential for accidents and dispersal of radioactive materials.

A mammoth, multiple-site cleanup of previously contaminated sites is underway, requiring a substantially different set of technological solutions and technical resources than are needed for weapons design, construction, production, assembly, and disassembly. DOE, the Environmental Protection Agency, the Board, and other federal departments and agencies, together with their state counterparts and public interest groups, all play a role in this complex cleanup effort. Federal Court decisions and consent agreements by parties to litigation heighten the need for oversight and effective management of these cleanup efforts. In this setting, assurance of public and worker safety remains highly dependent upon recruitment and retention of a well-educated and trained workforce by both DOE and support contractors, and a disciplined conduct of operations governed by an adequate set of nuclear safety requirements.

The Board has conducted its oversight of the defense nuclear complex during a period when a change in Administrations also has taken place. Thus, while the transition in the defense nuclear complex has occurred, a change in safety management also has taken hold. Nuclear safety programs within the Office of Defense Programs, and oversight of those programs by the Office of Environment, Safety and Health, have been reorganized. Nevertheless, line responsibility for safety and independent internal DOE oversight remain the first and second levels of management "defense in depth" for nuclear safety in the defense complex.

In 1991, Congress made two significant adjustments in Board jurisdiction which reflect the change in the defense nuclear complex. The first adjustment was to expand jurisdiction to cover DOE's inspecting and dismantling of nuclear weapons to meet international treaties and domestic commitments. Congress included DOE's assembly and disassembly of nuclear weapons at the Pantex Plant near Amarillo, Texas, within the definition of defense nuclear facilities, together with facilities for testing nuclear weapons. The Board's statutory ceiling for full-time staff was increased by Congress from 100 full time equivalents (FTEs) to 150 FTEs to accomplish safety oversight of these facilities. 42 U.S.C. § 2286b(b)(1)(A). Second, recognizing the shift from production and the increase in the amount of decontamination and decommissioning work at DOE defense facilities, Congress urged the Board to expand its activities in the environmental area, consistent with the original authorization statute. S. Rep. No. 113, 102d Cong., 1st Sess. 379 (1991).

The Board now has health and safety oversight responsibilities for the following DOE programs.

- Disassembly and assembly of nuclear weapons at the Pantex Plant.

- DOE's stewardship of nuclear materials and weapons needed for the nation's nuclear stockpile.

- Operation of a downsized and reconfigured defense nuclear complex, including the appropriate portions of National Laboratories that are defense nuclear facilities.

- DOE's internal oversight of the reconfigured defense nuclear complex.

- Transition of defense nuclear facilities to decontamination, decommissioning, and restoration.

- Storage, stabilization, and management of nuclear waste and residue from and at defense nuclear sites throughout the complex.

Some of the most significant changes in the complex stem from the transition taking place at many facilities from production to decontamination, decommissioning, and environmental restoration. For five years, the Board has provided oversight of DOE nuclear waste storage facilities which are not licensed by NRC. The Board's enabling statute also directed the Board to review and evaluate the content and implementation of DOE standards related to decommissioning defense nuclear facilities. With DOE's emphasis on decontamination and decommissioning former nuclear production sites, the Board has itself increased its attention and expenditures on those issues. The Board provides oversight of those transition activities that are not currently regulated as waste management activities falling under the Resource Conservation and Recovery Act (RCRA) or Superfund. Those statutes, however, do not cover certain defense nuclear activities. The reason for the discontinuity in EPA regulatory authority stems from definitions of solid or hazardous waste and materials contained in RCRA and Superfund. While some special nuclear materials are subject to RCRA and Superfund requirements when mixed with other conventional hazardous waste or released to the environment, they are legally not subject to those two statutes when they are source, special nuclear, or byproduct material governed by the Atomic Energy Act or residues subject to recycling or reuse.

The Board recognizes that the transition from production and decommissioning to storage and eventual disposition of nuclear material will be a primary focus of Board activity in the future. Congress, in passing the legislation establishing the Board, acknowledged that the line separating safety and environmental issues is an unclear one. In separating environmental management and restoration from nuclear production and storage operations, a key Congressional Report on the matter stated the following:

> Given the existence of a comprehensive regulatory regime, it is not necessary to assign an environmental oversight role to a safety board. For one thing, the technical issues are quite different, requiring different--and additional--expertise within the Board. Second, it would needlessly dilute the focus and mission of the Board. Third, insofar as the Board's basic mission is to ensure that, in satisfying production requirements, the commitment to

> safety is not compromised, it is hard to discern a rationale for including environmental restoration in the Board's charter or for citing environmental problems in the justification for creating the Board in the first place.
>
> The distinction between safety and environmental issues, in the Committee's view, should be that safety includes unintended releases from ongoing production operations, which is a concept that would exclude normal waste management operations and remedial actions associated with existing waste storage sites. The Committee stresses that a safety board should not be prohibited outright from crossing that potentially elusive line; the Committee seeks only to clarify its intention that safety of production operations must be the Board's primary concern. S. Rep. No. 232, 100th Cong., 1st Sess. 19-20 (1987).

More recently, in the report of the Senate Armed Services Committee on S. 1507, the National Defense Authorization Act for Fiscal Years 1992 and 1993, the committee requested the Board to expand its activities, pursuant to existing statutory authority, over environmental restoration and waste management operations. The report stated that "[t]he Safety Board has been very involved with the Hanford waste tanks and other limited issues arising out of the Department of Energy environmental restoration and waste management, but the committee would like the Safety Board to take a more involved role in this area." S. Rep. No. 113, 102d Cong., 1st Sess. 379 (1991).

The Board has expanded its reviews and formal action within the bounds of its existing jurisdiction. The Board's objective is to assure that effective external oversight is continuously maintained during the transition of select DOE defense nuclear facilities from DOE "self-regulation" with Board oversight to EPA regulation under CERCLA. DOE commitments to the Board must be retained and implemented until the transition in oversight is completed. For example, the Board issued two recommendations in 1994 which bear directly upon stabilization and final disposition of radioactive waste and residues. Recommendation 94-1 called for prompt action at various sites to stabilize nuclear residues, and render them more safe, while the options for final disposition of liquid wastes and plutonium residues are considered by DOE. Recommendation 94-2 deals with DOE conformance to safety standards at low-level waste storage and disposal sites.

Discussions have been initiated with EPA and DOE regarding the Board's interest in DOE waste management and environmental restoration activities at defense nuclear facilities. The discussions have been focused on remedial action plans proposed by DOE for defense nuclear facilities with significant radiological source terms.

III. ASSESSMENT OF BOARD AND DOE EFFORTS TO MEET CONGRESSIONAL OBJECTIVES DURING FIRST FIVE YEARS OF BOARD OPERATION

By statutorily mandating the Board's principal functions in Section 312 of the enabling statute, 42 U.S.C. § 2286a, Congress told the Board and the Department of Energy how it believed the Executive Branch could achieve adequate protection of public health and safety at defense nuclear facilities. The Congressional purposes and goals in establishing the Board are further illuminated by (1) other provisions of the Board's enabling statute which give the Board tools for executing its principal duties; (2) the legislative history of the Board's enabling Act; (3) hearings conducted subsequent to the establishment of the Board, and (4) other supporting documentation. Determining how well the Board and DOE have achieved those objectives called for self-assessment and judgment. Because judgment is involved, the assessment of how well the Board and DOE have met Congressional objectives will remain, in part, a matter of subjective opinion about which reasonable minds can differ. The appropriate starting point of this analysis is an assessment of the effectiveness of the safety recommendation process itself.

A. ENSURING ADEQUATE PROTECTION OF PUBLIC HEALTH AND SAFETY AT DEFENSE NUCLEAR FACILITIES THROUGH EFFECTIVE USE OF BOARD RECOMMENDATIONS

CONGRESSIONAL OBJECTIVE: The Board is to assist DOE in improving safety at defense nuclear facilities by identifying potential public health and safety issues, recommending actions to the highest levels of the federal government to prevent or remediate threats to safety or actual damage, and monitoring the accomplishment of such corrective actions.

The heart of the Board's statutory responsibilities is to "make such recommendations to the Secretary of Energy [or in the case of imminent or severe risk, to the President] . . . as the Board determines are necessary to ensure adequate protection of public health and safety" at DOE defense nuclear facilities. 42 U.S.C. §§ 2286a(a)(5) and 2286(g). The Secretary of Energy must accept or reject, in whole or in part, the recommendations submitted by the Board within forty-five days after publication of the recommendation in the Federal Register. The Board may extend the period for response up to forty-five additional days. 42 U.S.C. § 2286d(b)(1). DOE then prepares an implementation plan for those portions of the recommendations which are accepted. The Secretary of Energy has ninety days after the publication of DOE's acceptance to transmit the plan to the Board (135 days with extension).

An assessment of the Board's effectiveness in achieving Congressional purposes for establishing the Board begins with an evaluation of the recommendation process, given

its centrality to the Board's oversight of public health and safety at defense nuclear facilities.

To date, the Board has issued thirty-one sets of recommendations to the Secretary of Energy, containing 139 individual specific recommendations. The Secretary of Energy has accepted all of the recommendations made by the Board in its first five years of operation, with the exception of the most recent dated December 30, 1994, which is in the process of being reviewed. Ten sets of recommendations have either been fully implemented or have been superseded or consolidated with subsequent recommendations. The remaining 21 are in various stages of implementation.

The report of the Senate Armed Services Committee on S. 1085, a forerunner to the bill which established the Board, stated that, above all, the Board should have a primary mission to identify the nature and consequences of any significant threats to public health and safety, to elevate such issues to the highest levels of authority, and to inform the public. S. Rep. No. 232, 100th Cong., 1st Sess. 20-21 (1987). As will be shown, the Board recommendation process for effecting safety improvements at defense nuclear facilities has proven to be sound in achieving the objectives. However, the ultimate goal of the recommendation process to actually improve the safety status of defense nuclear facilities is susceptible to delays, sometimes major ones.

Assessing the recommendation process requires several steps in which the constituent parts of the process are analyzed. For the process to work, the Board must have access to all relevant nuclear safety information. Meeting the first Congressional objective -- identifying significant threats to public health and safety -- is directly tied to the effectiveness of the Board's authorization for obtaining technical information necessary to develop recommendations.

1. Processes for Identifying Public Health and Safety Issues at Defense Nuclear Facilities

Congress provided the Board with a number of statutory tools which enable members to gather the information needed to perform the Board's mission. Hearings on safety issues may be conducted, and witnesses and documents subpoenaed if necessary, to secure testimony or evidence. 42 U.S.C. § 2286b(a). Alternatively, the Board may impose binding reporting requirements on DOE regarding health and safety matters at defense nuclear facilities. 42 U.S.C. § 2286b(d).

The Board's enabling statute provides that the Board shall investigate events or practices at defense nuclear facilities that have or may have an effect on public health and safety. The purpose of any such Board investigation shall be to determine whether DOE is adequately implementing safety standards, what the implications of such event or practice are for such standards, and whether such event or practice reflects a systemic

problem at other DOE facilities. Although the Board has plenary authority to make health and safety recommendations, the provision regarding investigations states that a purpose of the investigative process is to provide information for recommendations to the Secretary regarding changes in safety standards or their implementation. 42 U.S.C. § 2286a(a)(2). The report of the Senate Armed Services Committee on S. 1085 stated that the focus of the Board's investigations should be on preventing nuclear incidents from occurring. Priority should be given to preventing nuclear incidents which could significantly adversely affect the public health and safety. S. Rep. No. 232, 100th Cong., 1st Sess. 25 (1987).

The statute requires DOE and its contractors to "cooperate with the Board and provide the Board ready access to such facilities, personnel, and information as the Board considers necessary . . . ." 42 U.S.C. § 2286c(a). The statute also specifically authorizes access to two types of safety information: highly sensitive information on atomic weapons that is necessary to carry out the Board's functions, 42 U.S.C. § 2286a(b), and "design and operational data, including safety analysis reports, from any Department of Energy defense nuclear facility." 42 U.S.C. § 2286a(a)(3).

In practice, the Board identifies circumstances warranting safety recommendations through all these statutory means, as well as less formal information gathering. The Board's own activities during the first five years included numerous site visits, hearings, inquiries made of DOE technical and policy personnel, briefings, evaluations of technical reports and documents prepared by DOE, issuance of formal Board reporting requirements to DOE pursuant to 42 U.S.C. § 2286b(d), and similar avenues of gathering factual information regarding the safety status of defense nuclear facilities. Board staff, and expert consultants including permanent site representatives at the Pantex Plant and, the Hanford Site, substantially augment the safety information available to the Board with site visits, trip reports, technical assessments, and, in appropriate cases, inquiries or formal investigations of safety issues.

The Board and its staff have completed hundreds of technical reviews and assessments at defense nuclear facilities. In addition, numerous formal investigations of safety issues have been conducted. These reviews and investigations have led to safety improvements in a number of ways: directly, through the issuance and implementation of Board recommendations; indirectly, through DOE's use of the Board's investigative reports and other documents to correct safety deficiencies; and subtly through DOE interaction with Board staff. DOE has fully cooperated with Board requests under these provisions for access to information, personnel, and facilities, which have functioned precisely as Congress intended. The statute confers subpoena authority to force testimony or delivery of documents from any person at any place within the United States.

2. The Recommendation and Implementation Plan Process

As a result of the Board's efforts, safety improvements have been made at defense nuclear facilities after DOE acceptance and implementation of Board safety recommendations. Improvements have been made in such fundamental areas as operational readiness reviews; compliance with safety standards, orders and requirements at certain facilities; technical training at DOE sites; discipline of operations; the safe handling of nuclear materials; and radiation protection. However, the pace of progress has been slow, especially in increasing the number of qualified technical DOE personnel.

This progress has been bolstered by communications with DOE officials, such as the transmittal of staff trip reports on technical safety issues. At the Board's December 6, 1994 public hearing, the Secretary testified that the Board had assisted the Department in identifying and correcting public health and safety deficiencies at defense nuclear facilities. She elaborated by listing the key areas for which she was most appreciative of the Board's oversight. They included compliance with DOE safety requirements including Orders; hiring, retention, education, and training of DOE's technically-qualified personnel; readying facilities to operate safely, and conduct of operations.

The Board's own assessment of the extent of the improvements is presented, in detail, in the Board's annual reports to Congress, including Part 1 of this Report. Progress, and remaining difficulties, in DOE's development and implementation of adequate safety standards are analyzed in the next section as a part of the Board's assessment of efforts to accomplish Congressional objectives concerning safety standards.

a. Analysis of the Pace of DOE Implementation for Board Recommendations

The primary difficulty the Board has encountered in the first five years is not with obtaining requested safety information, identifying significant safety problems requiring DOE attention, developing recommendations, or having the Secretary of Energy accept them. Those functions of the Board have been successfully executed in accordance with Congressional objectives. The problem centers on subsequent inaction and failure to implement recommendations and corrective measures in a timely manner.

Congress clearly anticipated that Board recommendations would ordinarily be implemented within one year of finalization of the DOE plan.[2] This Congressional expectation has not been met, for a variety of reasons which will be analyzed later.

Table 1 lists each of the Board's recommendations, how long it took to obtain a response, implementation plan, and closure of the plan.

As can be seen from the Table, only ten sets of the thirty-one sets of Board recommendations have been closed. Seven were closed because they had been fully implemented. In the other three instances, delays in implementing the recommendations led to Board issuance of a new recommendation which incorporated and superseded the previous recommendation and addressed broader safety concerns. The remaining twenty-one recommendations are in various stages of implementation. For more than half of these recommendations, it has already been two years or more since an acceptable implementation plan was submitted.

An analysis of the recommendations closed through full implementation by DOE is instructive. With one exception, Recommendation 91-1 on DOE's Safety Standards Program, all of the fully-implemented recommendations dealt with specific safety problems at individual sites. Three involved operational readiness reviews (ORR) at the Savannah River Site, Rocky Flats, and WIPP. Only the recommendations dealing with ORRs were implemented within the one-year period of reference in the legislation. In those situations, DOE had strong internal incentives for wanting to comply expeditiously with Board recommendations; operations scheduled by DOE could not begin or resume until the ORRs were adequately completed and safety problems corrected.

Not unexpectedly, the converse of these findings is also true. The most difficult recommendations to implement and close address major systematic problems at all the sites within the defense nuclear complex, and often involve questions affecting both Defense Programs and Environmental Management. See Table 2. Of the recommendations applying to the entire complex, only Recommendation 91-1, which caused DOE to study the standards program for the complex, has been closed.

A more qualitative analysis also is possible based upon Board judgment of the first five years of operation. Generally speaking, recommendations issued in 1990, during the

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[2] If complete implementation of a plan is to take more than one year, the Secretary of Energy must submit a report to the Committees on Armed Services and on Appropriations of the Senate and the Speaker of the House of Representatives setting forth "the reasons for the delay and when implementation will be completed." 42 U.S.C. § 2286d(f)(1).

02/15/95

Table 1
Elapsed Times to Key Events Associated with Board Recommendations

Rec No	Subject	Issue Date	DOE Accepts	IPRev 0 Date	Date Board Accepts IP	Closure Date	Days to DOE Accept	Days to Develop Plan	Days to Revise	Days to Close	Elapsed Days to Closure (Issue to Close)	Total Elapsed Days to Date
90-1	Reactor Operator Training/Qualifications.	2/22/90	4/10/90	7/13/90	2/7/91	10/27/92	47	94	209	628	978	
90-2	Identify stds; assess adequacy; determine implementation.	3/8/90	6/12/90	9/17/90			96	97				1805
90-3	Monitoring and Corrective Actions for selected tanks.	3/27/90	5/16/90	8/13/90	10/12/90	5/1/92	50	89	60	567	766	
90-4	Conduct and content of ORR's for Rocky Flats buildings.	5/4/90	6/20/90	11/30/90	2/15/91	6/6/94	47	163	77	1207	1494	
90-5	Systematic Evaluation Program for Rocky Flats activities.	5/18/90	6/13/90	10/19/90	5/4/94		26	128	1293			1734
90-6	Develop program for removal of Plutonium in ducts.	6/5/90	7/24/90	11/30/90	5/17/92		49	129	626			1716
90-7	Expansion of Recommendation 90-3 to cover ferrocyanide tanks.	10/12/90	12/3/90	3/7/91	5/6/94		52	94	1156			1587
91-1	Improvement needed in DOE standards development program.	3/7/91	5/13/91	8/16/91	10/27/92	10/27/92	67	95	438	0	600	
91-2	ROMP closure packages and practices.	3/27/91	5/14/91	8/7/91	10/27/92	10/27/92	48	85	447	0	580	
91-3	WIPP Readiness Review.	4/25/91	6/5/91	8/7/91	10/27/92	10/27/92	41	63	447	0	551	
91-4	Expansion/clarification of R 90-4 on Bldg 559 ORR.	9/30/91	11/6/91	11/8/91	2/3/92	5/1/92	37	2	87	88	214	
91-5	Savannah River K Reactor Power Limits.	12/19/91	2/7/92	2/7/92	8/27/92	4/7/93	50	0	202	223	475	
91-6	Need for improved department-wide guidance on rad protection.	12/19/91	1/31/92	6/17/92	7/2/93		43	138	380			1154
92-1	Need for ORR on HB Line.	5/22/92	10/20/92	10/20/92	10/27/92	10/27/92	151	0	7	0	158	
92-2	Need for improvement in DOE Facility Representative Program.	5/28/92	7/20/92	11/5/92			53	108				993
92-3	Expansion on R 92-1; inadequacy of previous ORR's on HB Line.	5/29/92	9/15/92	9/21/92	10/16/92	2/3/93	109	6	25	110	250	
92-4	Improve Project Management and Design Control at Hanford MWTF.	7/6/92	8/28/92	2/5/93			53	161				954
92-5	Discipline of Operation during period of changes in mission.	8/17/92	12/16/92	12/21/92	1/8/93		121	5	18			912
92-6	Need for DOE guidance on content, timing and staffing for ORR's.	8/26/92	10/19/92	1/19/93	4/29/94		54	92	465			903
92-7	Need for broad improvement in DOE Training/Qualification Programs	9/22/92	1/19/93	11/4/93	11/4/93	11/4/93	119	289	0	0	408	
93-1	Need for consistency between Orders for weapons/production facils	1/21/93	4/27/93	7/19/93	7/30/93		96	83	11			755
93-2	Need for continued general purpose Department criticality program	3/23/93	5/12/93	8/10/93	9/30/93		50	90	51			694
93-3	Implement step change in DOE technical staff qualifications	6/1/93	6/23/93	11/4/93	11/5/93		22	134	1			624
93-4	Need for improved tech mgt and oversight of ERMC's.	6/16/93	8/6/93	11/8/93	11/18/93		51	94	10			609
93-5	Accelerate waste characterization program.	7/19/93	8/31/93	1/25/94	3/25/94		43	147	59			576
93-6	Need to retain access to capability/knowledge of weapons experts	12/10/93	2/2/94	7/5/94	8/2/94		54	153	28			432
94-1	Expedite remediation of SNM storage/stabilization/disposition	5/26/94	8/31/94				97					265
94-2	Comprehensive review of low-level waste program	9/14/94	10/28/94				44					154
94-3	Apply Sys Eng to dev prog for protection against nat.phenomena	9/26/94	11/18/94				53					142
94-4	Raise Conduct of Ops to acceptable level	9/27/94	11/18/94				52					141
94-5	Integrate DOE Safety Orders, Rules and other Requirements	12/29/94										48

*Incremental Days from Preceding Milestone Date

Legend:

ERMC Environmental Restoration Management Contract
IP Implementation Plan
MWTF Multi-function Waste Treatment Facility
ORR Operational Readiness Review
ROMP Reactor Operations Management Plan
SNM Special Nuclear Material
Stds Standards
WIPP Waste Isolation Pilot Plant

02/15/95

Table 2

Elapsed Time to Key Events Associated with Complex-Wide Board Recommendations

Rec No	Subject	Issue Date	Date DOE Accepts	Date submit IP Rev 0	Date Board Accepts IP	Closure Date	Days to DOE Accept	Days to Develop Plan	Days to Revise	Days to Close	Elapsed Days to Closure (Issue to Close)
90-2	Identify stds; assess adequacy; determine implementation.	3/8/90	6/12/90	9/17/90			96	97			
91-1	Improvement needed in DOE standards development program.	3/7/91	5/13/91	8/16/91	10/27/92	10/27/92	67	95	438	0	600
91-6	Need for improved department-wide guidance on rad protection.	12/19/91	1/31/92	6/17/92	7/2/93		43	138	380		
92-2	Need for improvement in DOE Facility Representative Program.	5/28/92	7/20/92	11/5/92			53	108			
92-5	Discipline of Operation during period of changes in mission.	8/17/92	12/16/92	12/21/92	1/8/93		121	5	18		
92-6	Need for DOE guidance on content, timing and staffing for ORR's.	8/26/92	10/19/92	1/19/93	4/29/94		54	92	465		
92-7	Need for broad improvement in DOE Training/Qualification Programs	9/22/92	1/19/93	11/4/93	11/4/93	11/4/93	119	289	0	0	408
93-1	Need for consistency between Orders for weapons/production facils	1/21/93	4/27/93	7/19/93	7/30/93		96	83	11		
93-2	Need for continued general purpose Department criticality program	3/23/93	5/12/93	8/10/93	9/30/93		50	90	51		
93-3	Implement step change in DOE technical staff qualifications	6/1/93	6/23/93	11/4/93	11/5/93		22	134	1		
93-4	Need for improved tech mgt and oversight of ERMC's.	6/16/93	8/6/93	11/8/93	11/18/93		51	94	10		
94-2	Comprehensive review of low-level waste program	9/14/94	10/28/94				44				
94-5	Integrate DOE Safety Orders, Rules and other Requirements	12/29/94									

*Incremental Time from Preceding Milestone Date

Legend:
ERMC Environmental Restoration Management Contract
IP Implementation Plan
ORR Operational Readiness Review
Stds Standards

first year of Board operation, have not been implemented in an expeditious fashion. Only two have been closed, one by complete implementation. This can be attributed in part to the learning process that both DOE and the Board went through in the first full year of Board operation.

Some individual sites have consistently implemented Board recommendations and safety improvements more rapidly than others. WIPP, the Savannah River Site, and the Pantex Plant have, in general, done the most expeditious work. On the other hand, implementation of Board recommendations at the Hanford Site and the National Laboratories has been exceedingly slow when compared to other sites. Rocky Flats efforts fall somewhere in between, with implementation of recommendations pertaining to specific buildings being completed more rapidly than more general recommendations.

Board recommendations on defense nuclear facilities can also be separated into subject matter categories for purposes of analysis: (1) qualification, recruitment, retention, training, and education of a competent technical workforce in DOE and contractor programs; (2) development and implementation of adequate safety standards, including orders, rules, and other requirements; (3) conduct of operations; (4) operational readiness review prior to resumption of operation; (5) systems engineering; (6) and safe storage and management of nuclear waste and residues.

An analysis of these subject-matter categories verifies findings stated previously and reveals a few others. Recommendations on operational readiness reviews are most successful; the safety improvements sought were implemented in a timely manner for the reasons already stated. They are, however, among the most narrow recommendations in scope. At the other end of the spectrum are recommendations which call for cultural changes throughout the complex in major safety systems and safety management, such as the DOE safety standards program or the recruitment, training, and education of technical personnel. These recommendations are being implemented far too slowly given their importance to safety at defense nuclear facilities. Similarly, dealing with safe storage, management, and disposition of nuclear waste and residues has proven to be one of the most intractable and difficult areas. This fact should come as no surprise to Congress or to the public. Nuclear waste cleanups are complex technically, and are subject to local political considerations and intense public scrutiny and skepticism.

Examining the recommendations in general, without reference to their subject matter or scope, one is able to identify those general characteristics of recommendations, and DOE's responses, which are indicators that implementation will proceed at an acceptable pace. Other things being equal: (1) the more specific and concrete the recommendation, the better the initial understanding of the problem; (2) DOE responses developed with true understanding of the safety issues involved pave the way for effective implementation; (3) commitment and involvement by DOE officials at the highest levels, and at the levels of implementation, are essential to success of the recommendation --

DOE must own the work; (4) clear allocation of responsibilities for implementing the recommendation, particularly between field and headquarters organizations; (5) appointment of a single DOE official with strong technical and leadership capability, who is ultimately responsible and accountable for completing implementation, aids the process a great deal; (6) inclusion of reasonable interim milestones and deadlines for completion of specific recommendations provides incentive and accountability; (7) early communication between DOE and Board staff at the response preparation stage, coupled with continued interaction during development of the implementation plan and its execution are key ingredients for progress; and (8) close monitoring and followup visits are necessary to assess progress and provide accountability.

b. Causes of the Delay: DOE Actions, Board Actions, Statutory Defect, or Some Combination of Causes

In the Board's first year of operation, it determined that one of the causes for delays in implementing recommendations was a DOE practice of accepting a recommendation for which there was insufficient understanding and commitment by officials charged with implementing the recommendation. Therefore, the Board issued Policy Statement 1 (55 Fed. Reg. 43,398 (1990)):[3]

> The Act anticipates responses which accept the Board's recommendations, and responses which reject the Board's recommendations, in whole or in part. As we have already learned from DOE's responses to the Board's first six recommendations, however, there is a whole range of possible written responses that the Board must be prepared to deal with in the future.
>
> * * * *
>
> [A]n evasive, nonresponsive, ambiguous, or unclear response which is labeled an acceptance by DOE is not adequate. The Board recognizes that a flawed response, if left uncorrected, will only lead to further problems in the implementation plan.

By issuing Policy Statement 1 and consistently applying it, the Board reduced the number of ineffective, ambiguous, and unclear responses. The Board, on occasion, still encounters the type of equivocal or conditional acceptances that characterized DOE's earliest responses that led to issuance of Policy Statement 1. More frequently, however, the impediments to expeditious implementation now surface at a subsequent stage in the recommendation process, during development of the implementation plan or later.

[3] The Policy Statement is reproduced in full in Appendix C.

The Policy Statement also addressed the need for implementation plans which demonstrate commitment to corrective action programs, understanding of the problems identified by the Board, and, most importantly, reasonable schedules for completing the implementation phase. Some DOE officials balked at development of schedules with deadlines for the very reason that they are necessary -- they provide accountability for completion of the recommended actions. Recommendation 90-2, which asked DOE to identify, assess for adequacy, and implement effective safety standards, orders, rules, and requirements, is a case in point. Even though it was the second recommendation issued by the Board in 1990, development of a schedule for implementation of 90-2 was resisted until November 9, 1994, when revision 5 of the implementation plan was submitted to the Board. Even then, after years of preparatory work, DOE's schedule for compliance with safety requirements at some sites extends to 1997, and beyond.

Recognizing the delays that characterized some of the Board's most important recommendations, the Board, in cooperation with the Secretary of Energy, sought ways to prevent unnecessary delays and to expedite implementation of recommendations. Beginning with Recommendation 93-3, the Board and DOE formally established joint task groups composed of senior staff members to negotiate and develop implementation plans with interim milestones and deadlines.

c. Possible Additional Corrective Actions

The measures taken by the Board and DOE have helped the recommendation process, but have not secured successful and timely DOE action to implement most recommendations. The problem of just getting DOE to do what it has committed to do in its implementation plans has resisted corrective action. The Board does not have authority to mandate action by DOE or to penalize inaction. One of the difficulties is that the causes for the delays may vary from recommendation to recommendation. Moreover, in most instances, a combination of causes thwart the implementation of a single recommendation.

In the first five years of operation, the Board has observed the following causes of delay: (1) the inherent resistance to change of a bureaucracy, particularly in response to external forces; (2) delays caused by DOE or contractor officials because they either did not understand, or refused to implement the recommendation in a timely fashion, even after acceptance by the Secretary of Energy (changing the safety culture of the DOE and its contractors has been difficult); (3) delegation of responsibility for fulfillment of commitments made by the Secretary of Energy to DOE contractors or officials who accord little attention or priority to the issues; (4) lack of sufficient technically-qualified personnel to execute the Implementation Plan and thus to correct problems; (5) the intractable nature and complexity of the systemic problems being addressed (in such cases, the expectation in legislation that implementation would be completed in a year proved unrealistic); (6) the perceived or actual need for additional resources or time to complete

implementation; and (7) the Board's need to learn how to use all the tools available to it to foster accountability and shorten delays.

The final item requires elaboration. The Board's enabling statute is, in the words of the D.C. Circuit Court of Appeals, "action forcing." For example, the broad powers given to the Board to obtain safety information necessary to execute its mission have been mentioned previously. The statute also provides for Board hearings on safety matters of concern to the Board, 42 U.S.C. § 2286b(a). The Board has learned that it can make more effective use of public hearings to determine the causes for DOE delays in implementing the recommendations and ultimately achieving safety improvements. The Board has found that questioning key DOE and contractor witnesses can provide several benefits. First, such probing in a formal setting focuses the witness on the need for obtaining technically supportable and reliable answers. The Board's authority to obtain information, under oath if necessary, is quite compelling.

Such hearings can also provide leverage and public and peer pressure to meet commitments contained in DOE implementation plans. They serve notice that unjustifiable delays will not be tolerated by the Board. The Board has used such hearings to good effect regarding the HB-Line ORR, at the Savannah River Site, and safety improvements for Buildings 559 and 707 at Rocky Flats. Questioning in public forums creates an atmosphere of accountability--that the Board intends to use every available vehicle to achieve safety progress. Section IV.B. more fully explores this and other options for achieving progress through better use of the Board's existing tools.

B. FOSTER THE DEVELOPMENT AND IMPLEMENTATION OF ADEQUATE DOE SAFETY STANDARDS INCLUDING ORDERS, RULES, AND OTHER REQUIREMENTS

CONGRESSIONAL OBJECTIVE: One of the Board's principal functions is to assist DOE's development and implementation of appropriate and operationally meaningful safety standards (including orders, regulations and requirements) at defense nuclear facilities. Congress challenged the Board and DOE to achieve the safety goal of comparability between DOE standards and those applied to commercial facilities.

Congress highlighted the importance of this function by listing it first among the Board's duties. Moreover, it is the only discrete function of the Board which explicitly contains Congressional illustrations of subject matter suitable for recommendations. Section 312(a)(1) of the Board's Enabling Act provides that the Board shall perform the following 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 (including all applicable Department of Energy orders, regulations, and requirements) at each Department of Energy defense nuclear facility. The Board shall recommend to the Secretary of Energy those specific measures that should be adopted to ensure that public health and safety are adequately protected. The Board shall include in its recommendations necessary changes in the content and implementation of such standards, as well as matters on which additional data or additional research is needed. 42 U.S.C. § 2286a(a)(1).

The report of the Senate Armed Services Committee on S. 1085 emphasized that the Board should be instrumental in helping DOE to develop appropriate and operationally meaningful safety standards and ensuring their translation into clear and consistent requirements for DOE management and contractors. S. Rep. No. 232, 100th Cong, 1st Sess. 20-21 (1987). Standards, and the insights, analyses, and expertise gained in defining them, provide the objective basis for measuring DOE and contractor safety performance, assessing the real safety status of facilities, and determining what must be done to permit continued safe operation of the complex. Congress recognized that adequate safety orders, rules, and other requirements were necessary in the interim while a reconfigured and new complex was structured to replace major elements of the existing increasingly obsolescent complex. Id. at 10. Similarly, Congress observed that the Board should distinguish between those instances which cannot be corrected by current safety procedures, and those where appropriate standards exist, but are not being adequately implemented. Id. at 24-25.

The basis for the Board's standards function, and the priority given to it by Congress, arose from the common understanding that DOE's defense nuclear facilities lacked an effective standards-based program for safety assurance. In the 1940's and 1950's, during the infancy of both commercial and defense applications of atomic energy work proceeded using safety measures and programs developed on an ad hoc basis for specific projects.

During the 1960's, operators of commercial atomic energy plants followed the lead of the Naval Nuclear Propulsion Program and began a strong move toward use of written standards. This move may also have been dictated in part by the realization that licensing of commercial facilities imposes a burden of proof which is difficult to satisfy without a solid reference base of written safety standards.

By the time of the Board's creation in 1988, the lack of an effective standards-based safety program within DOE had been made known to Congress through a variety of studies and assessments. At that time, the Department had an assemblage of "orders," many of which were out-of-date, poorly drafted, and haphazardly imposed upon operating

contractors. In its first annual report to Congress, the Board noted the root causes for these deficiencies:

> The reasons . . . include: lack of understanding among DOE managers of the importance of standards to safety; resistance by national laboratories and contractors to the use of standards; and lack of authority over DOE field offices by appropriate DOE officers in Headquarters. (Report at 17.)

This situation, and the emphasis of the Board's enabling statute on standards development and implementation, led to the issuance of Recommendation 90-2 shortly after the Board commenced operations. Recommendation 90-2 was intended to drive the Department towards an improved standards-based nuclear safety program.

Recommendation 90-2 was followed in early 1991 by Recommendation 91-1. This recommendation was spurred by the Board's continued concern. In the recommendation, the Board asked that the Department take a series of actions to place the standards development program on firmer ground:

- expeditiously issue a formal statement of its overall Nuclear Safety Policy;

- give increased attention to the qualifications and background of managers and technical staff assigned to the development and implementation of standards and that the numbers of personnel suited to this activity be increased commensurate with its importance;

- establish standards program officials access to the highest levels of DOE management;

- critically reexamine the existing infrastructure for standards development and implementation at Headquarters to determine if organizational or managerial changes are needed to (1) emphasize the priority and importance of standards to assuring public health and safety; (2) expand the program to facilitate the rapid development and implementation of standards; and (3) streamline the DOE approval process for standards; and

- reexamine the corresponding organizational units at DOE's principal Operations and Field Offices and DOE contractor organizations to determine if those organizations' standards infrastructure, responsibilities and resources would also benefit from changes to reflect improvements at Headquarters which strengthen and expedite standards development and implementation.

DOE was also requested to review a report regarding its standards prepared by the MITRE Corporation on behalf of the Board, and to expedite the issuance of revised safety orders and directives while formal rules were being developed and issued.

1. Progress in Developing and Implementing a Requirements-Based Safety Program During 1991-1994

Progress in implementing these recommendations was, from the start, sporadic and disorganized. In its 1992 annual report, the Board was forced to conclude its review of 90-2 progress on this pessimistic note:

> Having reviewed the [revised 90-2 implementation] plan, the Board has informed DOE that the plan and its implementation were unacceptable for reasons to be identified in a January letter.

This letter, issued January 24, 1992, informed DOE that its revised 90-2 implementation plan failed in numerous respects to meet the Board's published criteria for an acceptable implementation plan (Board Policy Statement 1). Most importantly, the plan did not provide a schedule for completion of identification of adequate safety standards (including DOE Orders, rules, and other requirements) at defense nuclear facilities and the plan lacked deadlines for compliance with all safety requirements.

The Board's 1993 report to Congress indicated that measurable progress was made by DOE during 1992 after rejection of the revised implementation plan. That progress related primarily to specific facilities identifying applicable DOE Orders and ensuring compliance as a part of the operational readiness review process. Progress in developing a complex-wide plan for implementation remained slow. Unfortunately, as explained by the Board in the 1994 annual report, revision 4 to the plan also had to be rejected:

> Major elements of DOE's Revision 4 to the Implementation Plan and, in particular, the Plan's compliance schedules were rejected by the Board . . . . Some schedules for completing identification, assessments for adequacy, and compliance with standards . . . were either lax, or absent from the plan altogether . . . a single, coherent DOE program for development and use of safety requirements as a fundamental base for self-regulation has not emerged. (Report at 6.)

The Secretary of Energy indicated her own dissatisfaction in not being able to trigger measurable progress in developing an adequate plan after four years. By memorandum of February 9, 1994, she directed her staff to correct the problem, noting that even the process of identifying all applicable standards was not complete, let alone meeting the imperative of actually complying with safety requirements on the books. Nevertheless,

it was not until November 9, 1994, that DOE delivered an acceptable implementation plan (Revision 5) for Recommendation 90-2.

In its most recent recommendation, 94-5, the Board turned to a series of potential problems generated by DOE's transfer of safety requirements from Orders to rules through formal rulemaking. The Board's main concerns were that in this transition process, ongoing safety upgrade programs would be substantially delayed to await completion of the rulemaking process, and important safety guidance and good practices would be lost. The Board also cited several recent DOE internal directives indicating that the transition process and the means by which all necessary requirements would be integrated were not well understood throughout the complex. For these reasons, the Board recommended on December 29, 1994, that DOE take a number of actions to ensure that (1) the Department's Safety Management Program is well understood by key technical and contract personnel, (2) the transition to rules is accomplished without loss of momentum on safety improvements and with proper coordination and integration of implementation plans, (3) a complete set of requirements needed for safe operations emerges from a combination of rules, orders, standards, and other directives, and (4) DOE contracts contain appropriate compliance provisions to ensure that the requirements-based safety management program is developed and imposed throughout the complex. The response by the Secretary is due on February 21, 1995.

2. Current Status

Five years after issuance of Recommendation 90-2, several conclusions can be drawn: (1) both Secretary Watkins and Secretary O'Leary have committed the Department to a requirements-based safety program; (2) DOE has made some progress in moving towards a requirements-based safety program; (3) unrelenting attention by the Board caused DOE to achieve an adequate level of compliance with standards before restarting several facilities shut down for safety reasons; (4) in response to several Board recommendations, DOE has now developed and issued a nuclear safety Order on operational readiness which, when properly used, is an effective tool for ensuring adequate protection of public health and safety prior to startup or restart of nuclear facilities; (5) a great deal of work remains to be done, both to erect a complete, adequate set of safety requirements for DOE's diverse operations and to implement these requirements at the field level; (6) the pace of forward progress may be slowed as a result of DOE efforts to make the transition from requirements now contained in safety Orders to requirements promulgated in rulemaking; and (7) resistance to requirements-based safety management continues to exist among contractors and within the Department itself.

The magnitude and complexity of the task ahead is indicated by the Department's own schedules for implementation of Recommendation 90-2. Revision 5 of the plan demonstrates that the task of just identifying requirements will take years for some facilities. The Board and DOE have identified the fifty-two existing DOE Orders

containing requirements considered essential to nuclear safety. Many of those have been revised and improved in the last few years. See Appendix D. Major rulemakings have been completed on radiation protection and quality assurance. Site requirement identification documents (S/RIDs) are being developed pursuant to the 90-2 implementation plan and will ultimately list all of the mandatory safety requirements applying to a particular defense nuclear site and facilities located there. S/RIDs are being developed and implemented throughout the complex, although not on an expedited basis. A major program led by EH to assess, consolidate, improve, and implement DOE requirements ranging from Department-wide policies to narrow technical standards was only started in 1993 and will require years to complete. Defining applicable requirements at defense nuclear facilities will not be sufficient in itself; safety assurance requires a demonstration of actual compliance. Some Defense Program facilities indicate that actual compliance assessments (so-called "Phase II" assessments) will extend to the year 2000 and beyond at many facilities.

In 1995 and beyond, the Department's progress toward a requirements-based nuclear safety program at defense nuclear facilities needs to continue and to accelerate. Standards development requires a technically competent, dedicated headquarters organization, while standards implementation requires similarly competent organization at headquarters, the field offices, and the contractors, plus an aggressive oversight, inspection and enforcement program. These tasks cannot be completed absent continued commitment by DOE management at the top level. In its responses to Recommendations 90-2 and 91-1, the Department repeatedly has promised to move forward on both fronts.

Compliance with standards at defense nuclear facilities has been driven almost entirely by the Board's recommendations and its refusal to accept poor performance. The concept of ensuring safety through compliance with standards is not yet firmly embedded in the Department or its contractors, and will require time to complete. A requirements-based process is still regarded within the DOE structure as an "add-on" to other tasks perceived as more important.

Nowhere has the transition to a requirements-based approach been more difficult than at DOE's national laboratories. Their resistance stems from the belief, not without some basis, that the constraints established in many DOE Orders, while appropriate for production facilities, are not appropriate for research and development activities. The Board has taken note of this concern, and its potential impact on the flexibility needed for creative defense-related nuclear research. The Board has initiated a new review of the presently-implemented safety management strategies at the laboratories, focusing on how the elements of those strategies compare with those for other operations of similar complexity and hazard level. During this review, the Board will evaluate whether the laboratories' safety management systems are equivalent to the intent of the DOE safety standards, even though different in detail.

C. RAISE THE TECHNICAL EXPERTISE AND VIGOR OF DOE SUBSTANTIALLY, AND HELP DEVELOP AND MONITOR DOE'S INTERNAL ENVIRONMENT, SAFETY AND HEALTH ORGANIZATION

CONGRESSIONAL MANDATE: The lack of a sufficient number of technically qualified program and oversight officials underlies all of the health and safety problems at defense nuclear facilities. Recognizing this, Congress, in the report of the Senate Armed Services Committee on S. 1085, stated that the Board is expected to raise the technical expertise for the Department substantially, to assist and monitor the continued development of DOE's internal EH organization, and to provide independent advice to the Secretary.

Applicable provisions of the Board's enabling statute implicitly require that the Board address the technical competence of DOE's personnel. For example, the Board is required to (1) review the content and implementation of safety standards and (2) investigate events or practices which either adversely affect or have the potential of adversely affecting public health or safety. 42 U.S.C. § 2286a(a).

1. Board Actions

In each of the first four annual reports, the Board recognized that the most important and far-reaching problem affecting the safety of DOE defense nuclear facilities is the difficulty in attracting and retaining personnel who are adequately qualified to provide the management, direction, and guidance essential for safe operation of DOE defense nuclear facilities. It remains the most critical problem today. In its fourth annual report, the Board summarized both the problem and its causes.

> The technical capabilities of DOE and contractor personnel have been an ongoing concern of both the Congress and the Board for a number of years. The United States Senate Report accompanying the Board's enabling legislation states that the "Board is expected to raise the technical expertise of the Department substantially . . . ." The health and safety of the public and workers rest on a properly trained workforce accomplishing tasks in a formal, deliberate fashion in accordance with reviewed and approved procedures. Implementation of effective training and qualification programs and disciplined conduct of operations are essential to establishing a technically competent work force. As a result, many of the Board's recommendations have stressed training and conduct of operations.
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> * * * *

> Nevertheless, in recent years there has been little noticeable improvement in the scientific and technical expertise in the defense nuclear facilities complex . . . . Unlike other federal agencies which rely upon technical competency, such as the Nuclear Regulatory Commission, the National Science Foundation, and the Board, DOE does not have excepted appointment authority. It is seriously encumbered by antiquated Civil Service restrictions that discourage bright, technically-qualified persons from being initially hired and subsequently promoted to positions of responsibility.
>
> The lack of significant numbers of qualified technical personnel in DOE's oversight and line organizations is a serious issue. In some instances, the Board has provided a level of technical review for DOE that goes beyond the traditional bounds of external oversight.

To address the need for technically-qualified personnel within DOE, the Board issued Recommendation 93-3. Recommendation 93-3 urged DOE to take dramatic action to attract and retain scientific and technical personnel of exceptional qualities. The Board urged that DOE take the following initiatives at Headquarters and in the field.

(1) Establish the attraction and retention of scientific and technical personnel of exceptional qualities as a primary agency-wide goal.

(2) Take the following specific actions in the interest of achieving this goal:

   a. Seek excepted appointment authority for a selected number of key positions for engineering and scientific personnel in DOE programmatic offices, in other line units, and in the oversight units responsible for the defense nuclear complex; and

   b. Establish a technical personnel manager within the Office of the Secretary to coordinate recruitment, classification, training, and qualification programs for technical personnel in defense nuclear programs.

(3) Develop a broad-based DOE program for improving qualification, education, and training of technical personnel.

Finally, the recommendation called for baseline and continuing assessments of DOE's technical personnel initiatives by groups both internal and external to DOE. The Secretary of Energy accepted Recommendation 93-3 on July 23, 1993.

Much earlier, in 1990, Recommendation 90-1, the first formal recommendation by the Board, called for implementation of effective training and qualification at the K-Reactor at the Savannah River Site. DOE action resulted in a successful training program. During 1993, the staff of the Replacement Tritium Facility at the Savannah River Site used the lessons learned at the K-Reactor and subsequently became the first DOE facility to have a fully accredited technical training program. However, DOE has not extended this proven approach to other defense nuclear facilities at the Savannah River Site or to facilities at other sites.

Assessments in 1992 at the Hanford Site, the Pantex Plant, non-reactor facilities at the Savannah River Site, the Y-12 Plant at the Oak Ridge Reservation, and the Rocky Flats Environmental Technology Site clearly demonstrated the need to strengthen training of technical personnel. As a result, Recommendation 92-7 proposed that DOE take strong action to improve qualification and training at those sites. DOE's initial Implementation Plan, submitted in June 1993, was determined by the Board to be unacceptable as a means for achieving the needed improvements. DOE did not correct the deficiencies in this Implementation Plan until the initiatives of Recommendation 92-7 were embraced by the even broader-based Board Recommendation 93-3. To address several overlapping elements of Recommendations 92-7 and Recommendation 93-3, the Secretary proposed and the Board accepted that a single Implementation Plan be developed for these two related recommendations. DOE submitted a combined Implementation Plan that was accepted by the Board on November 5, 1993. All actions covered by the Implementation Plan are scheduled to be completed by December 1995.

Unique talents are now being lost from DOE and its weapons complex through down-sizing. This problem is particularly acute for the weapons laboratories and the facilities involved in the assembly, disassembly, and testing of weapons, where budget pressures and other constraints are leading to the severe erosion of the talent pools upon which much of the weapons program has depended. In Recommendation 93-6, issued in December 1993, the Board urged DOE to:

(1) develop a formal program to identify the skills and knowledge needed to develop safe weapons dismantlement and modification procedures for all remaining nuclear weapons, and to safely conduct nuclear testing;

(2) institute a practice whereby personnel losses from the complex are reviewed to assess their impact on required safety-related capabilities;

(3) develop a means to ensure continued access to necessary capabilities through the use of personnel retention, new hires and consulting arrangements, programs to document the knowledge of highly expert personnel, and the development of detailed procedures to guide people who will follow;

(4) develop an integrated program to maintain nuclear weapons testing expertise at the Nevada Test Site (NTS); and

(5) reevaluate the traditional reliance on administrative controls to ensure nuclear explosive safety at NTS, given the ongoing loss of personnel.

The Secretary of Energy accepted Recommendation 93-6 on February 2, 1994, and submitted an Implementation Plan to the Board on July 5, 1994. The Board accepted the Implementation Plan on August 2, 1994. All programs necessary for the continuing implementation of the individual recommendations are scheduled to be in place by March 1995.

The capability to conduct criticality experiments is an example of the technical expertise which must be maintained. In Recommendation 93-2, issued on March 23, 1993, the Board recommended that DOE:

(1) retain its program of general purpose criticality experiments,

(2) direct the program along the lines satisfying the objectives of improving the information base underlying prediction of criticality, and serving in the education of criticality engineers, and

(3) using the results and resources of the program in ongoing departmental programs where nuclear criticality would be an important concern.

The Secretary of Energy accepted Recommendation 93-2 on May 13, 1993, and submitted an Implementation Plan to the Board on August 10, 1993. The Board accepted the Implementation Plan for Recommendation 93-2 on September 30, 1993.

2. Status of DOE Actions to Date on Technical Personnel Issues

DOE made notable progress responding to Recommendation 93-3 by obtaining additional excepted appointment authority as recommended by the Board. Section 3163 of the National Defense Authorization Act for Fiscal Year 1995, Pub. L. 103-337, authorized DOE to establish up to 200 additional excepted service positions for scientific, engineering, and technical personnel whose duties will relate to safety at defense nuclear facilities.[4] Obtaining this legislative change took many months and the combined efforts of the Board and DOE. Appropriate pay levels may be set, and individuals may be hired to fill such positions, without use of the procedural steps which encumber civil service.

[4] This addition of 200 raised the total number of excepted service positions at DOE to 400.

Excepted service anticipates all of the essential features of the National Performance Review (NPR), is fully consistent with the goals and specific recruitment programs called for in the NPR, and will easily dovetail into the Administration's program if NPR legislation is eventually passed.

DOE designated a Technical Personnel Program Coordinator and recruited an excellent group of technical interns. DOE attempted to improve the Department's ability to recruit and retain technically competent personnel by issuing an Administrative Flexibilities Handbook, developing new guidance related to career planning, and developing a qualification program for technical personnel. Contractor training and qualification have improved, as shown by more timely approval of the contractors' Training Implementation Matrices and improvements in the training of operators at facilities such as the Savannah River Site Replacement Tritium Facility and at the Pantex Plant. Additional effort is required to extend these success to facilities across the complex.

On the other hand, DOE has made much less progress in actually hiring qualified technical personnel for key Office of Defense Programs (DP) line and oversight positions. The hard-won authority to hire technical personnel under excepted appointments has been little used to date. Failure to immediately begin using its excepted appointment authority is one of the central obstacles to developing a technically qualified staff at DOE. The Offices of Environmental Management (EM) and Environment, Safety and Health (EH) have recruited and hired technical personnel, although without full consideration of the goals and standards called for by Recommendation 93-3. Additionally, it is unclear what percentage of the new hires will be devoted to technical positions involved with nuclear safety. DOE officials initially intended that excepted service positions would not be allocated to DP. At the public hearing on December 6, 1994, the Secretary of Energy and other high-level DOE officials told the Board that additional excepted service positions would be allocated to DP organizations. The exact number remains in question. A detailed evaluation is to be performed by DOE to address the numbers of staff required as well as the qualifications and competencies that staff members must possess. In describing this review, the Under Secretary of Energy stated: "To the best of my knowledge, the Defense Programs staffing evaluation is unique in the history of this Department." The Board will follow the progress of this vital study closely.

As a part of a broad-based program for improving the qualification of its technical personnel, DOE is now developing and implementing technical qualification standards for DOE employees. However, draft technical personnel qualification standards that have been developed by DOE and reviewed by the Board and its staff lack the rigor necessary to cause a significant upgrade in the technical competence of DOE. A baseline external review of DOE's technical personnel initiatives has been completed by the National Academy of Public Administration (NAPA). Unfortunately, the review fell far short of

the plenary review anticipated by the recommendation since it was restricted to DOE headquarters and did not include field operations.

While preparing the Implementation Plan for Recommendation 93-3, DOE officials stated a preference for curing technical deficiencies by education and training of the existing workforce as opposed to hiring new talent. This preference appears to be even stronger due to mandated personnel reductions, but progress on training and education lags. DOE's education and training efforts reviewed by the Board and its staff, however, are off-target. They are directed towards a superficial level of knowledge rather than a fundamental understanding of nuclear systems and processes. Full implementation of the Board's recommendations to upgrade DOE's level of technical competence is in jeopardy due to a lack of buy-in by DOE line management.

To maintain the capability to perform criticality experiments as recommended by Recommendation 93-2, DOE has performed a systems analysis to identify the necessary resources and personnel needs. In the limited area of criticality experiments, DOE has identified the resources and funding necessary to support current and anticipated requirements for conducting critical experiments and for training criticality experts and has established the Nuclear Criticality Experiments Steering Committee (NCESC) as a standing committee to oversee and coordinate the DOE criticality experiments program. The NCESC is addressing key issues regarding nuclear criticality experiment capabilities, identifying resource requirements, and justifying necessary funding.

Recommendation 93-6 addressed retention of weapons-related technical expertise, particularly at the national weapon laboratories, in a down-sized weapons complex. DOE prepared the Implementation Plan to complement the Stockpile Stewardship Strategy and the Stockpile Management Plan, which it also was developing. The Implementation Plan provides for a formal Integrated Safety Skills and Knowledge Platform (ISSKP) to identify the skills and knowledge needed to disassemble, modify, and test nuclear weapons. That platform will identify and record needed skills and knowledge. DOE intends to integrate the ISSKP with weapons testing and disassembly procedures, and plans to implement a program to document skills and knowledge by March 1995. DOE also has initiated a review of administrative controls and engineered safeguards which ensure nuclear explosive safety at the Nevada Test Site. DOE plans to validate and update weapons disassembly procedures by September 1995. DOE also committed to review the engineered safeguards and administrative controls for the Nevada Test Site and incorporate any necessary changes by February 1995.

By failing to satisfactorily complete many of the near-term initiatives identified in the Recommendation 93-6 Implementation Plan, DOE has placed the overall schedule in jeopardy. DOE has yet to clearly identify the critical functional areas that support safe dismantlement or modification procedures for weapons or all of the key positions critical

to safe testing operations. DOE also has failed to demonstrate a methodology or structured interview process to capture and preserve usable information.

However, DOE's ability to capture and preserve expertise as identified in Recommendation 93-6 has been strengthened by the recently-enacted section 3131 of the National Defense Authorization Act for Fiscal Year 1995. This section authorizes DOE to conduct a stockpile stewardship recruitment and training program at the national laboratories and to establish a "retiree corps" of retired scientists who have expertise in nuclear weapons research and development.

DP is challenged to increase the number of well-qualified technical personnel at a time when DP's organization staffing level is being decreased. Current staffing levels, as well as the skill mix of DOE, laboratory and contractor personnel, appear to be inadequate to meet the requirements of the existing defense nuclear safety program. These deficiencies have been highlighted by the Board on several occasions, but have not been corrected. Most notable is the lack of sufficient numbers of trained safety analysis personnel. This contributes to Safety Analysis Reports that are incomplete and unapproved, Nuclear Explosive Safety Studies (NESS) that are out of date and unapproved, and Nuclear Explosive Risk Assessments, initially required in 1990 for every NESS, that are not yet fully implemented.

The DOE Implementation Plan for Recommendation 93-6 committed to an immediate review of the current status of DP staffing to identify the need for additional, technically competent personnel. This review and other near-term initiatives identified in the Implementation Plan have not been completed, thereby jeopardizing the goal of maintaining access to nuclear weapons expertise. DP organizational elements that are focused on the safe operation of the defense nuclear complex need to be supplemented, not reduced, as currently planned.

DOE has made limited progress in response to Board recommendations in the areas of training and worker qualification. Actions in response to the Board's first formal recommendation, Recommendation 90-1, which called for an effective training and qualification program at the Savannah River Site K-Reactor, resulted in a successful training program. Lessons learned at the K-Reactor were of significant use during the startup of the Replacement Tritium Facility at Savannah River. DOE has not, however, applied these lessons to other defense nuclear facilities. DOE's failure to extend the training and qualification improvements to other sites resulted in the Board issuing Recommendation 92-7 and the even broader-based Recommendation 93-3. The Implementation Plan for Recommendation 93-3, which was approved in November 1993, embraced the initiatives of Recommendation 92-7, and calls for the completion of all actions by December 1995. Nevertheless, some DOE complex-wide training and worker qualification improvements are not currently scheduled to be fully implemented until the end of 1998.

Other problems in the recruitment, retention, and training of personnel persist throughout the Department. DOE has hired few new managers either at the mid-level or at more senior levels of management, where the initiatives of Recommendation 93-3 can have the most effect. Further, no consideration has been given to using the Technical Qualification Standards being developed under this recommendation as an integral part of the hiring process. There is little evidence that senior managers at DP, EM, and EH have matched the efforts of the Office of Human Resources (HR) to implement the precepts of Recommendation 93-3 to improve their organizations. Personal involvement by the Assistant Secretaries is essential to full implementation of the recommendation, but has yet to be fully realized.

D. REVIEW DOE SAFETY MANAGEMENT, OVERSIGHT, AND ENFORCEMENT PROGRAMS

CONGRESSIONAL MANDATE: Recognizing the paramount importance of DOE's own safety programs, Congress required the Board to oversee, monitor, and assist DOE's internal management and oversight of safety at defense nuclear facilities.

Defense nuclear facilities are maintained and operated by contractors under the direction, guidance, and oversight of federal employees of the DOE. DOE has over the years developed those requirements the Department considered necessary to assure public health and safety, protection of property, and national defense and security. These requirements have been promulgated in a variety of documents, referred to as "safety standards" by the Board's enabling statute. Current DOE contracts list or reference those DOE safety orders that are applicable to the facilities covered by the contract. The DOE is currently in the process of transitioning from an Order system to rules as the means for promulgating and implementing these nuclear safety requirements.

DOE's move toward use of a standards-based safety management program is consistent with both national and international practices for assuring nuclear safety. While the basic approach is sound, DOE's implementation, oversight of contractor compliance with, and enforcement of its own standards has not been effectively executed. This matter is discussed in sections that follow.

1. The Primacy of Line Management Responsibility for Safety

The Board and DOE have often recounted the principle that line management bears the primary responsibility for safe operation of defense nuclear facilities. So long as defense nuclear facilities remain the responsibility of DOE, there will be need for strong DOE line management. No amount of oversight, whether internal or external, can compensate for a line management which is neither dedicated to safety nor competent to achieve it.

This principle has been enunciated by both the previous and current Secretaries of Energy. In SEN-6-89, issued May 19, 1989, Secretary Watkins stated:

> Establishment of direct line responsibility is essential to assure the successful accomplishment of major DOE programs, including the Savannah River restart effort.
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> In furtherance of the philosophy that the Department of Energy consists of line organizations fully responsible for their own activities, it is my intent that operational programs and activities related to environmental protection, radiation and reactor safety, and worker and public health and safety be included in those responsibilities.

Secretary O'Leary reiterated this precept in a December 2, 1994 memorandum to Secretarial Officers and Managers of Field Elements:

> This memorandum reemphasizes my commitment to strengthening the Department's nuclear safety program through a comprehensive management program that ensures full accountability for safety.
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> The Department's nuclear safety program is based on five guiding principles:
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> - Line management is responsible for safety;
> - Comprehensive requirements are in place;
> - Competence is commensurate with responsibilities;
> - Oversight is strong and independent; and
> - Enforcement is precise, meaningful, and swift.

The Department must accelerate improvement in the effectiveness and competence of line management within DOE and contractor organizations, irrespective of whether oversight is accomplished internally, by external oversight similar to the Board's, or by an outside regulator.

2. DOE Oversight of Nuclear Safety

The Board was created after Congress perceived that DOE had failed to provide necessary line, oversight, and enforcement mechanisms to adequately protect public health and safety at defense nuclear facilities. A review of DOE's oversight and enforcement programs was necessary to fulfill several aspects of the requirements for the Fifth Annual

Report. First, Congress mandated that the Board review the content and implementation of DOE safety standards. Line management has primary responsibility for implementation of such standards. Internal oversight by DOE serves as the second tier of safety defense in the event line management fails to effectively uncover and correct problems in safety systems and practices. Enforcement mechanisms, either by contract implementation, penalties under Price-Anderson Act amendments, or use of the contractor fee award system, are available by DOE when contractor compliance with safety requirements is not forthcoming.

As the Board reported to Congress in several annual reports, DOE has not effectively used its internal oversight tools. Too often the Board has uncovered safety problems which should have been discovered and resolved by DOE. Thus, the effectiveness of DOE oversight and enforcement is directly related to future Board oversight operations. Moreover, an assessment of DOE's oversight and enforcement programs is germane to the evaluation of options for external oversight or regulation of the complex.

The principles of effective nuclear safety oversight have been identified long ago by organizations such as the International Atomic Energy Agency, the Institute for Nuclear Power Operations (INPO), NRC, Naval Reactors, and others.

- Independence of line management and oversight
- Technical expertise of line management and oversight organizations
- Access to facilities as needed and ability to perform reviews
- Clear authority to require the line organization to address the oversight findings and recommendations
- A system to provide public access to the organization's findings and recommendations

The first of these elements, independence, is universally recognized as a sine qua non of any management system designed to ensure safety by separation of oversight from operational responsibilities. See, e.g., Basic Safety Principles for Nuclear Power Plants, International Atomic Energy Agency Safety Series No. 75-INSAG-3 (1988); NRC Regulation 10 C.F.R. Part 50, Appendix B, "Quality Assurance"; A Safety Assessment of Department of Energy Nuclear Reactors, DOE/US-0005 (1981). The Board and its staff have analyzed DOE internal oversight programs using these key principles.

The Board's creation by Congress was stimulated in part by DOE's inability to construct two key elements of safety assurance: (1) a competent line management

organization dedicated to safety, and (2) a strong, independent safety oversight organization operating as a check on line management. In 1989, then Secretary of Energy Admiral Watkins emphasized both of these elements in SEN-11-89, which was acknowledged and quoted by the Board in its 1991 Annual Report at page 30:

> Addressing the issue of DOE accountability for such matters as health and safety, the Secretary noted that "the very large majority of our work in the field is actually carried out by contractors." "But," he continued, "this fact in no way relieves DOE managers of their governmental responsibilities to assure that contractors' primary duties are performed in accordance with expected high standards of professional excellence." This acknowledgment of DOE responsibility is of fundamental importance to assuring health and safety.
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> Another objective of the Secretary was to "[s]trengthen independent internal oversight responsibilities within Environment, Safety and Health (EH) and other designated offices ... as required to monitor effectiveness of DOE management in execution of policies set forth by DOE, particularly in areas of environment, safety, health, and security." (Annual Report. Emphasis in original.)

During the four-year period since the 1991 report, DOE's progress in improving the competence and safety focus of line management and in constructing a vigorous internal oversight program has been slow.

One major disruption in the process of improvement was unavoidable: a change of Presidential administrations. The appointment of a new Secretary of Energy in 1992, with a very different background and perspective from the outgoing Secretary, resulted in a period of uncertainty within DOE followed by major changes in the Department's line and oversight structure. The Office of Nuclear Safety (ONS), created by Secretary Watkins as an independent safety oversight group reporting directly to the Office of the Secretary, was transferred to the Assistant Secretary for Environment, Safety and Health (EH).

In 1994, EH, which had absorbed ONS, was reorganized to provide two basic functions: technical assistance to line management and oversight. The details of that reorganization were finalized and announced on December 5, 1994. Therefore, the Board is unable to assess fully how the new oversight office will function. For example, it is, as yet, unclear what level of staffing will be provided to independent internal oversight and enforcement, traditional roles assigned to EH, compared with the technical assistance

function. A single office reporting to the Assistant Secretary for EH has been given complex-wide oversight duties. Enforcement as a compliance tool still has not been used by DOE. Finally, DOE needs to accelerate efforts in acquiring a cadre of well-qualified safety professionals in both line management and oversight positions to assure safety.

The latest DOE reorganization of EH places oversight in an independent unit within EH. The Board issued on May 6, 1994, a letter to DOE requesting detailed information on the reorganization. The Department's response was provided to the Board on October 21, 1994. During the past several months, the Board has been studying this response and is tracking DOE's implementation of the organizational structure described in it. Additional information has been received recently in the form of DOE's report to Congress regarding its organizational structure and programs for internal oversight, pursuant to the Cohen Amendment, in Section 3163, Pub. L. 103-337, National Defense Authorization Act for Fiscal Year 1995.

In the Board's view, it remains an open question whether strong, independent safety oversight and enforcement programs will emerge from the reorganization. The new structure for oversight in EH is workable provided that (1) the new Office of Oversight is adequately staffed with technically qualified personnel, (2) the Office's independence is maintained, and (3) its findings receive full attention by line management. The independence and capability of the enforcement unit within EH remain to be demonstrated. Both the Secretary and the Assistant Secretary for EH have publicly stated that DOE welcomes external oversight of health and safety matters.

As the Board has stated in several of its past reports, DOE's failure to provide effective internal independent oversight has caused the Board to substitute its own resources for those of DOE in many cases. Instead of being the last line of safety defense, as external oversight should be, the Board and its staff often substitute for internal oversight.

3. Legal and Organizational Bases for Oversight and Enforcement

The Board analyzed specific aspects of DOE's current capability to internally oversee and enforce compliance with safety standards at defense nuclear facilities. A broad, common sense definition of enforcement -- insisting that the contractor achieve compliance with safety requirements -- was used for the analysis, rather than only looking at the Price-Anderson penalty process. The analysis reviewed the EH organization and infrastructure; legal authority to conduct meaningful oversight and enforcement, including statutory provisions, regulations, orders, and contract provisions impacting nuclear safety; and DOE activities which demonstrate commitment to internal oversight and enforcement.

The Board concluded that the Atomic Energy Act provides for an internal DOE oversight and enforcement program of nuclear safety in the defense complex. However,

DOE has not effectively implemented that statutory authority. DOE has been slow to develop or implement the site and facility-specific requirements which serve as the measuring stick for compliance.

a. Statutory Authority

DOE has always held statutory authority to oversee its contractors and enforce compliance with safety requirements at defense nuclear facilities. The Atomic Energy Act of 1954 provided that the Atomic Energy Commission (and its successor agencies) would "establish . . . standards and instructions . . . to protect health or to minimize danger to life or property." 42 U.S.C. § 2201(b). Prior to the Price-Anderson Act Amendments to the Atomic Energy Act in 1988, the principal tools available to DOE for achieving these purposes were DOE safety orders, which could be imposed by contract requirements. DOE also possessed the authority to issue and enforce legally binding regulations, after public notice and comment, and to issue administrative orders of compliance with safety requirements under the Atomic Energy Act and the Administrative Procedure Act. That authority was elaborated upon in section 501 of the Department of Energy Organization Act of 1977. 42 U.S.C. § 7191. In recent history DOE has not effectively invoked these processes and legal mandates to require compliance with existing safety standards.

Briefly, the Price-Anderson Act Amendments of 1988 authorized DOE to impose civil penalties upon its indemnified contractors (other than not-for-profit contractors such as universities).[5] Civil penalties can be levied only for those violations of nuclear safety regulations and orders which have been issued according to the requirements of the Administrative Procedure Act. For regulations this means (at a minimum) notice and opportunity to comment by the public and regulated parties; for orders, it means that after formal issuance of the order, the contractor has the right to request an adjudicatory hearing.

The Department began work on procedural and substantive rules to carry out the Price-Anderson mandate in 1989. The procedural rule containing the Department's enforcement policy and penalty procedures for Price-Anderson were issued in final form on August 17, 1993.[6] To date, two final substantive nuclear safety rules have been issued: Occupational Radiation Protection, on December 14, 1993,[7] and Quality

[5] Atomic Energy Act of 1954, as amended, Section 234A, 42 U.S.C. § 2282a.

[6] 10 C.F.R. Part 820.

[7] 10 C.F.R. Part 835.

Assurance on April 5, 1994.[8] The radiation protection regulation by its own terms delays enforcement for two years. Several other rules have been noticed for comment, including Nuclear Safety Management, published in draft on December 9, 1991, and Radiation Protection of the Public and the Environment, published in draft on March 25, 1993.[9] Others have been noticed or are scheduled to be noticed shortly. In the meantime, the immediate past and present Secretaries of Energy have stated that current DOE safety orders apply until compliance with the rules is achieved.

b. Organizational Issues

The Department recognized the necessity of placing oversight of DOE field offices and contractors in the hands of DOE employees outside of line management. In 1990, DOE organized an internal oversight and enforcement division within the Office of Nuclear Safety, headed by a former NRC attorney and staffed with trained investigators. The creation of the Office of Nuclear Safety by then Secretary Watkins provided a locus for those powers. A logical first mission for the oversight and enforcement units would have been enforcement of DOE safety Orders imposed by contract, until the civil penalty and compliance order powers became effective via rulemaking. Under Secretary Watkins, the enforcement and oversight units in ONS initiated no enforcement actions, but did investigate allegations of contractor misconduct.

With a new Administration, the Departmental reorganization initiated in 1992 led to consolidation of nuclear safety functions with other environment, safety and health units within EH. As a result of Secretary O'Leary's reorganization of the Department, ONS was dissolved and its functions assigned to EH. To date, the oversight and enforcement units have not focused on standard/order-based compliance assessments and have issued no compliance orders or enforcement actions under either the 1954 Atomic Energy Act or the Price-Anderson amendments to it. Major enforcement actions predicated on safety rules are unlikely before 1996 when compliance with the new Occupational Radiation Protection rule should be implemented by contractors. The oversight and enforcement units also have not played an effective role in the enforcement of existing DOE Orders under contracts to date.

c. Enforcement Issues

At some level within the Department, decisions must be made which weigh enforcement against other Departmental priorities. The highest level at which this convergence can occur is the Secretary. Delegation of enforcement power below the level

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[8] 10 C.F.R. Part 830.

[9] 10 C.F.R. Parts 830 and 834, respectively.

of Assistant Secretary is unlikely, given that the power derives directly from the Atomic Energy Act and its exercise can have major programmatic effects. If one eliminates line management offices because of conflicts-of-interest, few options are left; among them are the Office of Environment, Safety and Health (EH), the Office of Inspector General (IG), and the Office of General Counsel.[10] A fourth option is a separate office reporting directly to the Secretary, Deputy Secretary, or Under Secretary.

The term "enforcement" refers to agency powers (1) to demand certain actions by a regulated party, usually to correct deficiencies measured against agency criteria, and/or (2) to impose monetary or other penalties for violations of specified requirements (as an incentive to avoid such violations in the future). Federal agencies with regulatory powers have statutory enforcement authority, which must be exercised in accordance with the Administrative Procedure Act.[11]

An agency enforcement program must be based upon requirements imposed through legal documents. The Department has available to it three principal mechanisms by which binding requirements can be imposed on contractors: contract provisions (usually by incorporation of safety orders and other standards), rules issued by notice and comment, and compliance orders issued by the Secretary under 10 C.F.R. Part 820.[12] Until recently, the Department "used" the first method (contracts) exclusively despite the direction of Congress in 1988 to also use rules and orders issued under the Administrative Procedure Act. The Department's procedural rules allow civil penalties to be imposed for contractor violations of rules or compliance orders, or for failing to carry out programs and plans to meet such rules or orders.[13]

Enforcement via contract terms has the advantage of being timely when compared to a rule/civil penalty approach. Contracts can be modified to incorporate DOE Orders within a period of months, and most (if not all) M&O contracts now contain terms which address compliance with those Orders. Such terms vary from contract to contract. DOE

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[10] OGC apparently was considered as a locus for the enforcement division during the reorganization. It remains a candidate.

[11] 5 U.S.C. § 551 et seq.

[12] While Subpart C of Part 820 refers to the issuance of compliance orders by "the Secretary," it does not bar delegation of this authority to other levels of the Department. Thus, compliance order authority could be delegated to Assistant Secretaries with jurisdiction over specific classes of facilities (DP, EM, etc.).

[13] See 10 C.F.R. § 820.20(b).

has not uniformly imposed terms which insure adequate attention to the Orders, and the terms contained in some contracts can be circumvented or avoided.

The Board's strong emphasis on compliance with applicable safety requirements in DOE Orders, among other factors, has spurred the Department to add more explicit compliance terms to contracts and to actually incorporate DOE nuclear safety Orders by reference into some contracts. The Fernald environmental management contract contains such an Order compliance provision. At least theoretically, a for-profit contractor's award can be reduced because of failure to comply with safety Orders imposed in the contract. In the terms of contract law, DOE is in a position to demand specific performance of the contract's terms as a condition for the award. Specific performance can include strict compliance with Orders and other standards where those requirements are specifically incorporated into the contract.

Congress decided in 1988, however, that enforcement of nuclear safety requirements include applicable rules, regulations, and orders, and provided a penalty system for violation of those requirements. Promulgation of rules allows participation by both directly affected parties (contractors) and the general public. A compliance order directed to a given contractor can be challenged by that contractor in a hearing, and in such a hearing, intervention by other affected parties is possible. A civil penalty issued for violation of a rule or order can be challenged in a hearing by the penalized party, and intervention also is possible in this type of proceeding.

The recently-issued Part 835 regarding occupational radiation protection gives an "effective date" thirty days after the rule's publication, but builds in an implementation process which allows non-compliance until January 1996. This is a surprising schedule given that the rule's technical content is based directly on existing DOE Orders and the Radiological Control Manual. The Quality Assurance rule is cause for even greater concern. The effective date for enforcement of that rule is potentially open-ended.

DOE's enforcement program, however, need not await promulgation of the entire set of safety rules envisioned by Price-Anderson. Compliance orders or notices of violation under Price-Anderson could be issued by the Secretary or her delegate at any time for contractor violation of safety requirements which are binding on the contractor as a matter of contract law. This would include non-compliance with any requirement taken from safety Orders incorporated into the contract or from rules promulgated by DOE after notice and opportunity for comment. Although civil penalties per se can be levied only for rule violations, DOE could under current authority issue demands for specific contract performance coupled with contract penalties (such as award fee reductions) if the demand is not met. Issuing a "notice of safety violation" has a compliance-forcing impact, even when the notice does not express an intent to seek a penalty. To date, none of these existing enforcement mechanisms has been used, to our

knowledge, by DOE attorneys and program managers. However, DOE's General Counsel and EH are beginning to address these critical issues.

Reduced to its essentials, the Department has safety oversight and enforcement powers which it has not effectively used. Delays in the rulemaking process, final rules with delayed compliance schedules, minimal use of available contract enforcement mechanisms, and past use of the existing enforcement division personnel as mission-helpers rather than enforcement personnel lead to this conclusion. The Board has recently addressed some of these problems in Recommendation 94-5.

E. REVIEW DESIGN AND CONSTRUCTION OF NEW DEFENSE NUCLEAR FACILITIES TO ENSURE PUBLIC HEALTH AND SAFETY IS ADEQUATELY PROTECTED

CONGRESSIONAL MANDATE: Congress requires the Board to review the design of new DOE defense nuclear facilities before construction and to recommend such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety. 42 U.S.C. § 2286a(a)(4).

Under the Atomic Energy Act, defense nuclear facilities include any equipment or device, or component, used in the production or utilization of special nuclear material, except an "atomic weapon." Thus, the Board's mandate for design reviews extends from individual parts of those facilities to complete facilities. Most of the Board's reviews have, therefore, been directed at these systems and facilities. The Board also monitors construction activities to ensure that facilities will adequately protect the public health and safety when completed. The report of the Senate Armed Services Committee on S. 1085 stated that, with reasonable safety criteria as an objective basis for evaluation, the Board also should help the Secretary make sound modernization decisions. S. Rep. No. 232, 100th Cong. 1st Sess. 20-21 (1987).

As detailed in the Board's previous annual reports to Congress, this provision has worked as Congress intended. The fourth annual report to Congress discussed in detail the Board's systems engineering approach. In summary, the Board recognizes that design, construction, operation, and decommissioning of a facility form a complete life cycle system, and facilities must be developed with this entire system in mind. Any action related to one part of a facility at any time in its life cycle should take into consideration effects on the entire facility over all portions of the life cycle, and the relation to other facilities and their functions. This is what is meant by a systems approach. The Board applies this approach to system safety reviews of existing (already designed facilities) as well as to designs of new facilities or modifications of existing facilities.

For existing facilities, the Board analyzes the adequacy of the radiological safety design basis. For new facilities, the Board analyzes the design early in the design and

construction process. Several design and construction reviews have been completed, are underway, or are planned, as listed below.

HANFORD SITE:

Facility	Review Status
New interim storage for K-basin fuel	Ongoing
Multifunction Waste Treatment Facility (MWTF)	Ongoing
Tank Waste Remediation System (TWRS) which includes the new high level waste tanks proposal	Ongoing
Cross site transfer line	Ongoing
High level waste Vitrification Facility	Planned-Future
High level waste Pretreatment Facility	Planned-Future
101-SY Mixing Pump installation design	Complete
106-C Retrieval design	Complete
K-East Basin Electrical upgrade	Complete
Multi-canister overpack design	Complete

IDAHO NATIONAL ENGINEERING LABORATORY SITE:

Facility	Review Status
ICPP - Tank farm upgrade	Complete
ICPP - Reracking of fuel basins	Complete
RWMC - Pit 9 recovery project	Complete

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE:

Facility	Review Status
New Waste Storage Facility	Planned-Future
B776 Supercompactor and Repackage Facility	Complete
B371 Pit storage vault modifications	Ongoing

SAVANNAH RIVER SITE:

Facility	Review Status
Defense Waste Processing Facility (DWPF)	Ongoing
Replacement Tritium Facility (RTF)	Complete
In-Tank Precipitation (ITP)	Ongoing
K-reactor upgrades	Complete

LOS ALAMOS NATIONAL LABORATORY:

Facility	Review Status
Proposed modifications and upgrades to the Chemistry and Metallurgy Research building	Ongoing
Dual Axis Radiographic Hydrotest Facility	Ongoing
Modifications to the Nuclear Materials Storage Facility	Ongoing
Various radioactive waste handling and storage facilities	Ongoing

PANTEX PLANT:

Facility	Review Status
"Stage Right" project for expanding interim storage of pits in Zone 4	Complete
New weapon assembly/disassembly bays in Building 12-104A	Ongoing
New Special Nuclear Material Component Staging facility in Building 12-116	Ongoing

OAK RIDGE RESERVATION AND PADUCAH/PORTSMOUTH GASEOUS DIFFUSION PLANTS:

Facility	Review Status
Storage pads for UF_6 cylinders	Ongoing

NEVADA TEST SITE:

Facility	Review Status
Device Assembly Facility	Ongoing

SANDIA NATIONAL LABORATORY:

Facility	Review Status
Annular Core Research Reactor modifications	Ongoing

Based upon experience to date, the Board believes that its existing statutory authority for design and construction review is sufficient to effect Congressional objectives for this component of the Board's oversight function. DOE has been cooperative and responsive to review findings. For example, at Savannah River Site, systems were reclassified to safety-related at the Defense Waste Processing Facility, tritium inventory limits were adopted at the Replacement Tritium Facility, and power limits were adopted at the K-Reactor.

F. DETERMINE THAT DOE'S RESPONSE TO BOARD RECOMMENDATIONS ADEQUATELY PROTECTS PUBLIC HEALTH AND SAFETY BEFORE RESTART OF PLUTONIUM OPERATIONS AT ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

CONGRESSIONAL MANDATE: In 1992 the Senate Armed Services Committee expressed concern with the safe restart of plutonium buildings at the Rocky Flats Environmental Technology Site (Rocky Flats) in the National Defense Authorization Act for Fiscal Years 1992 and 1993. Section 3133 of that Act requires the Secretary of Energy to respond to the Board's recommendations numbered 90-2, 90-5 and 91-1 to the Board's satisfaction before plutonium operations are restarted in buildings at Rocky Flats.

The report of the Senate Armed Services Committee concerning the National Defense Authorization Act for Fiscal Years 1992 and 1993 expressed concern with the safe restart of plutonium buildings at Rocky Flats. The provisions reported by the Committee were essentially the same as enacted as section 3133.

Section 3133 requires the Secretary of Energy to respond to the Defense Nuclear Facilities Safety Board (DNFSB) recommendations numbered 90-2, 90-5 and 91-1 to the Board's satisfaction before plutonium operations are restarted in select buildings at Rocky Flats. The Board's implementation of this provision has operated as Congress expected it would. On a building-by-building basis, DOE was required to demonstrate to the Board that defense nuclear facilities at Rocky Flats were ready to safely operate. The process brought satisfactory safety results in the restart of Buildings 559 and 707, and should foster increased public confidence that those facilities will be operated safely.

G. RESTORE PUBLIC CONFIDENCE IN SAFE OPERATIONS OF DOE DEFENSE NUCLEAR FACILITIES

LEGISLATIVE HISTORY: *The report of the Senate Armed Services Committee on S. 1085 stated that the Board "must have a primary mission to identify the nature and consequences of any significant potential threats to public health and safety, to elevate such issues to the highest levels of authority, and to inform the public." S. Rep. No. 232, 100th Cong., 1st Sess. 20-21 (1987).*

Almost without exception, members of the public who have commented on the quality of the Board's technical work to upgrade safety at defense nuclear facilities have been complimentary. However, despite extensive action on the part of the Board and its staff to inform the public, the hearings conducted during 1994 in preparation for the fifth annual report revealed continued dissatisfaction on the part of some individuals and organizations with what is perceived as lack of access to Board decisionmaking processes. To put this criticism in perspective, the Board's statutory mandates regarding public access must be understood.

The Board's enabling statute prescribes how and when the Board is to notify the public of its actions and directs the Board to solicit public comments, views, or arguments and technical data. Where the Board, as a result of its deliberations, determines that action is necessary, section 312 of its enabling statute requires the Board to "make such recommendations to the Secretary of Energy with respect to Department of Energy defense nuclear facilities . . . as the Board determines are necessary to ensure adequate protection of public health and safety." 42 U.S.C. § 2286a(a)(5). Section 315 of the Board's enabling statute specifically prescribes the process by which the public is to be informed and when to comment on the recommendations. The Board's enabling legislation provided for public availability and comment on Board recommendations "after receipt by the Secretary of Energy" or by the President in appropriate cases. 42 U.S.C. §§ 2286d(a) and g(3). On July 24, 1992, the D.C. Circuit Court Appeals upheld the Board's rules implementing the Government in Sunshine Act. The Court determined that any Board "deliberations" on potential recommendations for the President or the Secretary of Energy regarding health and safety issues at DOE's defense nuclear facilities must be conducted in closed meetings pursuant to the Sunshine Act. Natural Resources Defense Council v. Defense Nuclear Facilities Safety Board, 969 F.2d 1248 (D.C. Cir. 1992), cert. denied, 113 S. Ct. 2332 (1993). The Board believes that the above required method of operation has worked well.

Parallel provisions guarantee to the public an opportunity to comment on the Secretary's response and intended implementation of the Board's recommendations. Should the Board believe that its recommendations address a "severe or imminent threat to the public safety," the public must be notified after receipt of the recommendation by the President, but there are no provisions for public comment.

Congressional reporting requirements can be viewed as another avenue Congress provided to assure that the public had a meaningful opportunity to be heard on perceived or actual health and safety threats posed by DOE's defense nuclear facilities. Moreover, Board reports assist Congress in fulfilling its oversight responsibilities.

1. Availability of Documents for Public Review and Comment

In its Annual Reports to Congress during the past five years, the Board has highlighted its efforts to inform members of the public and to incorporate their views in the process of oversight over the health and safety of defense nuclear facilities. The Board has carefully adhered to requirements for publication of recommendations and the Secretary's responses, and for receiving comments during development of its recommendations.

Specifically, after receipt by the Secretary, the Board makes its recommendations available to the public in the Department of Energy's regional public reading rooms and publishes the full text of each recommendation in the Federal Register. Each Federal Register notice also requests interested persons to submit comments, data, views, or arguments to the Board concerning the recommendations. The Board also supplements the Federal Register notice by providing personal notice of recommendations and when requested through use of a regular mailing list. Currently, congressional representatives and committees, federal and state officials and committees, public interest organizations and members of the public receive personal notice of the Board's recommendations after receipt by the Secretary of Energy.

In 1991, the Board established a public reading room and document center with electronic document search capability. Extensive technical files accumulated by the Board are available to the public for review. Many are accessible to the public over the Internet. Numerous requests for documents have been responded to on a routine basis. The Board receives numerous requests for information, with some being pursuant to the Freedom of Information Act (FOIA), and the rest as direct inquiries. The Board has responded in a timely manner to all of these requests and has been complimented, in unsolicited letters and in testimony before Congress, by private citizens and public interest groups for its prompt and competent handling of information requests and for facilitating public access to information. No Board response to a FOIA request or a request for public documents has been judicially challenged.

2. Board Regulations Promoting Availability of Information

In 1991, after public notice in the Federal Register and consultation with the Administrative Conference of the United States, the Board issued its final rules implementing the Government in the Sunshine Act (56 Fed. Reg. 9605), and its final Rules Implementing the Freedom of Information Act (56 Fed. Reg. 21,259).

3. On-Site Hearings and Discussions

During the past five years, the Board has held 38 public meetings and hearings in Washington, D.C., and in communities in which defense nuclear facilities are located.

Consistent with its public health and safety mandate, the Board has also provided opportunities for interested groups or persons, both public or private, to express their views as to DOE facilities directly to the Board members, in informal and in open discussions near the sites. These discussions have been held with federal, state, and local officials, labor leaders, DOE facility workers, and area residents for the purpose of exchanging information and assuring that the Board's review plans were known to all interested parties. Generally these briefings and meetings were noticed in the Federal Register, newspapers, and on radio stations, and notices were sent in advance to interested groups and individuals.

For example, at Hanford, Board members met with the press and interested members of the public to exchange information concerning the nuclear waste tanks. Detailed DOE and contractor briefings of the Board have included, by Board invitation, representatives of the Governors of Oregon and Washington, State and Federal Environmental Protection Agencies, and the GAO, to insure that responsible government officials were fully informed. The Board has met with the Governor of Colorado and representatives of the Governors of Tennessee, New Mexico, Texas, and Washington.

4. Activities Supporting The Fifth Annual Report

In 1994 the Board conducted nine public hearings for the sole purpose of receiving the views of the public and other interested persons regarding (1) the Board's effectiveness in meeting its objectives, (2) recommendations to continue, modify or terminate the Board's functions, and (3) recommendations on implementing modifications. All but one of these hearings were held near DOE defense nuclear facilities. The remaining hearing, at the Board's offices in Washington, D.C., was for the purpose of receiving testimony from the Secretary of Energy and senior DOE officials on these topics. Comments were received, either orally or in writing, from eighty-four individuals or groups related to the local hearings at DOE sites. Some of these comments were critical of the Board's interactions with the public. The Board was urged to place greater emphasis on working with local citizens and governments, to assign site representatives to sites where this has not yet been done, and to hold more informal meetings and hearings in the field.

IV. OPTIONS TO STRENGTHEN SAFETY OVERSIGHT AT DEFENSE NUCLEAR FACILITIES INCLUDING POSSIBLE STATUTORY CHANGES

The Board has considered and discussed a wide range of options regarding the adequacy of its current statutory authority and whether that authority should be amended or even eliminated entirely. The Board has reached the following basic conclusions, explained later in this section.

- Elimination of external safety oversight of DOE, including the Board's functions, is not advisable.

- Formal regulation (without licensing) of defense nuclear facilities, either by the Board or another agency, is not necessary nor would the perceived benefits likely justify the added costs.

- Licensing and related regulation of defense nuclear facilities is even more unnecessary and impractical, and could conflict with national defense and security functions if licensing were applied to essential facilities within the defense nuclear complex.

- The Board's current statutory authority is adequate to achieve Congress's purposes; however, the Board, building on progress made in 1994, can make better use of the range of tools available to it by statute to more fully achieve the results sought by Congress in establishing the Board.

A. ELIMINATION OF EXTERNAL OVERSIGHT

Both the Board and DOE recognize that the need for an independent oversight function is a continuing one. Moreover, safety work initially entrusted to the Board is far from complete. On December 6, 1994, the Secretary of Energy cited numerous instances where the Board's activities contributed to substantial safety improvements in the defense complex. The Secretary has also initiated efforts to enlarge external oversight by advocating OSHA inspections and surveillance of the Department's programs for assuring occupational health and safety. In the public hearings conducted throughout the country in preparation for this report, witnesses generally urged that the Board continue its work to ensure protection of public health and safety at defense nuclear facilities.

The storage, stabilization, processing, and use of radioactive materials at defense nuclear facilities will be required for many years to come. These functions will be necessary for support of the Weapons Stewardship and Stockpile Management programs and for the cleanup and decommissioning of surplus facilities. The potential hazards of dealing with radioactive materials are inherent in these activities. In the interest of worker

and public health and safety, the safe management of such materials will need to be provided as long as such programs exist.

During the Board's five-year tenure, substantial progress has been made in identifying and reducing radiological risks at some sites. Many hazardous activities lie ahead. Included among these are the stabilization of residues of the production of plutonium and safe storage by these special nuclear materials pending final disposition. Because numerous program decisions regarding the future of the complex have not yet been made, potential hazards cannot be projected accurately. However, every additional year of program delays generates increased hazards in the form of deteriorating storage containers, formation of hazardous and potentially explosive gases, and even greater obsolescence of process and monitoring equipment. These kinds of safety problems will continue and in some cases increase independently of which agency of government assumes programmatic responsibility.

In view of these continuing safety hazards, the Board does not recommend elimination of external safety oversight for defense nuclear facilities.

B. MAINTAIN THE CURRENT STRUCTURE, BUT MAKE BETTER USE OF STATUTORY TOOLS CURRENTLY AVAILABLE

Fundamental changes in the defense nuclear complex, coupled with what the Board has learned in overseeing the complex, support some changes in the way the Board has conducted its oversight activities, even if the fundamental character of the Board's enabling statute remains unaltered. As pointed out previously, the Board does not have authority to mandate timely and effective completion of corrective actions committed to by DOE in Implementation Plans for Board recommendations. The Board believes that the best means for remedying this situation is to make better use of the "action forcing" mechanisms already available to the Board.

1. Elevating Safety Issues to Highest Levels Within DOE and Better Utilization of Public Hearings on Safety Issues

As discussed previously, one of the keys to adequate development and implementation of safety recommendations by the Board is early and sustained involvement by high-level DOE officials responsible and accountable for progress. In 1995, the Board and DOE took steps toward insuring that this assignment of responsibility and accountability takes place early in the process for each recommendation.

After acceptance of DOE's Implementation Plans, Board and staff reviews, inspections, and discussions at the site in question intensify and focus on activities under the plan. When faced with inaction or inadequate progress in achieving the planned

corrective action, the Board has proposed specific remedial measures to high level DOE officials.

As stated previously, the Board's enabling statute provides for the possibility of hearings on safety matters of concern to the Board. The hearings conducted to date have been effective in monitoring DOE progress, or lack thereof, in implementing recommendations and, to some extent, in fostering accountability by DOE officials for meeting commitments in implementation plans.

The December 6, 1994 Board hearing at which the Secretary of Energy, the Under Secretary, the Assistant Secretaries, and DOE's General Counsel appeared as witnesses is an excellent case in point. In that hearing the Secretary and other high-level DOE officials made commitments to address and complete safety corrective actions in such fundamental areas as hiring of additional well-qualified technical personnel in Defense Programs, retaining critically needed and unique technical expertise of key personnel at the weapons laboratories, establishing specific safety roles and responsibilities for supervisors and managers in the defense nuclear complex, and achieving compliance with safety requirements at those facilities.

The Secretary of Energy suggested that such hearings be conducted periodically in the future to supplement the informal briefings with the Board now conducted by the Secretary on a quarterly basis. Such hearings allow the Board in public to interact with DOE leadership at the highest level, achieve consensus on how to proceed in major problem areas, and foster understanding of the Board's expectations for safety. By their very nature, such meetings deal with the highest level policy and programmatic concerns of the Board in an open public forum.

In spite of repeated site visits by the Board, and intensified technical staff scrutiny of site-specific problems, lower-level DOE officials and contractor personnel do not consistently achieve adequate progress in implementing Board recommendations. Where serious difficulties arise in correcting high priority safety matters at specific sites, more formal hearing processes may be in order. For example, it is possible that such hearings could have pinned down more effectively and expeditiously the nature of technical and administrative problems; identified areas of disagreement between the Board and DOE and contractor personnel; and ultimately prompted DOE to complete some safety improvements more quickly in implementing such fundamental Board recommendations as 90-2 (development and implementation of safety requirements), 91-6 (radiation protection), and 93-5 (waste characterization).

The Board is authorized by statute to conduct both informal and formal hearings. It has authority to subpoena witnesses, obtain testimony under oath, and secure documents that are withheld. Questioning under oath in a formal setting focuses the witness on the need to prepare for questioning and to assemble technically supportable and reliable

information before the hearing. Use of formal hearing procedures in appropriate circumstances would signal that the Board intends to use every vehicle available to it to achieve safety progress. Questioning in a public forum also creates an even greater atmosphere of accountability than informal hearings or closed briefings.

The Board intends to make greater use of hearings to increase DOE's responsiveness to Board safety initiatives and to explore roadblocks to expeditious and competent implementation of accepted recommendations. To the maximum extent possible, these hearings will be open to the public.

2. Increasing Public Involvement in Board Activities

Since its inception in October 1989, the Board has adhered to a policy of seeking out and meeting with any person or organization having expressed concerns about health and safety at the DOE's defense nuclear facilities. In implementing that policy, Board members have traveled to defense nuclear sites where they have met with contractors, DOE representatives, State and local elected and appointed officials, members of the public, and representatives of labor unions and public interest groups.

The Board fully supports the U.S. Attorney General's recent direction that the Freedom of Information Act clearly articulates a presumption and preference for government agencies to make information available to the public. The Board also has realized important benefits from informing the public and obtaining its input on health and safety issues. For example, the Board's public meeting to obtain information regarding Los Alamos National Laboratory's failure to comply with the Secretary's direction for full compliance with DOE safety orders demonstrated that public airing of such matters enhances Board efforts to protect public health and safety. The Board intends to continue its policy of public involvement, and increase its use of meaningful ways for involvement in the future. The Board intends to pursue the following:

- Increase the use of appropriate Board briefings, unrelated to development of formal safety recommendations, to inform the public;

- Making the Board and/or technical staff accessible to DOE citizen advisory committees established at various sites;

- Establishing site representative positions, similar to those at the Pantex Plant and the Hanford Reservation, at other defense nuclear facilities, particularly Rocky Flats and Savannah River Site;

- Continuing its established record of being a leader in the prompt and efficient disseminator of safety documentation; and

- Increasing the use of public hearings to question DOE witnesses on progress in implementing Board recommendations.

3. Communication With Congress on Safety Matters

Congress is another vehicle for bringing more accountability to the DOE safety programs. In addition to its annual reports to Congress, the Board may communicate significant safety issues and impediments to progress at sites during Congressional hearings. For example, the Board's Chairman testified to several Congressional subcommittees regarding the need for excepted service authority at DOE. That authority will help the Department to recruit and promote better-qualified technical staff required for more effectual performance in assuring safety at defense nuclear facilities. Congress passed an amendment to the Atomic Energy Act in 1994 giving DOE excepted appointment authority, which became effective October 5, 1994.

C. NEED FOR STATUTORY CHANGES

The Board has discussed a number of possible changes to its organic statute (short of formal regulation and licensing) to address the difficulties in effectuating DOE responsiveness to the Board, which have been brought to the attention of Congress in prior annual reports. As to each potential change, the Board concludes at this time that the problems can be best addressed by more vigorous use of existing statutory authority. The Board does not foreclose seeking statutory changes in the future should the need clearly arise. Possible changes considered include:

1. Shortening the Period Allowed for DOE Responses to Board Recommendations and for Development of Implementation Plans

A review of DOE's responses to the Board's recommendations during the past five years demonstrates that DOE almost always requests a statutorily-permitted 45-day time extension to respond, resulting in a total time of ninety days. Similarly, the Department now uniformly takes an authorized extension of forty-five days beyond the original ninety days to prepare an implementation plan. With these added together, DOE regularly takes a total of 225 days from receipt of the recommendation to issue an implementation plan. Many plans need revision before they are adequate, a process, in whole or in part, which can take years to accomplish. Although the statute allows actual implementation even before a plan is submitted, that is not the norm.

The Board is not convinced that altering these deadlines by statute would materially improve the situation. The Board recognizes that some of the issues raised in its recommendations are much more complex than others. In such instances, longer periods are justified because more time is needed to develop an adequate response and plan. The goal, after all, is not receipt of any document called an "implementation plan"

within the statutory deadlines, but the timely receipt of an adequate implementation plan, and the diligent carrying out of that plan under a management arrangement that does not diffuse responsibility for its execution. These objectives, the Board observes, are more likely to be met when top-level DOE management (including the Secretary) take personal responsibility for directing the necessary work to write and execute a plan. To ensure that DOE management at the highest level assumes this responsibility for existing and future recommendations, the Board believes that regular public meetings with the Secretary and the heads of major program offices are effective. As discussed in the previous section, public hearings may also be used to determine why DOE's implementation of recommendations has faltered either as to schedule or quality of work.

2. Startup Approval and Stop Work Authority

The Board considered two options in regard to startup approval. A first option is to require the Board to determine whether or not public health and safety are adequately protected before a defense nuclear facility is started or resumes operation. This finding is analogous to the Board's certifying that a facility is safe, and it resembles licensing.

Second, the Board could be authorized to determine whether the DOE's responses to recommendations regarding the facility in question adequately protect public health and safety. This is a direct parallel to the Rocky Flats provision, which presents a complication when applied to all defense nuclear facilities. Section 3133 of Pub. L. 102-190, 105 Stat. 1574-75, referred to existing Board recommendations applicable to Rocky Flats, and to DOE responses, as the measuring stick for whether or not a facility was ready to operate. To adhere to the Rocky Flats model, Congress would have to decide which Board recommendations -- or other measures of safety -- should be used in determining whether a facility was prepared to operate safely. For example, Congress could direct the Board to measure readiness against DOE's own Orders and other requirements governing operational readiness.

Congress could confer on the Board explicit authority to stop work at defense nuclear facilities, based on safety considerations, without resort to the recommendation process or the "imminent or severe threat" provisions of the statute. Such authority would parallel, for example, NRC's authority to halt operation of a nuclear power plant due to violations (or potential violations) of safety parameters. Stop work orders could be limited to a very specific activity at a facility (for example, proceeding to the next step of a process) or could be broad enough to halt operation of an entire facility pending resolution of safety questions (for example, structural adequacy).

These startup or stop work authorities would, of course, be subject to override by the President if they interfered with national security. The Board does not believe additional statutory authority as outlined above is necessary at this time. Over the past five years, there have been several instances in which the Board has made it clear to DOE

that operation of a certain defense nuclear facility was contrary to safety principles. Examples include the K-Reactor and HB-Line at the Savannah River Site, Building 559 at Rocky Flats, and the Fernald Environmental Restoration Project. Each of these facilities was the subject of a Board recommendation regarding conditions necessary for startup or resumption of prior activities. None of the facilities went into operation until the conditions laid out by the Board were satisfied.

The Board has observed no instance where DOE management has deliberately operated a defense nuclear facility in an unsafe condition warranting an immediate shutdown order by the Board. In the latter part of 1994, for example, DOE took prompt action to halt operations at the Oak Ridge Reservation Y-12 facility after the Board's technical staff pointed out deficiencies in criticality procedures. These deficiencies led the Board to issue Recommendation 94-4 on September 30, 1994, but DOE's curtailment of Y-12 operations and the commencement of corrective actions preceded even the issuance of the Board's recommendation. Similarly, in 1992 the Board's staff identified plutonium pits stored in severely substandard conditions in Building 991 at the Rocky Flats Plant. Several pit storage containers were located in standing water and others were exposed to water in-leakage. In response to expressed Board concerns, DOE's Office of Defense Programs promptly acted to move the pits to a more satisfactory area for storage and subsequently developed plans for complete revision of pit storage practices at Rocky Flats. Provided DOE continues a policy of prompt and adequate response when safety deficiencies are discovered, the Board does not need additional authority to order immediate actions or to halt operations.

The Board is satisfied that, should a situation arise where startup or continued operation of a facility might be contemplated by DOE despite serious safety problems, or result in imminent or severe risk, a recommendation to the Secretary or to the President would result in prompt action.

3. Safety Standards: Board Concurrence Authority or Assumption of Responsibility for Establishing Standards

The Board has reported to Congress in each of its previous four annual reports on the progress made toward the improvement of DOE safety standards, including rules, orders, and other requirements. While substantial progress has been made since 1990, implementation delays occur and some DOE standards need improvement. The Board considered two possible statutory changes which could impact these problems:

- a statutory requirement that DOE obtain formal Board concurrence for standards affecting nuclear safety, or

- a statutory provision assigning the Board responsibility and authority for establishing safety orders, rules, and other requirements with which DOE and its contractors must comply.

As to the first of these, the Board believes it has been able to significantly impact the content of proposed DOE Orders without any need for formal concurrence authority. Through interactions at the staff level and at the Board-DOE management level (if necessary), many proposed DOE safety Orders and generic standards have been modified to reflect Board Member views. Standards reviewed and commented upon by the Board and its staff include a series of revised nuclear safety Orders in the DOE Order 5480.20 series; guidance on implementing those orders; radiation protection requirements and guidance; seismic criteria; and draft technical standards on safety analysis reports, accident analysis criteria, implementation of safety regulations, and exemptions from regulations. The Board is currently reviewing a number of proposed DOE technical standards, including Orders, rules, site-specific S/RIDs, and other safety requirements.

DOE's increasing use of public rulemaking to develop and issue nuclear safety requirements does not impair the Board's ability to ensure the adequacy of these requirements. The Board can comment during any phase of the rulemaking, can use its reporting authority to obtain supporting data from DOE, and can hold public hearings to obtain testimony from DOE and others. Informal meetings between the Board's technical staff and DOE personnel have also proved an effective comment mechanism.

For the most part, the Board has found DOE receptive to comments from the Board on proposed standards and requirements. If DOE intended to issue a final standard the Board believed inadequately protected public health and safety, the Board would not hesitate to use its existing statutory powers to ensure that the deficiencies are corrected prior to implementation of the standard. To date, the Board has no reason to conclude that its current ability to influence the content of standards is inadequate.

Actual transfer of safety standards development to the Board from DOE would represent a major change in the Board, from an action-forcing oversight agency to a regulatory agency. Generally, enforcement power must be transferred along with standards-setting power. To assume this task, the Board would have to acquire significant additional staff and funding. Most importantly, standards cannot be developed in a vacuum. DOE's standards development program relies significantly upon technical expertise in the laboratories, field offices, and other organizations which the Board would have to tap or duplicate.

The Board concludes that standard-setting power is not needed at present because the Board has been able, chiefly through recommendations, to spur DOE to develop or revise safety standards when necessary. Several of the Board's early recommendations, including 90-2 and 91-1, aimed squarely at this target by seeking broad changes in the

way DOE developed and used standards to enhance safety at defense nuclear facilities. Other Board recommendations dealt with more specific standards topics.

- Recommendation 91-6 required among other things that DOE compare its radiation protection standards to commercial industry standards.

- Recommendation 92-6 sought DOE development of standards to be used for conducting operational readiness reviews (ORRs).

- Recommendation 93-1 urged DOE to compare safety standards at weapons facilities with those used at production and processing facilities.

- Recommendation 94-2 addressed the need for DOE's standards on the disposal of low level radioactive defense waste.

- Recommendation 94-5 stressed the importance of DOE's properly integrating the issuance and implementation of nuclear safety rules, orders, and other requirements.

Each of these recommendations was accepted by DOE. While implementation has not always been timely and efficient, significant progress has been achieved.

The Board's efforts on the standards front have resulted in substantial improvement in DOE's standards structure over the past five years. Wholesale transfer of standards development might slow down the upgrade process. Accordingly, the Board does not favor transfer of safety standards development outside of DOE. The Board will continue to review DOE standards and to use its existing authority to improve DOE's standards program.

4. Imposition of Implementation Plan Commitments As Contract Terms

With few exceptions, the mandates in the Board's enabling statute are directed toward DOE, not its contractors. The contractors, however, are instrumental in the development of implementation plans and are vital to the completion of those plans. The Board's review of existing contracts and requests for proposal often reveals that actions related to implementation of the Board's recommendations and DOE's safety Orders are not contractual requirements. A statutory change could require DOE to insert appropriate terms regarding implementation of Board recommendations and DOE Orders into contracts.

In cases where the Board has specifically brought this issue to the attention of DOE management, changes have resulted. In Recommendation 94-5, issued at the end of 1994, the Board requested that DOE undertake a thorough review of the means by

which nuclear safety requirements are imposed on contractors. DOE has begun addressing some of these issues. During 1995, the Board will be reviewing DOE's implementation plan for Recommendation 94-5 and will continue to scrutinize DOE contracts and requests for proposals to assure that nuclear safety requirements are incorporated.

5. Board Authority to Compel DOE and Contractor Action to Implement Board Recommendations

A statutory change could authorize the Board to issue compliance orders and to take enforcement actions against DOE and its contractors when commitments made in implementation plans addressing Board recommendations are not fulfilled. Compliance orders are an appropriate tool--used by many Federal regulatory agencies--to mandate specific corrective actions, suspend certain activities, or carry out programmatic commitments. Board orders directed to DOE, if authorized by statute, would not give rise to procedural complexities such as the need to meet Administrative Procedure Act hearing requirements. Board orders to contractors would need to be accompanied, for due process reasons, by the offer of an administrative hearing to the contractor if factual or other matters are in dispute. This would in effect invoke the Board as a quasi-regulatory agency, which Congress, in establishing the Board, rejected. This option also might create an incentive for DOE to submit weak, non-specific implementation plans incorporating lengthy schedules inconsistent with the urgency of safety problems.

D. MAJOR REORIENTATIONS OR MODIFICATIONS IN BOARD STATUTORY AUTHORIZATION

1. Introduction: Determining the Extent of DOE Self-Regulation

The Department of Energy's nuclear programs are authorized by the Atomic Energy Act of 1954, as amended. This statute originally assigned a wide range of responsibilities, both civilian and military, to the Atomic Energy Commission. A licensing program was established as a means of fostering commercial uses of radioactive materials such as atomic power. Nuclear weapons applications and the production of weapons materials remained entirely under Federal control. This centralized control of military applications was maintained as AEC functions were transferred first to the Energy Research and Development Administration (ERDA) and then to the Department of Energy. The NRC was created to license and regulate commercial use of radioactive materials.

Throughout the period of the '50s and '60s, the preemptive nature of the Atomic Energy Act ensured tight Federal control of both civilian and military nuclear activities. Beginning with passage of the National Environmental Policy Act (NEPA) in 1969, however, the preemptive domain of the Atomic Energy Act began to shrink. In the decades since the passage of NEPA, DOE autonomy in the field of nuclear operations has

gradually been eroded by the passage of statutes such as environmental laws, the Federal Advisory Committee Act, and by Presidential orders, judicial decisions, and stronger assertion of State jurisdiction. Today, many defense nuclear activities of DOE are tightly constrained by law and the regulations of other agencies. But one element of the AEA continues to be of paramount importance -- "the common defense and security" of the nation.

During the past year, there has been much discussion of the extent to which DOE is self-regulating. "Self-regulating" means the extent to which the Department's programs and actions are not constrained by Federal and State laws other than the Atomic Energy Act. The premise that DOE today is self-regulating is inaccurate. It is a carryover from the early days of the Manhattan Project and AEC. Defense nuclear activities were exempt from licensing under the Atomic Energy Act and remain so today. However, exemption from licensing is not synonymous with exemption from external oversight. In fact, DOE is subject today to very substantial external regulation and oversight. This results not only from oversight of nuclear safety by the Board, but also from the Department of Transportation and the Environmental Protection Agency. The most notable exception to external oversight is in the occupational safety and health area. The extent of existing regulation is graphically displayed in Figure 1 (presented in Executive Summary) and discussed in detail in the material that follows.

The measure of DOE self-regulation is fully understood by considering three types of constraint on action.

- LEGAL CONSTRAINTS: statutes, judicial decisions, and Executive orders which the Department must follow without discretion.

- PRACTICAL CONSTRAINTS: factors which effectively restrict the Department's freedom of action, such as agreements with States and other Federal agencies, implementation plans for Defense Nuclear Facilities Safety Board recommendations, and budgetary restrictions.

- POLICY CONSTRAINTS: reflected in overall Administration policy objectives, public perception, and foreign policy interests.

These constraints apply to all aspects of DOE nuclear operations, from procurement to waste disposal. The interest here is to determine what constraints apply to the radiological component of the Department's health, safety, and environmental protection programs for defense nuclear facilities and activities. These programs can be broken down into the following seven categories:

- NUCLEAR SAFETY[14] for activities not within the purview of either DNFSB or NRC,
- NUCLEAR SAFETY for defense activities within the purview of DNFSB,
- NUCLEAR SAFETY for activities licensed by NRC,
- INDUSTRIAL SAFETY AND HEALTH at all defense nuclear facilities,
- POLLUTION CONTROL at all defense nuclear facilities, and
- SAFETY AND ENVIRONMENTAL PROTECTION at cleanup and waste disposal sites.

The level of self-regulation and external oversight of DOE's nuclear safety program varies from site to site and may actually vary within a given site. Some DOE non-defense nuclear facilities are neither licensed nor within Board jurisdiction. Facilities within Board jurisdiction are subject to inspection and oversight. Many changes in the DOE nuclear safety program at these facilities have resulted directly from Board recommendations and on-site reviews. Nonetheless, DOE retains operational freedom of action at these facilities and cannot be ordered by the Board to take or not to take specific actions. DOE facilities licensed by the Nuclear Regulatory Commission, e.g., Yucca Mountain high level nuclear waste repository, will be regulated by NRC according to its regulations and standards, some of which are based on EPA regulations and standards, e.g., 40 C.F.R. Part 191. Similarly, EPA set standards for radiation protection, under authority of the AEA, Executive Order 10,831, and Reorganization Plan No. 3 of 1970. These standards, when approved by the President, are to be used as guidance by other agencies, e.g., DOE, NRC, when preparing their own detailed procedures on radiation protection.

Industrial health and safety programs at DOE facilities are required by Executive Order to meet OSHA regulatory requirements.[15] OSHA does not have statutory inspection and enforcement power at defense nuclear facilities; however, the Secretary of Energy has invited OSHA to begin inspection of DOE facilities. As of this writing,

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[14] For purposes of this discussion, nuclear safety is meant to encompass those features of design, construction, operation, and decommissioning of nuclear facilities that are intended to prevent or mitigate accidents with potential for radiological consequences to workers or the public.

[15] Exec. Order No. 12,196, 45 Fed. Reg. 12,769 (1980), reprinted as amended in 5 U.S.C. § 7902.

OSHA inspections have not been routinely conducted at defense nuclear facilities. Board recommendations often have touched on worker safety issues when related in some way to radiological health and safety, e.g. health physics.

In the area of environmental impacts, DOE's freedom of action is already tightly constrained by Federal law. NEPA requires that environmental impacts of proposed major actions be fully analyzed before the action is taken.[16] This statute, coupled with many broad judicial interpretations of its scope and requirements, has already strongly affected the Department's freedom of action and schedule for construction of new facilities, remediation of hazardous sites, and reconfiguration of the defense nuclear complex. The Clean Air Act controls permissible levels of airborne radioactive emissions.[17] The Clean Water Act applies to some radioactive pollutants, but not those regulated under the Atomic Energy Act.[18] These levels are established by the Environmental Protection Agency and have been internalized by DOE in its orders. The Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) heavily impact the storage and disposal of hazardous wastes and the cleanup of environmentally-damaged sites.

The Department retains authority under the Atomic Energy Act over handling and storage of radioactive materials such as fissionable uranium and plutonium when not mixed with other hazardous wastes; mixed radioactive and hazardous wastes, on the other hand, are within the scope of RCRA.[19] Thus, storage of plutonium metal removed from

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[16] 42 U.S.C. § 4332(2)(C).

[17] The Clean Air Act, 42 U.S.C. § 7401 et seq., applies expressly to "source, special nuclear and byproduct" material, 42 U.S.C. § 7422(a), and applies to federal facilities, 42 U.S.C. § 7418.

[18] Although the Clean Water Act (Federal Water Pollution Control Act), 33 U.S.C. § 1251 et seq., applies expressly to "radioactive materials," 33 U.S.C. § 1362(6), and pollutants from federal facilities, 33 U.S.C. § 1323, the U.S. Supreme Court has found that source, special nuclear, and byproduct materials regulated under the AEA are excluded from this definition; however, some radioactive materials remain subject to the Act. See Train v. Colorado Public Interest Research Group, 426 U.S. 1 (1976).

[19] EPA included regulation of mixed waste within RCRA in 1986. See 51 Fed. Reg. 24,504; State of New Mexico v. Watkins, 969 F.2d 1122 (D.C. Cir. 1992). RCRA was applied to federal facilities by the Federal Facility Compliance Act of 1992, Pub. L. No. 102-386, 106 Stat. 1505 (1992).

warheads is not a regulated activity,[20] though it is clearly within Board jurisdiction. Transportation of defense-generated radioactive materials, excluded from Board jurisdiction, is regulated by the Department of Transportation and by individual States. Under CERCLA, EPA oversees cleanup of DOE's facilities based on interagency agreements which can include states as parties.

In 1982, Congress mandated that long-term disposal of high-level radioactive waste in a geologic repository would be the subject of licensing by the Nuclear Regulatory Commission. DOE's uranium gaseous diffusion plants are to be certified by NRC under published standards, but not licensed under the Atomic Energy Act and the Administrative Procedure Act. 42 U.S.C. § 2297f. Later in this report, the feasibility and policy implications of extending the licensing concept to other DOE nuclear sites and activities are explored. Other DOE facilities and activities have been subject to regulatory oversight on a case-by-case basis. For example, under the WIPP Land Withdrawal Act, EPA must certify that the WIPP can meet EPA's high level and transuranic waste disposal standards before the WIPP can be used to dispose of waste. The Uranium Mill Tailings Radiation Control Act directs DOE to conduct remedial actions to EPA's standards governing cleanup and disposal of mill tailings.

It should be noted that not all hazardous activities undertaken either by government or the private sector are subject to oversight and regulation. Nor does lack of external oversight imply lack of safety or an inability to achieve safety without oversight. Adding one layer of government on top of another is expensive and potentially regressive if the "overseen" agency no longer takes full responsibility for its work. Additional regulation of DOE activities should be considered only where it is clear that safety and environmental goals cannot be reached by improvements from within DOE.

A visual representation may assist in understanding the relationship between constraints on DOE's authority and areas of DOE's safety and environmental responsibility. In each of Charts A - F that follow, legal, practical and policy constraints are applied to each of the seven safety and environmental functions listed above. Two additional charts identify candidate agencies for additional oversight responsibilities and statutory amendments needed to effectuate such oversight.

[20] OSHA guidance applies to worker handling.

A. Nuclear Safety for DOE Activities Outside Board and NRC Jurisdiction

Legal Constraints	Practical Constraints	Policy Constraints	Summary
The Atomic Energy Act of 1954, as amended, requires the Secretary to establish rules, orders and other standards "to protect health or to minimize danger to life or property . . . ." 42 U.S.C. § 2201(b). Only the Courts and Congress can decide whether DOE is carrying out this AEA mandate.	Nuclear safety standards resulting from compliance with NRC requirements for licensed facilities (if any) and Board recommendations for defense nuclear facilities will have some impact on facilities and activities not explicitly covered. To avoid numerous styles of operation and multiple sets of requirements, this subset of nuclear facilities will probably be "boxed in" vis-a-vis nuclear safety issues by regulated facility requirements.	Safety problems at any DOE facility, when generally known, result in adverse publicity and Congressional interest. By the time problems grow to this magnitude (e.g., a release of radioactive material), however, solutions are costly and the harm may already have been done. Regulation is intended to help prevent serious safety deficiencies.	DOE remains self-regulating for nuclear facilities such as research reactors not under Board jurisdiction. Even if these facilities remain immune from external oversight, they will likely be forced to meet nuclear safety requirements emanating from NRC regulations and Board recommendations. Subjecting this class to some form of external safety oversight could be accomplished with straight-forward amendments to the AEA. The nuclear propulsion program operated by the Office of Naval Reactors is not subject to external oversight, but voluntarily utilizes the overview of the Advisory Committee on Reactor Safeguards.

B. Nuclear Safety for DOE Defense Activities Within the Board's Jurisdiction

Legal Constraints	Practical Constraints	Policy Constraints	Summary
The Atomic Energy Act of 1954, as amended, requires the Secretary to establish rules, orders and other standards "to protect health or to minimize danger to life or property . . . ." 42 U.S.C. § 2201(b).	Recommendations of the Board on nuclear safety, once accepted by the Secretary, are a strong commitment to action, though the Board does not have direct enforcement power. Federal radiation protection guidance applies to protection of the general public and workers: e.g., guidance approved by the President in 52 Fed. Reg. 2822 (1987) and new guidance proposed by EPA in 59 Fed. Reg. 66,414 (1994). This guidance provides a framework for agencies to meet International Commission on Radiation Protection (ICRP) and National Commission on Radiation Protection (NCRP) standards.	The unstated policy of two Administrations and Secretaries has been to accept and implement Board recommendations. Policy considerations for the previous category also apply.	DOE's nuclear safety policies and requirements are reviewed by the Board and subject to Board recommendations.

C. Nuclear Safety for DOE Activities Licensed by the NRC

Legal Constraints	Practical Constraints	Policy Constraints	Summary
The Atomic Energy Act of 1954, as amended, requires both the Nuclear Regulatory Commission and the Secretary to establish rules, orders and other standards "to protect health or to minimize danger to life or property . . . ." 42 U.S.C. § 2201(b). The Nuclear Waste Policy Act of 1982, 42 U.S.C. § 10101 et seq., mandates NRC licensing subject to EPA standards of a high-level waste repository to be built by DOE. NRC, EPA and DOE have issued regulations partially implementing this Act. Privatized gaseous diffusion plants to be certified by NRC according to published criteria. 42 U.S.C. § 2297f.	States can influence Federal policy through Congress, the courts, and Federal laws permitting a State role in permits and licenses. Yucca Mountain is an obvious example.	Policy strongly influences the high-level waste program.	NRC licensing reduces DOE self-regulation of nuclear safety to that of any other NRC licensee: DOE is responsible for safety but NRC is the judge of when adequate protection is achieved. To date, NRC has not licensed a DOE-owned or operated facility. Licensing of the repository is far off in the future.

D. Industrial Health and Safety

Legal Constraints	Practical Constraints	Policy Constraints	Summary
Section 19 of the Occupational Safety and Health Act, 29 U.S.C. § 668, requires Federal agencies to establish worker protection regulations consistent with those of OSHA. Executive Order 12,196 requires all Federal agencies to comply with OSHA worker protection standards unless the Secretary of Labor approves alternate standards.	At defense nuclear facilities, Board can and has issued recommendations affecting worker safety. State worker protection laws and policies might have some impact on local DOE sites even if not legally applicable. The Secretary of Energy has invited OSHA inspection of DOE facilities. OSHA has indicated that it lacks adequate resources to assume such responsibility.	None.	The Executive Order makes clear that DOE must meet OSHA standards; what is not yet determined is whether DOE will be permitted to assess its own compliance or will be inspected by an external body (OSHA, the Board, etc.). Congress could also provide each State with some worker safety jurisdiction.

E. Pollution Control

Legal Constraints	Practical Constraints	Policy Constraints	Summary
Clean Air Act, 42 U.S.C. § 7401 et seq.; radioactive pollutants specifically covered in Section 7422. Clean Water Act, 33 U.S.C. § 1251 et seq.; some radioactive material covered in Section 1362(6). National Environmental Policy Act, 42 U.S.C. § 4321 et seq. (impact statements and assessments). Marine Protection, Research, and Sanctuaries Act of 1972, 33 U.S.C. § 1401 et seq.; radioactive materials, Section 1402(c). Hazardous Materials Transportation Act of 1975, as amended, 49 U.S.C. § 5101 et seq.; radioactive materials, Section 5103.	1) Agreements with States. 2) Board recommendations bearing on environmental protection from spills, releases, etc. 3) State environmental laws and regulations/permits.	Administration policy can strongly influence the level of effort and funding of environmental protection efforts, though the basic statutory requirements are unlikely to be relaxed.	DOE does not have much maneuvering room in this field, except as to onsite inspections of its facilities. DOE's own requirements perforce follow the already-applicable statutes and regulations of EPA.

F. Safety and Environmental Protection at Cleanup and Waste Disposal Sites

Legal Constraints	Practical Constraints	Policy Constraints	Summary
NEPA (cited above) RCRA, 42 U.S.C. § 6901 et seq.; excludes source, special nuclear or byproduct material as defined in the Atomic Energy Act. [42 U.S.C. § 6903(27)] Courts have held that it does cover mixed radioactive/toxic waste. CERCLA, 42 U.S.C. § 9601 et seq.; excludes releases of source, special nuclear, or byproduct material in compliance with Atomic Energy Act licenses. [42 U.S.C. § 9601(10)(K)] Nuclear Waste Policy Act of 1982, 42 U.S.C. § 10101 et seq. (long-term disposal of high-level waste, UF_6). Low Level Radioactive Waste Policy Act, as amended, 42 U.S.C. § 2021b et seq.	Same as previous page: 1) Agreements with States, such as the Tripartite Agreement for Hanford. 2) Board recommendations bearing on environmental protection from spills, releases, etc. 3) State environmental laws and regulations/permits.	Same as previous page: Administration policy and Congressional attitudes have strong influence on pace of programs, funding.	DOE has little discretion left in this area except as to non-mixed radioactive materials such as uranium and plutonium metal and compounds thereof. DOE requirements in orders, rules and operating or ERMC contracts mandate compliance with environmental statutes, EPA regs, and State requirements as applicable. Defense waste stored at the Waste Isolation Pilot Plant (WIPP) falls within EPA RCRA jurisdiction if mixed waste; the Board also has jurisdiction over WIPP (see discussion in the Board's first Annual Report to Congress at 44-45).

2. Overview of the Board's Position on Need for Full Regulatory or Licensing Authority

Formal regulation of defense nuclear facilities, without licensing, is an option for expanding the regulatory tools available to the Board. This option could be matched with virtually any option for expanding, contracting, or maintaining current Board jurisdiction. It is an intermediate option between the Board's current statutory authority and the alternative of formal regulation with licensing authority, which is analyzed in the next section. The Board's position relative to the need for formal regulation or licensing of DOE defense nuclear facilities may be summarized by referring to Figure 2 (presented in Executive Summary), which divides the defense nuclear complex into four parts. Part I of Figure 2 displays the traditional facilities and functions of the defense nuclear complex--weapons assembly, disassembly, and testings; weapons design at national laboratories; and other production facilities. The legislative history relative to the establishment of the Board clearly indicates Congressional interest in continuing to exempt defense nuclear facilities from licensing. Licensing provides the possibility and authority for a licensing agency to deny permission to construct, operate, or continue to operate. Congress chose to reserve decisions affecting national defense and security for the President and Congress. Congress saw, however, the need to subject nuclear safety at DOE's defense nuclear facilities to an external scrutiny. Congress authorized the Board to oversee the radiological health and safety aspects of practices and facilities which were not previously subject to external regulation, including the design, construction, operation, and decommissioning of defense nuclear facilities. At a minimum, in the Board's view, those facilities of the defense nuclear complex deemed necessary for defense and security should continue to be constructed and operated subject to external oversight, but without the encumbrances of a formal licensing process.

Part II of Figure 2 displays facilities and functions related to the decontamination and decommissioning of facilities no longer needed for production, and those necessary for the treatment, storage, and handling of nuclear waste. The rationale for exempting facilities no longer needed for national security purposes is somewhat different from the case made for continuing to exempt defense nuclear facilities required for national security and defense from licensing.

The Board is currently authorized to provide external oversight of defense nuclear facilities and activities from design through decommissioning. The Board's oversight duties appear to overlap with EPA's responsibilities when certain facilities are combined with associated contaminated land areas to define "operable units" for cleanup under CERCLA provisions. EPA and the states are also involved in new facilities being constructed or operated to treat, stabilize, and safely store mixed radioactive waste and residuals of the production of special nuclear materials.

There appears to be a perception in some circles that a different form of external regulation of these activities, such as NRC licensing, would enhance public acceptability of DOE actions. The more fundamental considerations should be whether the cost of alternative external oversight and regulations would exceed the benefits. Given the extensive external regulation and oversight already accorded facilities that fall under Part II, it makes little sense to add yet another agency to those that DOE must deal with for these facilities.

Ideally, one agency should retain the lead for external oversight or regulation of these nuclear facilities from start to finish; that is, from design through final disposition. The object should be to maximize safety and minimize the cost of oversight and regulation, not complicate DOE's compliance efforts by fragmentation of requirements imposed by multi-agencies.

Defense nuclear facilities and activities that are being remediated pursuant to environmental restoration laws are displayed in Part III of Figure 2. Remedial actions come under the purview of the CERCLA, EPA, and states. In some cases, DOE will also have made commitments to the Board regarding public health and safety aspects relevant to remedial actions at defense nuclear facilities. The Board in such cases can and should assist EPA by insuring that such commitments are duly considered prior to completion of the remedial action plan. In effect, the Board should strive to assure an ordered transition of the oversight function.

Part IV of Figure 2 clearly illustrates that final repositories for nuclear waste are governed by existing statute and regulation. Thus, there is no need for additional regulatory authority.

3. Advantages and Disadvantages of Conferral of Regulatory Authority

While the following discussion focuses on the Board as a possible regulator or licensing agent, the advantages and disadvantages generally apply regardless of the agency given regulatory or licensing authority. Regulatory authority is the ability, granted by statute, to control, direct, or restrict another's action by agency rule or other legally enforceable order, specification, or requirement. Licensing authority is a particular type of regulatory activity which empowers the licensing agency to forbid certain actions until, and unless, a license is granted to the licensed entity after demonstrating its ability to conform to certain standards. Thus, granting the Board formal regulatory authority without licensing would mean allowing the Board to control, direct, or restrict DOE actions without use of a license or permit.

The major advantage of conversion to regulation of defense nuclear facilities is that it would provide the Board with greater action-forcing authority and thereby enable it to effect change more expeditiously. Regulatory bodies may mandate action by the

regulated entity. External regulation is perceived by some as a means for engendering greater public acceptance of activities at defense nuclear sites.

Several disadvantages counterbalance the advantages of regulation in this case. First, regulation of defense nuclear facilities is not easily reconciled with national security imperatives. Regulatory or licensing programs must make allowances for national security and defense priorities, or those programs could be detrimental to rapid responses necessary to counter international threats. Second, the additional administrative burdens and costs of running a regulatory agency need to be weighed against the added safety assurance that might be achieved. The judgment of the Board is that the added benefit in this instance would not justify the cost. The Board is convinced that enhanced use of its oversight tools will achieve many of the safety gains attributed to regulation or licensing without enormous increase in cost. Third, substantial safety gains made by five years of the Board's recommendation process could be lost if such a conversion takes place and Congress does not mandate a process for preserving the progress already made. The regulatory body would have to either adopt or develop its own regulations and build independent compliance and enforcement programs, requiring years of effort.

The power to impose and enforce requirements is central to regulatory authority as distinguished from the current, or enhanced, Board oversight capability which relies upon an advisory/recommendation arrangement. Many regulatory agencies establish mandatory standards, rights, and duties which the regulated entity (individual, group, firm, industry, etc.) must comply with. The regulator enforces compliance through the imposition of penalties (civil and criminal) or other remedies (e.g., injunctions, decrees, restraining orders, and writs of mandamus). Authority to enforce DOE-promulgated rules under the Price-Anderson Act amendments could be transferred to the Board or another agency. This would address the situation where DOE enforces safety requirements at contractor-operated facilities the Department owns and is responsible for. However, it is imprudent to split standard-setting functions from enforcement. Any organization charged with setting standards for its own operation will have little incentive for imposing restrictive safety requirements if others have the independent authority to enforce those standards once adopted.

The Board currently cannot set safety standards; it can only propose them to DOE. It has only informal "action forcing" powers--the authority to make recommendations and elevate the matter to the President and Congress if DOE's response does not meet with the Board's approbation. The option of regulatory authority without licensing would augment the Board's enforcement authority by allowing it to perform one or more of the following functions: to require safety standards, not just recommend them; to mandate corrective actions for safety problems identified during Board oversight activities; to impose requirements which correct long-standing personnel deficiencies; and to enjoin, restrain, or penalize any violations of the standards. One way to assign the Board penalty powers would be to transfer from DOE the authority under the Price-Anderson Act to

impose penalties on DOE contractors for violations of safety requirements that have gone through rulemaking.

Of regulatory functions, it is the ability to promulgate and then enforce standards--through stop work orders, fines, penalties, or enforceable orders--that is most distinctive of formal regulation. Although the Board would be authorized to impose standards on DOE, and to seek enforcement actions against the Department or its contractors for violation of the standards, under this option the Board would not have the authority to require DOE to obtain a license or permit prior to operating certain facilities or performing certain operations. The Board could use its regulatory powers, however, to condition operation on operational readiness--demonstrated compliance with applicable rules, Orders, and other safety requirements. The option of granting regulatory authority without licensing could also subsume some of the measures, previously analyzed, which would strengthen and improve the Board's enabling statute; measures that fall short of "formal regulation."

a. Possible Health and Safety Advantages of the Regulatory Option

In addition to the major advantages and disadvantages stated at the outset, a variety of lesser pros and cons mark the option of formal regulation without licensing versus the Board's current authority. Although not a direct health and safety advantage, regulation (and licensing) would provide interested members of the public with perceived enhanced opportunity to participate in the safety process.

Among the possible health and safety advantages of the option are the following: First of all, authority to set, and not merely to recommend, standards would allow the Board to establish a set of safety requirements. The Board would not necessarily need to prepare the requirements, but could enforce or impose existing government, industry, or consensus standards. Thus, this option would strengthen and augment an explicit Board function--perhaps the most important one--in a straightforward way.

Second, after the initial lapse needed for startup and development of the rules, DOE's implementation of formal Board actions would be accelerated if DOE and its contractors faced enforcement actions, in the form of fines, penalties, or court orders. In other words, to the degree DOE management would find enforcement actions less palatable than Board recommendations (with the possibility of elevation to the President or Congress), then the Board's ability to enforce safety would be strengthened by the added authority to impose them.

Third, the role and strength of the Board would become clearer if it had enhanced enforcement capabilities. In other words, the Board would be more powerful even if it merely had--but did not make use of--the authority to levy or seek fines, penalties, injunctions, decrees, restraining orders, or writs of mandamus. This is analogous to the

argument that certain Board capabilities, such as subpoena power and the authority to hold adjudicatory hearings, make the Board more effective even though they remain latent and rarely, if ever, exercised.

Fourth, monetary penalties could be made proportional to the seriousness of the Board's violations of the health and safety requirements. Fines might give DOE greater incentive (beyond that provided under the current oversight/advisory/recommendation framework) to improve health and safety, and provide the Board with another means of transmitting to DOE the priority or weight that should be accorded certain Board actions.

b. Countervailing Technical Health and Safety Disadvantages of the Regulatory Option

Among the technical disadvantages of the option are the following: First, achieving assurance of public health and safety could be further delayed when the current plans for DOE compliance are reoriented toward compliance with a new set of regulations. Safety depends ultimately not on the source or type of oversight or regulation, but rather on the actual implementation of and adherence to codes and standards by line management. As the post-TMI Kemeny Commission report (p. 9) states, "we are convinced that regulations alone cannot assure the safety of nuclear power plants. Indeed, once regulations become . . . voluminous and complex . . . they can serve as a negative factor in nuclear safety." It is unclear what improvement in protecting public health and safety would result from allowing the Board to set, rather than simply suggest, standards. In short, formal regulation may add little to the Board's current oversight authority.

Second, it is common that a regulated entity may be less forthcoming and cooperative in a more formal regulatory relationship; external regulation will not necessarily induce excellence in technical undertakings. The historical success of industry and consensus standards such as those promulgated by professional organizations contrast with the mixed results of (compulsory) legal requirements. Successful examples are standards developed by Underwriters Laboratories and the Institute for Nuclear Power Operations (INPO), and the American Society of Mechanical Engineers (ASME).

Third, health and safety issues may be resolved less expeditiously than at present. More formal regulation could well mean more emphasis on "due process," a greater likelihood of appeals, greater reliance on legal staff, and more opportunity for legal intervention by external groups. Technical issues are rarely justiciable in the conventional sense; the closer a regulatory regime comes to the formal, intrusive, legalistic model (i.e., the closer it comes to formal regulation with licensing), the more the substance of health and safety is encumbered by form and process.

Fourth, commitment to implementation may not be any better in response to edicts than in response to recommendations. DOE's record of taking action in response to enforcement action under environmental statutes is poor. There is no analytical reason to believe its response to enforcement action by the Board would be any better.

Fifth, in a formal regulatory relationship with DOE, the Board might be reluctant to recommend actions that go beyond mandatory, enforceable regulations, which are typically minimum standards. On the other hand, an extraordinary degree of discipline and control would be required to avoid pitfalls such as the appearance of "ratcheting standards."

c. Economic (Cost-Benefit) Disadvantages Associated with Regulatory Option

First, a large staff would be needed to set and enforce standards in a thorough and formal manner. Administrative costs would increase commensurately, necessitating an increase in resources and budget. It is questionable whether such increased costs would be outweighed by the benefits conferred by the policy shift.

Second, in a regulatory interaction, DOE might be less likely to identify the advantages and disadvantages, technical and economic, of addressing various health and safety problems (i.e., to provide the Board a kind of cost-benefit analysis of its actions). DOE would naturally fear that the regulator would enforce any actions it mandated, including those suggested in good faith by DOE itself. A more intrusive, formal regulatory framework might reduce or eliminate this source of feedback and potential safety improvements.

Third, monetary penalties are unlikely to be effective when imposed on a government activity since both the overseer and the regulated entity are funded by the Treasury. Such activity is essentially "taking money from one pocket and putting it in another," although this might have symbolic importance. The public may perceive such action as a strong response. In many instances, agencies may care more about autonomy than dollars and cents. Non-pecuniary enforcement actions--such as injunctions, decrees, restraining orders, or writs of mandamus--might be more effective than monetary penalties. Yet, non-pecuniary enforcement actions differ more in form than substance from the Board's existing statutory powers (e.g., to hold hearings, make recommendations, establish reporting requirements, etc.) In other words, maintaining or slightly augmenting the Board's existing statutory authorities might provide as much protection of public health and safety as granting the Board the power to seek or levy monetary penalties.

Fourth, it would be exceedingly difficult for the Board or another agency to set, justify, and defend specific monetary penalties for DOE infractions of standards. Neither extensive experience nor an accepted analytical model is available to guide such an

undertaking. Essentially any fine imposed would run the risk of being challenged legally or overridden politically. Either the Board's existing statutory powers or the authority to impose non-pecuniary penalties would be more immune to attack.

4. Potential Licensing of Defense Nuclear Facilities and Weapons Activities

The Atomic Energy Act of 1954 established a licensing process for the commercial use of radioactive and fissionable materials. This licensing process remains largely intact today, though some modifications have been made to nuclear power plant licensing. The Act excluded licensing of defense nuclear facilities, many of which were already under construction or built and operating in 1954.

It may be argued that licensing of defense nuclear facilities, Federally-owned and operated with tax funds, would not be inconsistent per se with the purposes and objectives of Federal licensing. However, many of the drawbacks of regulating the defense nuclear complex, analyzed above, are also applicable to licensing. In addition, licensing would present its own special difficulties. In the commercial sphere, licensing schemes contemplate the agency refusing a license request. FCC can deny transfer of a television band license; FAA can refuse certification of aircraft; NRC can decline to allow construction of a commercial nuclear power plant. In the defense nuclear field, denial of a license for an existing facility would mean it would have to close down. Denial of a license to an operating facility needed to maintain the nuclear stockpile would have obvious national security and defense implications. Moreover, many existing facilities are in need of decommissioning and cleanup; they cannot be simply "closed down" as is.

Licensing applied only to new facilities has the advantage that license denial has a clear meaning: construction may not commence. But what does denial of a license mean if the President has decided a new facility is essential to the national defense? Or if the EPA has ordered that Hanford liquid wastes be removed from leaking tanks and processed in a new, as yet unlicensed, facility? Overriding national security, safety, and environmental objectives may mandate that new facilities be constructed and operated. This is quite unlike private entities seeking Federal permission to conduct discretionary activities intended to provide a public service and generate financial profits. The President and the Congress are constitutionally empowered to determine the need for constructing new facilities and for maintaining or decommissioning existing facilities.

These considerations suggest that licensing of defense nuclear facilities might best focus not on whether an activity should be carried on at all, but rather on developing conditions for safe operation, reduction of environmental impact, protection of worker and public safety, and related issues. Even to carry out this limited form of licensing, however, one would have to address a number of practical issues, such as:

(1) what are the technical criteria for licensing?
(2) what procedures will be used?
(3) who will be the license applicant?
(4) how will the public participate?
(5) what will be the role of State and local governments?
(6) how is continued compliance with license terms to be assured?
(7) can the license be suspended or revoked, and if so, how is the impact on national security to be weighed?
(8) can the sometimes staggering cost of licensing be afforded?

Licensing of facilities that conduct nuclear weapons operations would present additional dilemmas. Most obvious is the impact of national security concerns: information regarding nuclear weapons design, construction, and operation must remain secret despite the end of the superpower arms race. Some previously classified nuclear defense information is now publicly available or is termed "Unclassified Controlled Nuclear Information" (UCNI), a category which would permit limited disclosure to members of the public. Nevertheless, weapons design information, research work, and certain data concerning the location and maintenance of the nuclear stockpile must remain classified. This information should never be disclosed in a public forum, nor should it be disclosed to anyone lacking a security clearance and a need to know. However, licensing by its very nature is a public process, and hence licensing of nuclear weapons facilities is impractical insofar as classified data would be involved. No apparent public interest would be served by using licensing in any form for operations involving nuclear weapons.

Though the need to achieve public acceptance of Federal actions has vastly increased since 1954, the Atomic Energy Act makes clear that the principal goal of Federal nuclear programs is to provide for the national security needs of the nation. In declaring the policy of the United States, Congress stated that the development, use, and control of atomic energy "shall be directed so as to make the maximum contribution to the general welfare, subject at all times to the paramount objective of making the maximum contribution to the common defense and security . . . ." 42 U.S.C. § 2011. That national policy endures.

APPENDIX A

1994 RECOMMENDATIONS

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

[Recommendation 94–1]

Improved Schedule for Remediation in the Defense Nuclear Facilities Complex

AGENCY: Defense Nuclear Facilities Safety Board.

ACTION: Notice; recommendation.

SUMMARY: The Defense Nuclear Facilities Safety Board has made a recommendation to the Secretary of

Energy pursuant to 42 U.S.C. 2286a concerning improved schedule for remediation in the defense nuclear facilities complex. The Board requests public comments on this recommendation.

DATES: Comments, data, views, or arguments concerning this recommendation are due on or before July 5, 1994.

ADDRESSES: Send comments, data, views, or arguments concerning this recommendation to: Defense Nuclear Facilities Safety Board, 625 Indiana Avenue, NW., suite 700, Washington, DC 20004.

FOR FURTHER INFORMATION CONTACT: Kenneth M. Pusateri or Carole C. Morgan, at the address above or telephone (202) 208–6400.

Dated: May 31, 1994.

John T. Conway,

Chairman.

Improved Schedule for Remediation in the Defense Nuclear Facilities Complex

The halt in production of nuclear weapons and materials to be used in nuclear weapons froze the manufacturing pipeline in a state that, for safety reasons, should not be allowed to persist unremediated. The Board has concluded from observations and discussions with others that imminent hazards could arise within two to three years unless certain problems are corrected.

We are especially concerned about specific liquids and solids containing fissile materials and other radioactive substances in spent fuel storage pools, reactor basins, reprocessing canyons, processing lines, and various buildings once used for processing and weapons manufacture.

It is not clear at this juncture how fissile materials produced for defense purposes will eventually be dealt with long term. What is clear is that the extant fissile materials and related materials require treatment on an accelerated basis to convert them to forms more suitable for safe interim storage.

The Board is especially concerned about the following situations:

- Several large tanks in the F-Canyon at the Savannah River Site contain tens of thousands of gallons of solutions of plutonium and trans-plutonium isotopes. The trans-plutonium solutions remain from californium-252 products; they include highly radioactive isotopes of americium and curium. These tanks, their appendages, and vital support systems are old, subject to deterioration, prone to leakage, and are not seismically qualified. If an earthquake or other accident were to breach the tanks, F-Canyon would become so contaminated that cleanup would be practically impossible. Containment of the radioactive material under such circumstances would be highly uncertain.
- The K-East Basin at the Hanford Site contains hundreds of tons of deteriorating irradiated nuclear fuel from the N-Reactor. This fuel has been heavily corroded during its long period of storage under water, and the bottom of the basin is now covered by a thick deposit of sludge containing antinide compounds and fission products. The basin is near the Columbia River. It has leaked on several occasions, is likely to leak again, and has design and construction defects that make it seismically unsafe.
- The 603 Basin at the Idaho National Engineering Laboratory (INEL) contains deteriorating irradiated reactor fuel from a number of sources. This basin also contains sludge from corrosion of the reactor fuel. The seismic competence of the 603 Basin is not established.
- Processing canyons and reactor basins at the Savannah River Site contain large amounts of deteriorating irradiated reactor fuel stored under conditions similar to those at the 603 Basin at INEL.
- There are thousands of containers of plutonium-bearing liquids and solids at the Rocky Flats Plant, the Hanford Site, the Savannah River Site, and the Los Alamos National Laboratory. These materials were in the nuclear-weapons-manufacturing pipeline when manufacturing ended. Large quantities of plutonium solutions are stored in deteriorating tanks, piping, and plastic bottles. Thousands of containers at the Rocky Flats Plant hold miscellaneous plutonium-bearing materials classed as "residuals", some of which are chemically unstable. Many of the containers of plutonium metal also contain plastic and, in some at the Rocky Flats Plant, the plastic is believed to be in intimate contact with the plutonium. It is well known that plutonium in contact with plastic can cause formation of hydrogen gas and pyrophoric plutonium compounds leading to a high probability of plutonium fires.

We note that removal of fissile materials from the 603 Basin at INEL has begun. We are also following the plans for remedying several of the other situations listed. In general these plans are at an early stage. In addition, we are aware of steps DOE has taken to assess spent fuel inventories and vulnerabilities. We also note that a number of environmental assessments are being conducted in relation to the situations we have listed above. Finally, we note that a draft DOE Standard has been prepared for methods to be used in safe storage of plutonium metal and plutonium oxide.

These actions notwithstanding, the Board is concerned about the slow pace of remediation. The Board believes that additional delays in stabilizing these materials will be accompanied by further deterioration of safety and unnecessary increased risks to workers and the public.

Therefore the Board recommends:

(1) That an integrated program plan be formulated on a high priority basis, to convert within two to three years the materials addressed in the specific recommendations below, to forms or conditions suitable for safe interim storage. This plan should recognize that remediation will require a systems engineering approach, involving integration of facilities and capabilities at a number of sites, and will require attention to limiting worker exposure and minimizing generation of additional waste and emission of effluents to the environment. The plan should include a provision that, within a reasonable period of time (such as eight years), all storage of plutonium metal and oxide should be in conformance with the draft DOE Standard on storage of plutonium now being made final.

(2) That a research program be established to fill any gaps in the information base needed for choosing among the alternate processes to be used in safe conversion of various types of fissile materials to optimal forms for safe interim storage and the longer term disposition. Development this research program should be addressed in the program plan called for by (1) above.

(3) That preparations be expedited to process the dissolved plutonium and trans-plutonium isotopes in tanks in the F-Canyon at the Savannah River Site into forms safer for interim storage. The Board considers this problem to be especially urgent.

(4) That preparations be expedited to repackage the plutonium metal that is in contact with, or in proximity to, plastic and to eliminate the associated existing hazard in any other way that is feasible and reliable. Storage of plutonium materials generated through this remediation process should be such that containers need not be opened again for additional treatment for a reasonably long time.

(5) That preparations be expedited to process the containers of possibly unstable residues at the Rocky Flats Plant and to convert constituent

plutonium to a form suitable for safe interim storage.

(6) That preparations be expedited to process the deteriorating irradiated reactor fuel stored in basins at the Savannah River Site into a form suitable for safe interim storage until an option for ultimate disposition is selected.

(7) That the program be accelerated to place the deteriorating reactor fuel in the K-East Basin at the Hanford Site in a stable configuration for interim storage until an option for ultimate disposition is chosen. This program needs to be directed toward storage methods that will minimize further deterioration.

(8) That those facilities that may be needed for future handling and treatment of the materials in question be maintained in a usable state. Candidate facilities include, among others, the F- and H-Canyon and the FB- and HB-Lines at the Savannah River Site, some plutonium-handling glove box lines among those at the Rocky Flats Plant, the Los Alamos National Laboratory, and the Hanford Site, and certain facilities necessary to support a uranium handling capability at the Y–12 Plant at the Oak Ridge Site.

(9) Expedited preparations to accomplish actions in items (3) through (7) above should take into account the need to meet the requirements for operational readiness in accordance with DOE Order 5480.31.

John T. Conway,

Chairman.

[FR Doc. 94–13509 Filed 6–2–94; 8:45 am]

BILLING CODE 6820–KD–M

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

[Recommendation 94–2]

Conformance With Safety Standards at DOE Low-Level Nuclear Waste and Disposal Sites

AGENCY: Defense Nuclear Facilities Safety Board.

ACTION: Notice; recommendation.

SUMMARY: The Defense Nuclear Facilities Safety Board has made a recommendation to the Secretary of Energy pursuant to 42 U.S.C. 2286a concerning conformance with safety standards at DOE low-level nuclear waste and disposal sites. The Board requests public comments on this recommendation.

DATES: Comments, data, views, or arguments concerning this recommendation are due on or before October 17, 1994.

ADDRESSES: Send comments, data, views, or arguments concerning this recommendation to: Defense Nuclear Facilities Safety Board, 625 Indiana Avenue NW., Suite 700, Washington, DC 20004–2901.

FOR FURTHER INFORMATION CONTACT: Kenneth M. Pusateri or Carole C. Morgan, at the address above or telephone (202) 208–6400.

Dated: September 12, 1994.

John T. Conway,

Chairman.

Dated: September 8, 1994.

The high-level radioactive wastes that are a result of weapons material production have been the strong focus of waste management activities of the Department of Energy (DOE). Considerably less attention has been placed upon the large volumes of low-level radioactive waste that have been generated to date and that are projected for the future. Operation of waste management facilities and the maintenance of the defense nuclear complex will continue to generate considerable low-level waste and the need for adequate waste storage and disposal facilities. This volume is likely to increase dramatically with the decommissioning and decontamination of excess facilities.

The Board and its staff have been reviewing low-level waste management within the defense nuclear complex pursuant to 42 U.S.C. 2286a(a)(1), which requires the Board to review and evaluate the content and implementation of standards, including DOE orders and regulations, at defense nuclear facilities. DOE Order 5820.2A, *Radioactive Waste Management*, and the Nuclear Regulatory Commission's regulation on low-level waste disposal, Code of Federal Regulations Section 10 Part 61, have provided the basic frame of reference for this review. Further, it was useful to examine the low-level waste management program of the Department in terms of its past, present, and the future operations.

The results of our review are summarized as follows:

- As of 1993, the DOE and its predecessor agencies have buried approximately 2.8 million cubic meters of low-level radioactive waste. This waste has largely been disposed of at six sites through the use of shallow land burial—Savannah River Site, Hanford, Idaho National Engineering Laboratory, Oak Ridge National Laboratory, Nevada Test Site, and Los Alamos National Laboratory.
- Low-level waste disposal as practiced by DOE contractors has not kept pace with the evolution of commercial practices. For example, DOE disposal programs are generally characterized by minimal barriers to infiltration and biologic intrusion, no requirements to protect inadvertent human intruders, and operational practices not geared toward maintaining integrity of the waste form and the cover.
- In 1988, DOE issued Order 5820.2A, *Radioactive Waste Management*, which adopted the basic performance objectives of the Nuclear Regulatory Commission's 10 CFR part 61. A key feature of the Order is the requirement to prepare a Performance Assessment (PA). This Performance Assessment is intended to demonstrate that the buried waste will remain sufficiently confined to pose no undue risk to public health and safety. Although the Order was issued six years ago, no defense nuclear facilities site has to date completed the performance assessment process.
- In establishing low-level waste burial ground source terms, current DOE guidance for performance assessments required by DOE Order 5820.2A allows the evaluators to neglect waste disposed of prior to 1988. Further, it allows evaluators to apply reference dose criteria to disposal facilities individually rather than assessing composite effects when contiguous burial facilities exist. A number of other factors also complicate site specific assessments. For example: (1) A commercial low-level waste burial site is situated adjacent to a DOE burial site at Hanford; (2) some sites have multiple burial grounds, a situation not explicitly addressed by DOE Order 5820.2A; and (3) agreements have been established with State/Environmental Protection Agency authorities for closeout of some burial sites under the Resource Conservation Recovery Act and the Comprehensive Environmental Response, Compensation, and Liability Act provisions.
- Some effort is being made by those tasked with site waste management to have generators of waste provide long-range forecasts of the amount of wastes they will have to send for disposal, but the forecasts are beset with such uncertainty as to provide little confidence in the projections. This is especially true as the projections pertain to wastes from decontamination and decommissioning, and environmental restoration.

The DOE's burial of low-level waste in some locations within the complex actually constitutes nuclear waste storage, since inadequate emplacement may require later retrieval of the waste, further processing or packaging, and final disposal in a demonstrably adequate facility. Given the substantial volume of low-level waste buried prior to 1988 in old burial sites using practices which do not meet current standards, the lack of complete compliance with requirements of DOE Order 5820.2A at currently operating sites, and the likely dramatic increase in future waste volumes, the Board recommends that:

1. A comprehensive complex-wide review be made of the low-level waste issue similar to the review the Department conducted regarding spent nuclear fuel. As with spent fuel, the objective of such review should be the establishment of the dimensions of the low-level waste problem and the identification of necessary corrective actions to address safe disposition of past, present, and future volumes. The Implementation Plan provided the Board should include:

a. A regularized program for forecasting future burial needs relative to existing capacity, taking into account the projected programs for decontamination and decommissioning of defense nuclear facilities and environmental restoration activities as well as current operational units.

b. The development and issuance of additional requirements, standards or guidance on low-level waste

management that address safety aspects of waste form and packaging, burial ground siting and performance assessment, facility design, construction, operation, and closure, and environmental monitoring. Such guidance should reflect consideration of concepts of good practices in low-level waste management as applied in the commercial sector, both nationally and internationally, and results of DOE's technological developments and advisories to the State Compacts pursuant to the Low Level Radioactive Waste Nuclear Waste Policy Act of 1982, as amended.

c. Planned studies directed towards (1) improving modeling and predictive capability for assessing migration of radionuclides and (2) enhancing the stability of buried waste forms, deterring intrusion and inhibiting migration of radionuclides.

d. Studies of enhanced methods that can be used to reduce the volume of waste to be disposed of, such as compaction and more environmentally acceptable incineration.

e. Assessments of the safety merits/demerits of privatization of facilities for disposal of DOE low-levels wastes.

2. More immediate steps be taken to complete the performance assessment process for all active low-level waste burial sites as required by DOE Order 5820.2A. In so doing clarifying instructions should be issued to insure that:

a. Performance assessments are based upon the total inventories (past, present, and future) emplaced or planned for the burial site(s).

b. Performance objectives (dose criteria) of DOE Order 5820.2A are achieved for the composite of all low-level waste disposal facilities on the site.

3. If non-compliance with reference dose criteria set forth in DOE Order 5820.2A is found, an action plan with schedule be developed for bringing operations into compliance or other acceptable compensating measures be undertaken in the interim pending final closure.

John T. Conway,

Chairman.

September 8, 1994.

The Honorable Hazel R. O'Leary,
Secretary of Energy,
Washington, DC 20585

Dear Secretary O'Leary: On September 8, 1994, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. 2286a(5), unanimous approved Recommendation 94–2 which is enclosed for your consideration. Recommendation 94–2 deals with Conformance with Safety Standards at DOE Low-Level Nuclear Waste and Disposal Sites.

42 U.S.C. 2286d(a) requires the Board, after receipt by you, to promptly make this recommendation available to the public in the Department of Energy's regional public reading rooms. The Board believes the recommendation contains no information which is classified or otherwise restricted. To the extent this recommendation does not include information restricted by DOE under the Atomic Energy Act of 1954, 42 U.S.C. 2161–68, as amended, please arrange to have this recommendation promptly placed on the file in your regional public reading rooms.

The Board will publish this recommendation in the **Federal Register**.

John T. Conway,

Chairman.

[FR Doc. 94–22875 Filed 9–14–94; 8:45 am]
BILLING CODE 6820–KD–M

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

[Recommendation 94–3]

Rocky Flats Seismic and Systems Safety

AGENCY: Defense Nuclear Facilities Safety Board.

ACTION: Notice; recommendation.

SUMMARY: The Defense Nuclear Facilities Safety Board has made a recommendation to the Secretary of Energy pursuant to 42 U.S.C. 2286a concerning Rocky Flats seismic and systems safety. The Board requests public comments on this recommendation.

DATES: Comments, data, views, or arguments concerning this recommendation are due on or before November 3, 1994.

ADDRESSES: Send comments, data, views, or arguments concerning this recommendation to: Defense Nuclear Facilities Safety Board, 625 Indiana Avenue NW., Suite 700, Washington, DC 20004–2901.

FOR FURTHER INFORMATION CONTACT: Kenneth M. Pusateri or Carole C. Morgan, at the address above or telephone (202) 208–6400.

Dated: September 28, 1994.

John T. Conway,

Chairman.

[Recommendation 94–3]

Rocky Flats Seismic and Systems Safety

Dated: September 26, 1994.

In its Recommendation 90–5, the Defense Nuclear Facilities Safety Board (Board) recommended that a site-wide Systematic Evaluation Program be conducted at the Rocky Flats Plant (now the Rocky Flats Environmental Technology Site), to determine if safety upgrades should be instituted to enable the defense nuclear buildings and facilities to meet current safety requirements. The mission of the Rocky Flats Environmental Technology Site has changed since the issuance of Recommendation 90–5, and the Implementation Plan for the Recommendation has been revised to more directly address the current mission of the Site.

The Board has been informed in briefings by the Department of Energy (DOE) that Building 371 is considered to be structurally the best on-site facility for the storage of plutonium, and that steps are therefore scheduled that in time will move the major part of the Site's plutonium inventory into storage in this building. As a result, Building 371 will assume a unique role as the storehouse which contains the largest single accumulation of plutonium in the DOE complex. It follows that potential health and safety issues associated with this proposed use of the building also assume very high importance.

Accordingly, the Board has been reviewing potential public health and safety issues at Building 371, and in particular, the building's capacity to provide reasonable assurance of protection of public health and safety should it be subjected to external forces from natural phenomena (earthquakes, extreme winds, and floods). The Board has observed that DOE's ongoing studies in the Systematic Evaluation Program to better identify the potential hazards from natural phenomena at Building 371 and to establish means of protecting against them are not well integrated. An effective systematic Evaluation Program requires a more thorough application of the systems engineering process. The Board has concluded that activities currently underway in this respect, to prepare Building 371 for its extended role in storage of plutonium, are not logically structured and are not sufficiently encompassing in either detail or scope to assure that the health and safety of the public will be adequately protected.

Therefore, the Board recommends:

1. That an Integrated Program Plan be formulated to address the civil-structural-seismic safety issues and evaluations related to the planned use of Building 371 for storage of plutonium and related functions. This plan needs to be founded on the principles of systems engineering and realistic schedules. Several studies, pertinent to such a plan, are geologic fault investigations, groundmotion studies, dynamic building analyses, and soil-structure interaction analyses. These studies and other elements need to be

combined with the building mission and any other functional criteria using systems engineering principles to develop the Integrated Program Plan.

2. That the above plan address and explain any requirements for changes to the current Safety Analysis Report and how such changes will be accomplished. This includes effects from earthquakes, extreme winds, and floods.

3. That a comprehensive document be completed describing in detail the structural analysis methodology and standards for the building analysis. This includes explaining analytical methods used and their applicability to the configuration of Building 371.

4. That the integrated program plan use both deterministic and probabilistic methods to establish the vibratory groundmotion criteria that will be used in the structural evaluation of Building 371. This includes a rationale for reconciling differences between the two methods. Moreover, these criteria should incorporate the results of a carefully planned and executed site geological faulting investigations.

5. That a hazard classification be selected for Building 371 which is supported by rational analysis. This requires consideration of the mission, period of intended use, and importance of the building.

6. That the Integrated Program Plan, consistent with the hazard classification, include the plan for classification of safety systems on a rational basis consistent with the mission, life, and importance of Building 371. Issues associated with hazard classification and classification of safety systems are discussed in the Board's April 29, 1994, letter to Under Secretary Curtis.

7. That any standards used in evaluating hazards from natural and man-made phenomena be comparable to those used in commercial nuclear practice.

8. That the Program Plan and the results of its activities be used to specify building upgrade and improvements consistent with the mission of Building 371.

John T. Conway,

Chairman.

September 26, 1994.

The Honorable Hazel R. O'Leary,
Secretary of Energy,
Washington, DC 20585.

Dear Secretary O'Leary: On September 26, 1994, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(5), unanimously approved Recommendation 94–3 which is enclosed for your consideration. Recommendation 94–3 deals with Rocky Flats Seismic and Systems Safety.

42 U.S.C. § 2286d(a) requires the Board, after receipt by you, to promptly make this recommendation available to the public in the Department of Energy's regional public reading rooms. The Board believes the recommendation contains no information which is classified or otherwise restricted. To the extent this recommendation does not include information restricted by DOE under the Atomic Energy Act of 1954, 42 U.S.C. §§ 2161–68, as amended, please arrange to have this recommendation promptly placed on file in your regional public reading rooms.

The Board will publish this recommendation in the **Federal Register**.

Sincerely,

John T. Conway,

Chairman.

[FR Doc. 94–24412 Filed 10–3–94; 8:45 am]

BILLING CODE 6820–KD–M

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

[Recommendation 94–4]

Deficiencies in Criticality Safety at Oak Ridge Y–12 Plant

AGENCY: Defense Nuclear Facilities Safety Board.

ACTION: Notice; recommendation.

SUMMARY: The Defense Nuclear Facilities Safety Board has made a recommendation to the Secretary of Energy pursuant to 42 U.S.C. 2286a concerning deficiencies in criticality safety at Oak Ridge Y–12 Plant. The Board requests public comments on this recommendation.

DATES: Comments, data, views, or arguments, concerning this recommendation are due on or before November 4, 1994.

ADDRESSES: Send comments, data, views, or arguments concerning this recommendation to: Defense Nuclear Facilities Safety Board, 625 Indiana Avenue, NW., Suite 700, Washington, DC 20004–2901.

FOR FURTHER INFORMATION CONTACT: Kenneth M. Pusateri or Carole C. Morgan, at the address above or telephone (202) 208–6400.

DATED: September 30, 1994.

John T. Conway,

Chairman.

[Recommendation 94–4]

Deficiencies in Criticality Safety at Oak Ridge Y–12 Plant

Dated: September 27, 1994.

The Defense nuclear Facilities Safety Board (Board) has issued a number of recommendations concerning formality of operations; including Recommendation 92–5, Discipline of Operations in a Changing Defense Nuclear Facilities Complex. In that recommendation, the Board stated that facilities schedule for continued operations should develop a style and level of conduct of operations which is comparable to that achieved at commercial nuclear facilities. Recommendation 92–5 further noted that, prior to achieving an acceptable level of formality, major improvements were required in a number of areas, including safety analysis reports, limiting conditions of operation, and training and qualification of personnel.

The Board and its staff have been monitoring the Department of Energy's (DOE) efforts to implement an acceptable level of conduct of operations at the Y–12 Plant in Oak Ridge, Tennessee, which is scheduled for continued operations. The Board has forwarded a number of reports to DOE during the last two years indicating the existence of safety-related concerns regarding operations at Y–12. DOE and its operating contractor, Martin-Marietta Energy Systems (MMES), have taken some actions to correct deficiencies; however, a number of recent events have led the Board to the conclusion that more aggressive and comprehensive management actions are required to bring the level of conduct of operations at Y–12 to a satisfactory level.

The Board notes that during the past four months a number of violations of Operational Safety Requirements and other safety limits have occurred at the Y–12 Plant. Most recently, the Board's staff identified a substantial violation of nuclear criticality safety limits within a special nuclear material storage vault at Y–12. When the staff identified this deficiency to on-site personnel, including a senior MMES manager, an MMES nuclear criticality safety specialist, and one of DOE's facility representatives, immediate corrective actions that were required by Y–12 procedures were not taken. In fact, proper corrective actions that were required by Y–12 procedures were not taken. In fact, proper corrective actions were not taken until the Board's staff informed the DOE Y–12 Site Manager. Subsequently MMES curtailed a number of operations at the Y–12 Plant. Reviews of compliance with nuclear criticality safety limits at the Y–12 Plan revealed that a widespread level of noncompliance exists.

In its Annual Report to Congress (February 1994) the Board noted that personnel and procedures are complementary elements in implementing conduct of operations. The report stated, "The health and safety of the public and workers rest on a properly trained workforce accomplishing tasks in a formal deliberate fashion in accordance with reviewed and approved procedures." In responding to the Board's Recommendation 93–6, Maintaining Access to Nuclear Weapons Experience, DOE is evaluating the impact of expertise presently being lost through ongoing staff reductions on their ability to perform nuclear weapons dismantlement at Y–12.

The Board recognizes that DOE and MMES management have begun taking aggressive actions to correct the specific problems of adherence to nuclear criticality safety limits, since the nuclear criticality safety occurrence referred to above. However, the Board believes that more remains to be done. According, the Board recommends that:

(1) DOE determine the immediate actions necessary to resolve the nuclear criticality safety deficiencies at the Y–12 Plant, including actions deemed necessary before restarting curtailed operations and any compensatory measures instituted. These actions should be documented, along with an explanation of how the deficiencies remained undetected by MMES and DOE (line and oversight).

(2) DOE perform the following for defense nuclear facilities at the Y–12 Plant:

(a) An evaluation of compliance with Operational Safety Requirements and Criticality Safety Approvals (CSAs), including a determination of the root case of any identified violations. In performing this assessment, DOE should use the experience gained during similar review at the Los Alamos plutonium facility and during the recent "maintenance mode" at the Pantex Plant.

(o) A comprehensive review of the nuclear criticality safety program at the Y–12 Plant, including: the adequacy of procedural controls, the utility of the nuclear criticality safety approvals, and a root case analysis of the extensive level of non-compliance found in recent reviews.

(c) A comparison of the current level of conduct of operations to the level expected by DOE in implementing the Board's Recommendation 92–5.

(d) Development of plans, including schedules, to address any deficiencies identified in the analyses conducted above.

(3) DOE evaluate the experience, training, and performance of key DOE and contractor personnel involved in safety-related activities at defense nuclear facilities within the Y–12 Plan to determine if those personnel have the skills and knowledge required to execute their nuclear safety responsibilities (in this regard, reference should be made to the critical safety elements developed as part of DOE's response to the Board's Recommendation 93–1).

(4) DOE take whatever actions are necessary to correct any deficiencies identified in (3) above in the experience, training, and performance of DOE and contractor personnel.

John T. Conway,

Chairman.

Appendix—Transmittal Letter to Secretary of Energy

September 27, 1994.

Hon. Hazel R. O'Leary,
Secretary of Energy,
Washington, DC.

Dear Secretary O'Leary: On September 27, 1994, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(5), unanimously approved Recommendation 94–4 which is enclosed for your consideration. Recommendation 94–4 deals with Deficiencies in Criticality Safety at Oak Ridge Y–12 Plant.

42 U.S.C. § 2286d(a) requires the Board, after receipt by you, to promptly make this recommendation available to the public in the Department of Energy's regional public reading rooms. The Board believes the recommendation contains no information which is classified or otherwise restricted. To the extent this recommendation does not include information restricted by DOE under the Atomic Energy Act of 1954, 42 U.S.C. §§ 2161–68, as amended, please arrange to have this recommendation promptly placed on file in your regional public reading rooms.

The Board will publish this recommendation in the Federal Register.

Sincerely,

John T. Conway,

Chairman.

[FR Doc. 94–24604 Filed 10–4–94; 8:45 am]

BILLING CODE 6820–KD–M

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

[Recommendation 94–5]

Integration of DOE Safety Rules, Orders, and Other Requirements

AGENCY: Defense Nuclear Facilities Safety Board.

ACTION: Notice; recommendation.

SUMMARY: The Defense Nuclear Facilities Safety Board has made a recommendation to the Secretary of Energy pursuant to 42 U.S.C. 2286a concerning Integration of DOE Safety Rules, Orders, and Other Requirements. The Board requests public comments on this recommendation.

DATES: Comments, data, views, or arguments concerning this recommendation are due on or before February 6, 1995.

ADDRESSES: Send comments, data, views, or arguments concerning this recommendation to: Defense Nuclear Facilities Safety Board, 625 Indiana Avenue, NW., Suite 700, Washington, DC 20004.

FOR FURTHER INFORMATION CONTACT: Kenneth M. Pusateri or Carole C. Morgan, at the address above or telephone (202) 208–6400.

Dated: January 2, 1995.

John T. Conway,

Chairman.

[Recommendation 94–5]

The Board has been following with considerable interest the structure of DOE's nuclear health and safety requirements as the transition is being made from the use of Orders to rulemaking. The Board recognizes that the change has been prompted by provisions of the Price/Anderson Act Amendments of 1988, the need for uniform, enforceable requirements, and by a desire of the Department to provide greater opportunities for public input into the process for establishment of requirements. Thus the Board understands the reasons for development and promulgation of nuclear safety requirements through rulemaking. However, the Board has expressed reservations in the past and remains concerned today lest the process of conversion of Orders to rules is used as occasion to:

(1) Unduly relax or eliminate important nuclear safety requirements in Orders.

(2) Relegate good nuclear safety practices extant in existing Orders to optional status.

(3) Forego or delay current efforts to bring safety practices into compliance with mutually agreed implementation plans that respond to recommendations of the Board.

In accepting Recommendation 91–1, your predecessor advised that rulemaking would be a time-consuming process, and he committed to expedited issuance and implementation of updated requirements in DOE Orders while rules are developed. More recently, in your response of October 21, 1994 to the Board's May 6, 1994 inquiry to the Department, you also acknowledged the need for interim development, revision, and compliance with requirements in DOE Orders while rules are being promulgated.

In fact, your response reflected more completely the process that has been developed in discussions with the Board and its staff. It stated that:

(1) The Department is committed to a requirements-based safety management program.

(2) Environment, safety and health requirements are identified in rules and Orders.

(3) Orders are the prevailing means by which the Department identifies management objectives that are requirements for its personnel, and when incorporated into contracts, requirements for DOE contractors.

(4) Nuclear safety Orders are being phased into rules. Rules are the documents by which the DOE establishes binding requirements of general applicability and are adopted pursuant to the Administrative Procedures Act.

(5) Contractors are expected to comply with a rule or Order when it becomes effective.[1]

(6) Standards/Requirements Identification Documents (S/RIDs) are developed as compilations of site and facility-specific requirements contained in applicable legislation, rules, Orders, technical standards and other directives necessary to operate facilities or conduct DOE activities with adequate protection of workers and the general public.

This summary clearly shows that DOE intends that the definition of what constitutes adequacy in the way of protection of workers and the public extends beyond the requirements of rules. In that, the Board definitely concurs. It is the compilation of requirements as envisaged for RIDs that represents the more comprehensive base upon which sites and facilities are to be managed from the environment, health and safety viewpoint. This has also been the thrust of many of the Board recommendations dealing with Order compliance.

However, the action toward development of S/RIDs has been slow. Requirements in Orders have been and are still the prevailing DOE means for defining safety requirements for contractors. Requirements in Orders are made enforceable by incorporating Orders into contracts. Therefore, the Board has reviewed a number of existing M & O contracts relative to provisions for Order compliance. The Board has also examined the health and safety management specifications included in several recently proposed contract actions (for example, at Rocky Flats and Hanford/Solid Waste Management). Performance per conditions specified either in existing contracts or those more recently examined will not in our view assure delivery of the safety management programs we believe that the Board and the Department expect.

Though the Board has been reassured by your letter of October 21 and by other means that requirements in DOE Orders are to remain operative until replaced by rules, there appears to be contrary guidance being issued to the field. For example, a May 27, 1994 memorandum from the Assistant Secretary for Defense Programs provides guidance that in effect encourages a premature shift in resources from Order compliance to rule compliance. For rules that will have progressed far enough in the promulgation process that only a few months are left for a show of compliance, such action may be appropriate as regards establishing priorities in assigning resources. However, such action should not be construed as countenancing relaxation of necessary requirements of the existing Order. Moreover, for proposed rules not nearly so far along in the rule-making process, impending developments should not be taken as cause for a slowdown on compliance efforts or the upgrading of applicable requirements now in Orders and contracts.

Along similar lines, the Board has noted a November 30, 1994 advisory from the Albuquerque field office to DOE headquarters (M.S. Dienes to J. Fitzgerald) that a hold has been placed on the radiation protection functional appraisal process until DOE review and approval of the implementation plans for the rule have been completed. There is no rational justification for such deferral. Such action suggests that field personnel may have been led to believe that there will be marked differences between those radiation protection programs under the rule and the requirements under existing Orders incorporated in contracts.

The provisions of the contracts and the above-mentioned advisories by DOE line management indicate that the integrated use of nuclear safety-related Rules, Orders, standards and guides in defining and executing DOE's safety management program may not be sufficiently well understood by either the M & O contractors or DOE managers. This issue was raised in the Board's letter of May 6, 1994 to the Department.

Given the situation as described above, the Board believes that further DOE actions are needed to ensure there is no relaxation of commitments made to achieve compliance with requirements in Orders while proposed rules are undergoing the development process. These actions should also provide for smooth transition of Orders to rules once promulgated. Toward that end, the Board recommends that DOE:

(1) Widely disseminate the information provided to the Board in response to our May 6, 1994 letter on DOE's Safety Management Program, and take steps to ensure that key technical and contracts personnel are well schooled in this topic.

(2) Promptly issue appropriate directives and procedures to DOE Headquarters, Field Offices and O&M contractors which:

(a) Embrace the basic principle that work already commenced or planned to develop and implement requirements in existing or revised Orders or S/RIDS should continue while rulemaking is underway;

(b) Explain in detail the relationship between safety requirements contained in Orders in O&M contracts and those contained in new rules, and the process by which a rule may "supersede" parts, or the entirety, of a safety Order;

(c) Explain that compliance with a requirement whether in a rule, Order or other directive is not accomplished by submittal of an adequate implementation plan but requires completion of action proposed by that plan;

(d) Provide guidance to contractors and DOE program offices on how to coordinate implementation plans for multiple requirements such as those in

[1] Note: Rules actually require an implementation plan and then allow a period for achieving compliance. A similar phase-in period is permissible for requirements in Orders incorporated into contracts.

Orders, rules, S/RIDS and other binding directives; and,

(c) In the process of eliminating duplicate requirements and in arranging the remaining ones along more user friendly guidelines, which the Board agrees is desirable, ensure that existing requirements that are necessary and appropriate are not relaxed nor eliminated, and schedule commitments for achieving compliance are not delayed.

(3) Ensure that compliance with the minimal (base-line) set of safety requirements contained in Rules is not construed as full compliance with all necessary safety requirements and does not displace effort to develop and implement through RIDS the best nuclear safety requirements and practices embodied in rules, Orders, standards, and other safety directives.

(4) Clearly establish such line, oversight, and legal responsibilities for review and approval of contractual provisions specifying environment, health and safety requirements for DOE contractors to ensure that the requirements-based safety management program expected by the DOE will be uniformly developed and consistently imposed across the complex.

Defense Nuclear Facilities Safety Board

December 29, 1994.

The Honorable Hazel R. O'Leary,
Secretary of Energy, Washington, DC 20585.

Dear Secretary O'Leary: On December 29, 1994, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. 2286a(5), unanimously approved Recommendation 94–5 which is enclosed for your consideration. Recommendation 94–5 deals with Integration of DOE Safety Rules, Orders, and Other Requirements.

42 U.S.C. 2286d(a) requires the Board, after receipt by you, to promptly make this recommendation available to the public in the Department of Energy's regional public reading rooms. The Board believes the recommendation contains no information which is classified or otherwise restricted. To the extent this recommendation does not include information restricted by DOE under the Atomic Energy Act of 1954, 42 U.S.C. 2161–68, as amended, please arrange to have this recommendation promptly placed on file in your regional public reading rooms.

The Board will publish this recommendation in the Federal Register.

Sincerely,

John T. Conway,

Chairman.

[FR Doc. 95–363 Filed 1–5–95; 8:45 am]

BILLING CODE 6820–KD–M

APPENDIX B

REFERENCES

Pub. L. No. 100-456 (9/29/88) National Defense Authorization Act for Fiscal Year 1989

Pub. L. No. 101-510 (11/5/90) National Defense Authorization Act for Fiscal Year 1991

Pub. L. 102-190 (12/6/91) National Defense Authorization Act for Fiscal Years 1992 and 1993

Pub. L. 103-160 (11/30/93) National Defense Authorization Act for Fiscal Year 1994

10 C.F.R. Part 820, "Procedural Rules for DOE Nuclear Facilities," August 17, 1993 (58 Fed. Reg. 43,680)

10 CFR Part 830, "Nuclear Safety Management," April 5, 1994 (59 Fed. Reg. 15843)

10 C.F.R. Part 835, "Occupational Radiation Protection," December 14, 1993 (58 Fed. Reg. 65,458)

Energy Research Foundation v. Defense Nuclear Facilities Safety Board, 917 F.2d 581 (D.C. Cir. 1990)

Natural Resources Defense Council, Inc. v. Defense Nuclear Facilities Safety Board, 969 F.2d 1248 (D.C. Cir. 1992), cert. denied, 113 S. Ct. 2332 (1993)

Brief for the Defense Nuclear Facilities Safety Board, Natural Resources Defense Council v. Defense Nuclear Facilities Safety Board, 969 F.2d 1248 (D.C. Cir. 1992), cert. denied, 113 S. Ct. 2332 (1993)

Brief for the Defense Nuclear Facilities Safety Board in opposition to petition for a writ of certiorari, Natural Resources Defense Council v. Defense Nuclear Facilities Safety Board, 969 F.2d 1248 (D.C. Cir. 1992), cert. denied, 113 S.Ct. 2332 (1993)

Nuclear Protections and Safety Act of 1987, Report of the Committee on Governmental Affairs, United States Senate on S.1085, S. Rep. No. 173, 100th Cong., 1st Sess. (1987)

Nuclear Protections and Safety Act of 1987, Report of the Committee on Armed Services, United States Senate on S.1085, S. Rep. No. 232, 100th Cong., 1st Sess. (1987)

National Defense Authorization Act for Fiscal Year 1989, Report of the Committee on Armed Services, House of Representatives on H.R.4264, H.R. Rep. No. 563, 100th Cong., 2d Sess. (1988)

National Defense Authorization Act for Fiscal Year 1989, Conference Report to Accompany H.R.4481, H.R. Conf. Rep. No. 989, 100th Cong., 2d Sess. (1988)

Nominations Before the Senate Armed Services Committee, S. Rep. No. 537, 101st Cong., 1st Sess. (1989)

National Defense Authorization Act for Fiscal Year 1991, Committee on Armed Services, United States Senate, Report to Accompany S.2884, S. Rep. No. 384, 101st Cong., 2d Sess. (1990)

National Defense Authorization Act for Fiscal Year 1991, Conference Report to Accompany H.R.4739, H.R. Conf. Rep. No. 923, 101st Cong., 2d Sess. (1990)

National Defense Authorization Act for Fiscal Years 1992 and 1993, Committee on Armed Services, United States Senate, Report to Accompany S.1507, S. Rep. No. 113, 102d Cong., 1st Sess. (1991)

National Defense Authorization Act for Fiscal Years 1992 and 1993, Conference Report to Accompany H.R.2100, H.R. Conf. Rep. No.311, 102d Cong., 1st Sess. (1991)

National Defense Authorization Act for Fiscal Year 1994, Committee on Armed Services, United States Senate, Report to Accompany S.1298, S. Rep. No. 112, 103d Cong., 1st Sess. (1993)

National Defense Authorization Act for Fiscal Year 1994, Conference Report to Accompany H.R.2401, H.R. Conf. Rep. No. 357, 103d Cong., 1st Sess. (1993)

134 Cong. Rec. H2840 (daily ed. May 3, 1988) (statement of Rep. Sharp)

134 Cong. Rec. H2846 (daily ed. May 3, 1988) (statement of Rep. Eckert)

137 Cong. Rec. S9359 (daily ed. July 9, 1991)

137 Cong. Rec. S11442 (daily ed. July 31, 1991)

137 Cong. Rec. H10384 (daily ed. November 18, 1991)

140 Cong. Rec. S822 (daily ed. July 1, 1994)

Testimony of the DNFSB, FY 1991 Appropriations Hearing, House Committee on Appropriations, Subcommittee on Energy and Water Development, March 13, 1990

Testimony of the DNFSB, FY 1991 Atomic Energy Defense Activities Budget, Management and Oversight Hearing, DOE Defense Nuclear Facilities Panel, House Armed Services Committee, March 22, 1990

Testimony of the DNFSB, Hearings on Plans, Progress and Experience of the DNFSB, Management and Oversight Hearing, Subcommittee on Strategic Forces and Nuclear Deterrence, Senate Committee on Armed Services, March 27, 1990

Testimony of John T. Conway, Chairman DNFSB, Hearings on Safety of High-level Radioactive Waste Storage Tanks at DOE Facilities, Senate Committee on Governmental Affairs, July 30, 1990

Testimony of the DNFSB, Hearing on the DNFSB, Subcommittee on Energy and Water Development, House Committee on Appropriations, February 26, 1991

Testimony of John T. Conway, Chairman, DNFSB, Waste Isolation Pilot Plant Hearing, Subcommittee on Energy and the Environment, House Committee on Interior and Insular Affairs, April 15, 1991

Testimony of the DNFSB, FY 1992 and 1993 Authorization Hearing, Subcommittee on Strategic Forces and Nuclear Deterrence, Senate Committee on Armed Services, June 11, 1991

Testimony of the DNFSB, Waste Isolation Pilot Plant Hearing, DOE Defense Nuclear Facilities Panel, House Committee on Armed Services, June 18, 1991

Testimony of the DNFSB, Hearing on DOE: Environment, Safety and Health; Environmental Restoration and Waste Management, Subcommittee on Energy and Water Development, House Committee on Appropriations, March 2, 1992

Testimony of John T. Conway, Chairman, DNFSB, Hearings on DOE Defense Programs for FY-1993, House Committee on Armed Services, April 6, 1992

Testimony of John T. Conway, Chairman, DNFSB, Hearings on Shipment of Spent Nuclear Fuel from U.S. Navy Ships and Submarines to Idaho National Engineering Laboratory, Subcommittee on Nuclear Deterrence, Arms Control and Defense Intelligence, Senate Committee on Armed Services, July 27, 1993

Testimony of John T. Conway, Chairman, DNFSB, Hearings on DOE's Management of Environmental Cleanup at the DOE's Fernald Nuclear Facility, Subcommittee on Energy Investigations and Oversight, House Committee on Energy and Commerce, December 1, 1993

Testimony of John T. Conway, Chairman, DNFSB, Hearings on H.R. 3920, Federal Nuclear Facilities Licensing and Regulation Act, Subcommittee on Energy and Mineral Resources, House Committee on Natural Resources, March 7, 1994

Testimony of DNFSB, Hearings on DOE Atomic Energy Defense Activities, Subcommittee on Energy and Water Development, House Committee on Appropriations, March 15, 1994

Testimony of DNFSB, Hearings on FY-95 Authorizations for DOE Defense Programs, Committee on Armed Services, March 22, 1994

Testimony of John T. Conway, Chairman, DNFSB, Hearings on DOE Health and Safety Strategy, Subcommittee on Energy, House Committee on Science, Space and Technology, September 21, 1994

Activities of the Defense Nuclear Facilities Safety Board, a Report to Congress, March 28, 1990

Annual Report to Congress, Defense Nuclear Facilities Safety Board, February 1991

Annual Report to Congress, Defense Nuclear Facilities Safety Board, February 1992

Annual Report to Congress, Defense Nuclear Facilities Safety Board, April 1993

Annual Report to Congress, Defense Nuclear Facilities Safety Board, February 1994

Annual Report to Congress, Department of Energy Activities Relating to the Defense Nuclear Facilities Safety Board in 1990, March 1991

Annual Report to Congress, Department of Energy Activities Relating to the Defense Nuclear Facilities Safety Board, Second Annual Report -- Calendar Year 1991, January 1992

Annual Report to Congress, Department of Energy Activities Relating to the Defense Nuclear Facilities Safety Board, Calendar Year 1992, January 1993

Annual Report to Congress, Department of Energy Activities Relating to the Defense Nuclear Facilities Safety Board, Calendar Year 1993, February 1994

Defense Nuclear Facilities Safety Board Recommendation 90-1, "Operator Training at Savannah River Facilities Prior to Restart of K, L, and P Reactors," 55 Fed. Reg. 7022 (1990)

Defense Nuclear Facilities Safety Board Recommendation 90-2, "Design, Construction, Operation and Decommissioning Standards at Certain Priority DOE Facilities", 55 Fed. Reg. 9487 (1990)

Defense Nuclear Facilities Safety Board Recommendation 90-3, "Safety at Single-Shell Hanford Waste Tanks," 55 Fed. Reg. 11,994 (1990)

Defense Nuclear Facilities Safety Board Recommendation 90-4, "Operational Readiness Review at Rocky Flats Plant," 55 Fed. Reg. 19,644 (1990)

Defense Nuclear Facilities Safety Board Recommendation 90-5, "Systematic Evaluation Program at the Rocky Flats Plant," 55 Fed. Reg. 21,429 (1990)

Defense Nuclear Facilities Safety Board Recommendation 90-6, "Criticality Safety at Rocky Flats Plant," 55 Fed. Reg. 23,584 (1990)

Defense Nuclear Facilities Safety Board Recommendation 90-7, "Safety at the Single-Shell Hanford Waste Tanks," 55 Fed. Reg. 42,243 (1990)

Defense Nuclear Facilities Safety Board Recommendation 91-1, "Strengthening the Nuclear Safety Standards Program for DOE's Defense Nuclear Facilities," 56 Fed. Reg. 10,546 (1991)

Defense Nuclear Facilities Safety Board Recommendation 91-2, "Closure of Safety Issues Prior to Restart of K-Reactor at the Savannah River Site", 56 Fed. Reg. 13,637 (1991)

Defense Nuclear Facilities Safety Board Recommendation 91-3, "DOE's Comprehensive Readiness Review Prior to Initiation of the Test Phase at the Waste Isolation Pilot Plant," 56 Fed. Reg. 19,988 (1991)

Defense Nuclear Facilities Safety Board Recommendation 91-4, "DOE's Operational Readiness Review Prior to Resumption of Plutonium Operations at the Rocky Flats Plant," 56 Fed. Reg. 50,711 (1991)

Defense Nuclear Facilities Safety Board Recommendation 91-5, "Power Limits for K-Reactor Operation at the Savannah River Site," 56 Fed. Reg. 67,068 (1991)

Defense Nuclear Facilities Safety Board Recommendation 91-6, "Radiation Protection for Workers and the General Public at DOE Defense Nuclear Facilities," 56 Fed. Reg. 67,066 (1991)

Defense Nuclear Facilities Safety Board Recommendation 92-1, "Operational Readiness of the HB-Line at the Savannah River Site," 57 Fed. Reg. 22,732 (1992)

Defense Nuclear Facilities Safety Board Recommendation 92-2, "DOE's Facility Representative Program at Defense Nuclear Facilities," 57 Fed. Reg. 23,576 (1992)

Defense Nuclear Facilities Safety Board Recommendation 92-3, "Operational Readiness Reviews for the HB-Line at the Savannah River Site," 57 Fed. Reg. 23,578 (1992)

Defense Nuclear Facilities Safety Board Recommendation 92-4, "Multi-Function Waste Tank Facility at the Hanford Site," 57 Fed. Reg. 31,177 (1992)

Defense Nuclear Facilities Safety Board Recommendation 92-5, "Discipline of Operations in a Changing Defense Nuclear Facilities Complex," 57 Fed. Reg. 39,191 (1992)

Defense Nuclear Facilities Safety Board Recommendation 92-6, "Operational Readiness Reviews," 57 Fed. Reg. 40,181 (1992)

Defense Nuclear Facilities Safety Board Recommendation 92-7, "Training and Qualification," 57 Fed. Reg. 44,561 (1992)

Defense Nuclear Facilities Safety Board Recommendation 93-1, "Standards Utilization in Defense Nuclear Facilities," 58 Fed. Reg. 6389 (1993)

Defense Nuclear Facilities Safety Board Recommendation 93-2, "The Need for Critical Experiment Capability," 58 Fed. Reg. 16,654 (1993)

Defense Nuclear Facilities Safety Board Recommendation 93-3, "Improving DOE Technical Capability in Defense Nuclear Facilities Programs," 58 Fed. Reg. 32,109 (1993)

Defense Nuclear Facilities Safety Board Recommendation 93-4, "DOE's Management and Direction of Environmental Restoration Management Contracts," 58 Fed. Reg. 34,247 (1993)

Defense Nuclear Facilities Safety Board Recommendation 93-5, "Hanford Waste Tanks Characterization Studies," 58 Fed. Reg. 40,409 (1993)

Defense Nuclear Facilities Safety Board Recommendation 93-6, "Maintaining Access to Nuclear Weapons Expertise in the Defense Nuclear Facilities Complex," 58 Fed. Reg. 68,123 (1993)

Defense Nuclear Facilities Safety Board Recommendation 94-1, "Improved Schedule for Remediation in the Defense Nuclear Complex," 59 Fed. Reg. 28,848 (1994)

Defense Nuclear Facilities Safety Board Recommendation 94-2, "Conformance With Safety Standards at DOE Low-Level Nuclear Waste and Disposal Site," 59 Fed. Reg. 47,309 (1994)

Defense Nuclear Facilities Safety Board Recommendation 94-3, "Rocky Flats Seismic and Systems Safety," 59 Fed. Reg. 50,581 (1994)

Defense Nuclear Facilities Safety Board Recommendation 94-4, "Deficiencies in Criticality Safety at Oak Ridge Y-12 Plant," 59 Fed. Reg. 50,732 (1994)

Defense Nuclear Facilities Safety Board Recommendation 94-5, "Integration of DOE Safety Rules, Orders, and Other Requirements," 60 Fed. Reg. 2089 (1995)

Transcript of Defense Nuclear Facilities Safety Board public hearing held for Rocky Flats Environmental Technology Site, October 4, 1994

Transcript of Defense Nuclear Facilities Safety Board public hearing held for Idaho National Engineering Laboratory, October 6, 1994

Transcript of Defense Nuclear Facilities Safety Board public hearing held for Fernald Environmental Management Project and Mound Plant, October 12, 1994

Transcript of Defense Nuclear Facilities Safety Board public hearing held for Hanford Site, October 25, 1994

Transcript of Defense Nuclear Facilities Safety Board public hearing held for Sandia National Laboratory, Los Alamos National Laboratory and WIPP, October 27, 1994

Transcript of Defense Nuclear Facilities Safety Board public hearing held for Oak Ridge Reservation, November 1, 1994

Transcript of Defense Nuclear Facilities Safety Board public hearing held for Savannah River Site, November 3, 1994

Transcript of Defense Nuclear Facilities Safety Board public hearing held for Pantex, October 19, 1994

Transcript of Defense Nuclear Facilities Safety Board public hearing with Secretary of Energy, December 6, 1994

Letter to General Counsel from Administrative Conference of the United States, dated January 2, 1991 regarding suggestions on the Board's draft proposed rules under the Government in the Sunshine Act

Memorandum to Secretarial Officers and Managers of Field Elements from Secretary O'Leary dated December 2, 1994, "Major Initiative on Nuclear Safety Accountability"

Memorandum for Heads of Headquarters and Field Elements from Secretary O'Leary dated February 9, 1994, "Compliance With Department of Energy Orders"

Memorandum to DOE Operations Offices from V. Reis dated May 27, 1994, regarding Defense Programs Implementation Guidance for the Final Rule on Occupational Radiation Exposure

Memorandum to J. Fitzgerald from M.S. Dienes dated November 30, 1994, regarding Environmental, Safety and Health (ES&H) Assessment Schedule

Defense Nuclear Facilities Safety Board letter to Secretary O'Leary dated May 6, 1994

Letter to John Conway from Hazel O'Leary dated October 21, 1994, "U.S. Department of Energy Response to Defense Nuclear Facilities Safety Board Letter of May 6, 1994"

Letter to John Conway from Hazel O'Leary dated December 9, 1994 forwarding prepared testimony for December 6, 1994 public hearing at the Defense Nuclear Facilities Safety Board

Letter to John Conway from M.B. Whitaker (DOE Departmental Representative to the Defense Nuclear Facilities Safety Board) dated December 8, 1994 forwarding organizational charts for the Office of Environment, Safety and Health

Standards and Requirements Identification Document (S/RID), Solid Waste Disposal Division, Westinghouse Hanford Company, IP-1120, Rev. 0, November 30, 1994

DOE Request for Proposal, DE-RP34-94RF00825, Rocky Flats, July 12, 1994

Reactor Accidents: Nuclear Safety and the Role of Institutional Failure, David Mosey, Nuclear Engineering International Special Publications (1990)

The Technology of Nuclear Safety, Volume 1, T.J. Thompson and J.G. Beckerely, Massachusetts Institute of Technology (1964)

Report of the President's Commission on the Accident at Three Mile Island, John G. Kenemy, et al., U.S. Government Printing Office, Washington (1979)

Three Mile Island: A Report to the Commissioners and to the Public , Vol. I and II, Pt. 1, 2, and 3, NUREG/CR-1250, M. Rogovin, Director, Nuclear Regulatory Commission Special Inquiry Group, U.S. Nuclear Regulatory Commission

Action Plan Developed as a Result of the TMI Accident, NUREG-0660, U.S. Nuclear Regulatory Commission (1980)

Clarification of TMI Action Plan Requirements, NUREG-0737 U.S. Nuclear Regulatory Commission (1980)

TMI-Related Requirements for New Operating Licenses, NUREG-0694, U.S. Nuclear Regulatory Commission (1980)

Guidelines for Utility Management Structure and Technical Resources (Draft Report for Interim Use and Comment), NUREG-0731, U.S. Nuclear Regulatory Commission (1980)

An Assessment of the GPU Nuclear Corporation and Senior Management and Its Competence to Operate TMI-1, Admiral H.G. Rickover, USN (November 19, 1983)

Standard Review Plan, NUREG-0800, U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (1989)

Standard Review Plan, NUREG-0800, U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation (1989)

Standard Review Plan for Low-Level Waste Disposal Licensing Program, NUREG-1200, U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards (1994)

Proposed Method for Regulating Major Materials Licensees, NUREG-1324, U.S. Nuclear Regulatory Commission (1992)

Safety Culture, A Report by the International Nuclear Safety Advisory Group, International Atomic Energy Agency Safety Series No. 75-INSAG-4 (1991)

Basic Safety Principles for Nuclear Power Plants, A Report by the International Nuclear Safety Advisory Group, International Atomic Energy Agency Safety Series No. 75-INSAG-3 (1988)

A Safety Assessment of Department of Energy Nuclear Reactors (Crawford Report), DOE/US-0005, U.S. Department of Energy (1981)

Safety Issues at the Defense Production Reactors, National Research Council, National Academy Press (October 1987)

Autonomy, Independence, and Social Control; NASA and the Space Shuttle Challenger, Diane Vaughan, Administrative Science Quarterly, 35 (1990):225-257

Promoting a Change in Safety Culture: Selin's View, Nuclear Engineering International, Vol 39, No. 480, July 1994

Report of the Presidential Commission on the Space Shuttle Challenger Accident, Washington D.C., June 6, 1986

The Nuclear Weapons Complex: Management for Health, Safety, and the Environment, National Research Council, National Academy Press (1989)

Status of DOE's Reorganization of Its Safety Oversight Function, GAO/RCED-90-82BR, United States General Accounting Office (1990)

Management Reform: Implementation of the National Performance Review's Recommendations, GAO/OCG 95-1, United States General Accounting Office (1994)

Nuclear Health and Safety: Consensus on Acceptable Radiation Risk to the Public is Lacking, GAO/RCED 94-190, United States General Accounting Office (1994)

Nuclear Cleanup: Completion of Standards and Effectiveness of Land Use Planning are Uncertain, GAO/RCED 94-144, United States General Accounting Office (1994)

Testimony, Managing DOE: Government Property Worth Millions of Dollars is Missing, GAO/T-RCED 94-309, United States General Accounting Office (1994)

Energy Management: DOE's Efforts to Manage Overtime Costs Have Been Limited, GAO/RCED 94-282, United States General Accounting Office (1994)

Nuclear Waste: Comprehensive Review of the Disposal Program is Needed, GAO/RCED 94-299, United States General Accounting Office (1994)

Testimony, Health and Safety: Protecting Workers and the Public Continues to Challenge DOE, GAO/T-RCED 94-283, United States General Accounting Office (1994)

Nuclear Waste: Foreign Countries' Approaches to High-Level (HLW) Storage and Disposal, GAO/RCED 94-172, United States General Accounting Office (1994)

DOE: Management Changes Needed to Expand Use of Innovative Cleanup Technologies, GAO/RCED 94-205, United States General Accounting Office (1994)

Nuclear Regulation: Action Needed to Control Radioactive Contamination at Sewage Treatment Plants, GAO/RCED 94-133, United States General Accounting Office (1994)

Nuclear Safety: Unresolved Issues Could Impair DOE's Oversight Effectiveness, GAO/RCED 94-129, United States General Accounting Office (1994)

Department of Energy: Status of DOE's Property Management Program, GAO/RCED 94-154FS, United States General Accounting Office (1994)

Nuclear Waste: Much Effort Needed to Meet Federal Facility Compliance Act's Requirements, GAO/RCED 94-179, United States General Accounting Office (1994)

DOE: Challenges to Implementing Contract Reform, GAO/RCED 94-150, United States General Accounting Office (1994)

Energy Management: Inadequate DOE Monitoring of Contractor's Acquisitions From Affiliates, GAO/RCED 94-83, United States General Accounting Office (1994)

DOE: The Property Management System at Rocky Flats is Inadequate, GAO/RCED 94-77, United States General Accounting Office (1994)

Health and Safety: DOE's Implementation of a Comprehensive Health Surveillance Program is Slow, GAO/RCED 94-47, United States General Accounting Office (1994)

Testimony, DOE's National Laboratories: Adopting New Missions and Managing Effectively Pose Significant Challenges, GAO/T-RCED 94-113, United States General Accounting Office (1994)

Energy Management: Control Over the Livermore Laboratory's Indirect Costs are Inadequate, GAO/RCED 94-34, United States General Accounting Office (1994)

Nuclear Science: Developing Technology to Reduce Radioactive Waste May Take Decades and Be Costly, GAO/RCED 94-16, United States General Accounting Office (1994)

DOE Management: Funds for Maintaining Contractor's Operations Could be Reduced and Better Controlled, GAO/RCED 94-27, United States General Accounting Office (1994)

Nuclear Waste: Funds Spent to Identify a Monitored Retrievable Storage Facility Site, GAO/RCED 93-199, United States General Accounting Office (1993)

Nuclear Health and Safety: Examples of Post-World War II Radiation Releases at U.S. Nuclear Sites, GAO/RCED 94-51FS, United States General Accounting Office (1993)

Testimony, DOE Management: Implementing the Environmental Restoration Management Contractor Concept, GAO/T-RCED 94-86, United States General Accounting Office (1993)

Nuclear Weapons: Safety, Technical and Manpower Issues Slow DOE's Disassembly Efforts, GAO/RCED 94-9, United States General Accounting Office (1993)

Energy Management: Additional Uncosted Balances Could Be Used To Meet Future Budget Needs, GAO/RCED 94-26, United States General Accounting Office (1993)

Nuclear Waste: Overhead Costs at the DOE's Savannah River Site, GAO/RCED 94-13FS, United States General Accounting Office (1993)

Testimony, Safety and Health: Worker Safety and Health Oversight Issues Facing DOE, GAO/T-RCED 94-54, United States General Accounting Office (1993)

Nuclear Materials: Nuclear Arsenal Reductions Allow Consideration of Tritium Production Options, GAO/RCED 93-189, United States General Accounting Office (1993)

DOE Management: Consistent Cleanup Indemnification Policy is Needed, GAO/RCED 93-167, United States General Accounting Office (1993)

Department of Energy: Management Problems Require a Long-Term Commitment to Change, GAO/RCED 93-72, United States General Accounting Office (1993)

Nuclear Regulation: Cleanup Delays at Two Radioactive Waste Sites in Ohio, GAO/RCED 93-156, United States General Accounting Office (1993)

Department of Energy: Cleaning Up Inactive Facilities Will Be Difficult, GAO/RCED 93-149, United States General Accounting Office (1993)

Nuclear Regulation: NRC's Nuclear Materials Program Needs Improvement to Protect Public Health and Safety, GAO/RCED 93-51, United States General Accounting Office (1993)

Nuclear Waste: Yucca Mountain Project Management and Funding Issues, GAO/T-RCED 93-58, United States General Accounting Office (1993)

Safety and Health: Key Independent Oversight Program at DOE Needs Strengthening, GAO/RCED 93-85, United States General Accounting Office (1993)

Nuclear Regulation: Better Criteria and Data Would Help Ensure Safety of Nuclear Materials, GAO/RCED 93-90, United States General Accounting Office (1993)

Nuclear Waste: Yucca Mountain Project Behind Schedule and Facing Major Scientific Uncertainties, GAO/RCED 93-124, United States General Accounting Office (1993)

Nuclear Waste: Hanford Tank Waste Program Needs Cost, Schedule, and Management Changes, GAO/RCED 93-99, United States General Accounting Office (1993)

Energy Issues: Transition Series, GAO/OCG 93-13TR, United States General Accounting Office (1992)

Nuclear Security: Safeguards and Security Planning at DOE Facilities Incomplete, GAO/RCED 93-14, United States General Accounting Office (1992)

Nuclear Security: Improving Security Deficiencies at DOE's Weapons Facilities, GAO/RCED 93-10, United States General Accounting Office (1992)

DOE: Project Management at Rocky Flats Plant Needs Improvement, GAO/RCED 93-32, United States General Accounting Office (1992)

DOE: Better Information Resources Management Needed to Accomplish Missions, GAO/IMTEC 92-53, United States General Accounting Office (1992)

Nuclear Materials: Removing Plutonium Residues From Rocky Flats Plant Will Be Difficult and Costly, GAO/RCED 92-219, United States General Accounting Office (1992)

Nuclear Waste: Improvements Needed In Monitoring Contaminants In Hanford Soils, GAO/RCED 92-149, United States General Accounting Office (1992)

DOE Management: Impediment to Environmental Restoration Management Contracting, GAO/RCED 92-244, United States General Accounting Office (1992)

Nuclear Science: Consideration of Accelerator Production of Tritium Requires R&D, GAO/RCED 92-154, United States General Accounting Office (1992)

Nuclear Waste: Defense Waste Processing Facility (DWPF)- Cost, Schedule, and Technical Issues, GAO/RCED 92-183, United States General Accounting Office (1992)

Nuclear Waste: Questionable Uses of Program Funds at Lawrence Livermore Laboratory, GAO/RCED 92-157, United States General Accounting Office (1992)

Nuclear Health and Safety: More Can Be Done To Better Control Environmental Restoration Costs, GAO/RCED 92-71, United States General Accounting Office (1992)

Cleanup Technology: Better Management for DOE's Technology Development Program, GAO/RCED 92-145, United States General Accounting Office (1992)

Testimony, Nuclear Weapons Complex: GAO's Views of Reconfiguring the Complex, GAO/T-RCED 92-49, United States General Accounting Office (1992)

Testimony, Cleanup Technology: DOE's Management of Environmental Cleanup Technology, GAO/T-RCED 92-29, United States General Accounting Office (1992)

Nuclear Waste: Weak DOE Contract Management Invited TRUPAC-II Setbacks, United States General Accounting Office (1992)

Fact Sheet, Nuclear Health and Safety: Radiation Events at DOE's Idaho National Engineering Laboratory (INEL), GAO/RCED 92-64FS, United States General Accounting Office (1992)

Nuclear Weapons Complex: Major Safety, Environmental, and Reconfiguration Issues Facing DOE, GAO/T-RCED 92-31, United States General Accounting Office (1992)

Nuclear Security: Property Control Problems at DOE's Livermore Laboratory Continue, GAO/RCED 91-141, United States General Accounting Office (1991)

Nuclear Science: Accelerator Technology for Tritium Production Needs Further Study, GAO/RCED 92-1, United States General Accounting Office (1991)

Nuclear Health and Safety: Environmental, Health and Safety Practices at Naval Reactor Facilities, GAO/RCED 91-157, United States General Accounting Office (1991)

Uranium Enrichment: DOE Needs to Pursue Alternative 'Alvis' Deployment Options, GAO/RCED 91-88, United States General Accounting Office (1991)

Nuclear Safety and Health: Environmental Problems at DOE's Idaho National Engineering Laboratory, GAO/RCED 91-56, United States General Accounting Office (1991)

Nuclear Waste: Hanford Single-Shell Tank Leaks Greater Than Estimated, GAO/RCED 91-177, United States General Accounting Office (1991)

Nuclear Safety: Potential Security Weaknesses at Los Alamos and Other DOE Facilities, GAO/RCED 91-12, United States General Accounting Office (1990)

Nuclear Safety and Health: Counterfeit and Substandard Products are a Government-Wide Concern, GAO/RCED 91-16, United States General Accounting Office (1990)

Testimony, Nuclear Waste: Delays in Addressing Environmental Requirements and New Safety Concerns Affect DOE's Waste Isolation Pilot Plant (WIPP), GAO/T-RCED 91-67, United States General Accounting Office (1990)

Nuclear Waste: Problems Associated With DOE's Inactive Waste Sites, GAO/RCED 88-189, United States General Accounting Office (1988)

Nuclear Health and Safety: Dealing With Problems in the Nuclear Defense Complex Expected to Cost Over $100 Billion, GAO/RCED 88-197BR, United States General Accounting Office (1988)

Nuclear Safety: The Defense Nuclear Facilities Safety Board's First Year of Operation, GAO/RCED 91-54, United States General Accounting Office (1991)

Nuclear Health and Safety: Oversight at DOE's Nuclear Facilities Can Be Strengthened, GAO/RCED 88-137, United States General Accounting Office (1988)

Testimony, Key Elements of Effective Independent Oversight of DOE's Nuclear Facilities, GAO/T-RCED 88-6, United States General Accounting Office (1987)

Nuclear Waste: Unresolved Issues Concerning Hanford's Waste Management Practices, GAO/RCED 87-30, United States General Accounting Office (1986)

Nuclear Energy: Environmental Issues at DOE's Defense Nuclear Facilities, GAO/RCED 86-192, United States General Accounting Office (1986)

Nuclear Safety: Comparison of DOE's Hanford N-Reactor with the Chernobyl Reactor, GAO/RCED 86-213BR, United States General Accounting Office (1986)

Nuclear Waste: Impact of Savannah River Plant's Radioactive Waste Management Practices, GAO/RCED 86-143, United States General Accounting Office (1986)

Nuclear Energy: A Compendium of Relevant GAO Products on Regulation, Health and Safety, GAO/RCED 86-132, United States General Accounting Office (1986)

Nuclear Waste: Department of Energy's Transuranic Waste Disposal Plan Needs Revision, GAO/RCED 86-90, United States General Accounting Office (1986)

Nuclear Safety: Safety Analysis Reviews for DOE's Defense Facilities Can be Improved, GAO/RCED 86-175, United States General Accounting Office (1986)

Environment, Safety and Health: Status of Department of Energy's Implementation of 1985 Initiatives, GAO/RCED 86-68FS, United States General Accounting Office (1986)

Environment, Safety and Health: Environment and Workers Could Be Better Protected at Ohio Defense Plants, GAO/RCED 86-61, United States General Accounting Office (1985)

DOE's Plutonium Facility, GAO/RCED 85-3, United States General Accounting Office (1985)

Department of Energy Acting to Control Hazardous Waste At Its Savannah River Nuclear Facilities, GAO/RCED 85-23, United States General Accounting Office (1984)

DOE's Safety and Health Oversight Program At Nuclear Facilities Could Be Strengthened, GAO/RCED 84-50, United States General Accounting Office (1983)

Decommissioning Retired Nuclear Reactors At Hanford Reservation, GAO/RCED 83-104, United States General Accounting Office (1983)

Cleaning Up Nuclear Facilities- An Aggressive and Unified Federal Program Is Needed, GAO/EMD 82-40, United States General Accounting Office (1982)

GAO's Response to DOE on EMD-81-108, "Better Oversight Needed for Safety and Health Activities at DOE's Nuclear Facilities, GAO/EMD 82-36, United States General Accounting Office (1982)

Congress Should Increase Financial Protection to the Public From Accidents at DOE Nuclear Operations, GAO/EMD 81-111, United States General Accounting Office (1981)

Better Oversight Needed for Safety and Health Activities At DOE's Nuclear Facilities, GAO/EMD 81-108, United States General Accounting Office (1981)

Department of Energy's Safety and Health Program for Enrichment Plant Workers Is Not Adequately Implemented, GAO/EMD 80-78, United States General Accounting Office (1980)

Decommissioning the Hanford Reactor, GAO/EMD 79-20, United States General Accounting Office (1979)

Cleaning Up the Department of Energy's Nuclear Weapons Complex, Congress of the United States Congressional Budget Office (1994)

Complex Cleanup, Office of Technology Assessment

APPENDIX C

POLICY STATEMENT NO. 1

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Criteria for Judging the Adequacy of DOE Responses and Implementation Plans for DNFSB Recommendations

AGENCY: Defense Nuclear Facilities Safety Board.

ACTION: Notice of Board adoption of policy guidance.

SUMMARY: The Defense Nuclear Facilities Safety Board has unanimously adopted a policy statement which establishes the criteria that the Board will use for judging the adequacy of Department of Energy (DOE) responses to, and implementation plans for, Board recommendations.

FOR FURTHER INFORMATION CONTACT: Robert M. Andersen, General Counsel, Defense Nuclear Facilities Safety Board, 625 Indiana Avenue, NW., Suite 700, Washington, DC 20004, (202) 208–6387.

SUPPLEMENTARY INFORMATION: The Defense Nuclear Facilities Safety Board issues recommendations to the Secretary of the Department of Energy and to the President regarding public health and safety at DOE's defense nuclear facilities. The Board's enabling statute requires the Secretary of energy to either accept or reject Board recommendations and to subsequently develop implementation plans for those portions of Board recommendations which are accepted. The Board has now received DOE responses to six of the first seven recommendations made to the Secretary and has reviewed the first five implementation plans submitted by DOE..

This Defense Nuclear Facilities Safety Board Policy Statement (PS–1), the Board's first, will guide the board and its staff in evaluating the adequacy of DOE responses and implementation plans, as well as assist the Board in structuring appropriate follow-up action in the event a recommendation is not fully or adequately addressed in DOE's response and implementation plan. Furthermore, the statement formally identifies, for the benefit of DOE and the public, the Board's expectations regarding the elements the Board believes are necessary for an adequate response and implementation plan.

Policy Statement

Criteria for Judging the Adequacy of DOE Responses and Implementation Plans for DNFSB Recommendations

The Board's authorizing statute requires the Secretary of Energy to respond to each Board recommendation and to subsequently prepare an implementation plan for those portions of the recommendation that DOE accepts. The statute allows the Board to use its discretion and judgment in assessing the adequacy of DOE responses and implementation plans.

I. Evaluating DOE Responses

The statute requires the Secretary of Energy to "transmit his response to the Board within 45 days after the date of publication [in the Federal Register] * * * of the notice with respect to such recommendation or within such additional period, not to exceed 45 days, as the Board may grant." The Act anticipates responses which accept the Board's recommendations, and responses which reject the Board's recommendations, in whole or in part. As we have already learned from DOE's responses to the Board's first six recommendations, however, there is a whole range of possible written responses that the Board must prepared to deal with in the future.

For example, DOE may choose to rely upon a response letter which simply states that the Secretary agrees with or accepts a recommendation of the Board. Such action constitutes an unconditional acceptance of the Board's recommendation, and acquiesces in the Board's interpretation of the recommendation's terms and requirements. Any subsequent contradiction or retrenchment for the response's unconditional acceptance in the implementation plan will ordinarily be unacceptable to the Board. Therefore, it is far preferable to air any real differences that DOE may have with the recommendation in the response itself. Moreover, preliminary discussions between the Board, its staff, and DOE prior to the Secretary's issuance of a final response can avoid confusion, disputes, misunderstanding, and wasted effort later in the process.

It should be noted that a response which rejects portions of a recommendation may be an adequate response if, in the Board's judgment, sound reasons are given for rejecting the recommendation, and alternative means of protecting public health and safety are specified. On the other hand, an evasive, nonresponsive, ambiguous, or unclear response which is labeled an acceptance by DOE is not adequate. The Board recognizes that a flawed response, if left uncorrected, will only lead to further problems in the implementation plan.

The following types of DOE responses may be encountered by the Board:

1. A response which says it is an acceptance, but by its language or terms in fact rejects part of the recommendation.
2. Ambiguous responses that could be interpreted either as acceptance or rejection of the recommendation.
3. Failure to address certain issues.
4. Unqualified rejection of the entire recommendation.
5. Silence, or no response.
6. Unconditional acceptance of the entire recommendation consistent with the terms set by the Board.

Comparing DOE responses against this list of response types will assist the Board in sorting out actual DOE acceptances from rejections. A valid acceptance is filed in a timely manner and exhibits three key features: (1) an understanding of what is being asked or recommended; (2) a commitment by DOE to take action to meet the recommendation; and (3) specification of what DOE intends to do so that the Board can determine if all material terms of the recommendation will be met, rather than avoided.

DOE's response need not be detailed or long, provided the Board is satisfied that DOE understands what is being asked and intends to accomplish the recommended action in a timely manner. If a response satisfies the above three requirements, however, it need not present the details of how and when the recommendation will be met—that is the purpose of the implementation plan.

II. Evaluating DOE's Implementation Plan

As with responses, the statute, for the most part, gives the Board discretion to use its judgment in assessing the adequacy of implementation plans. The statutory language expresses one major substantive measure of an implementation plan's effectiveness, which is perhaps self-evident. Since the Secretary must ordinarily "carry out" and "complete" implementation in one year, it necessarily follows that the plan must schedule, and otherwise assure,

that action is taken to accomplish the recommendation. The statute also imposes two procedural requirements. First, the Secretary must "transmit the implementation plan to the Board within 90 days after the date" of the Secretary's final decision on the recommendation. If additional time is necessary to write the plan, the Secretary may take an additional 45 days, provided he submits the reasons for the delay to the appropriate congressional commmittees. Second, if the Secretary cannot carry out and complete the implementation plan within one year, he must report the reasons for the delay to the appropriate congressional committees.

The purpose of the implementation plan is to provide a basis and a schedule for assuring that accepted recommendations are accomplished.

A. Substantive Criteria

1. Does DOE understand the Board's recommendation?

DOE's responses give the first indication of whether or not the Board's recommendations have been communicated and understood. If a respose is adequate, the implementation plan should track the response in this regard and clearly demonstrate an understanding of the recomendation. If there is a clear restatement by DOE in the implementation plan of the recommendation's goals, or of the underlying issues or problems identified by the recommendation, the Board can then reasonably assume that its initial recommendation was understood. DOE, however, maintains latitude to implement recommendations in a wide variety of ways so long as the Board's recommendations are achieved. Ultimately, the totality of all the terms of the plan will exhibit the level of DOE's understanding and acceptance of the recommendation.

2. What does DOE intend to do to accomplish the recommendation?

A clear acceptance of the Board's recommendation in DOE's response is the initial indicator that DOE is committed to achieving the recommended action. On the other hand, if an initial implementation plan incorporates a response which does not signal DOE's intent to fully meet the recommendation, the Board has grounds for serious concern. A specific description of DOE's intended course of action, in the implementation plan itself, is the best indicator of whether DOE is committed to the accomplishment of the recommendation. Such a description can also resolve questions raised by ambiguous or unclear DOE responses, and clarify how DOE has chosen to interpret the recommendation.

If DOE's response meets the terms of the recommendation, and that response is incorporated in the implementation plan by reference, or restated, the Board has reason to believe that DOE intends to comply. That intent must be confirmed, however, by a full review of the details of how DOE plans to accomplish the recommendation.

3. What are DOE's baseline assumptions?

The depth and type of baseline assumptions can vary greatly depending on the recommendation. Most implementation plans will be based on engineering or technical assumptions. Some implementation plans, if not all, will embrace administrative and legislative assumptions also, i.e. compliance provided sufficient funds are appropriated. Important assumptions should be presented in the plan.

4. Has DOE adequately outlined its approach?

DOE's approach must be outlined in sufficient detail to enable the Board to independently assess the approach without doing the underlying work. The plan should address the questions of how the goals relating to safety will be achieved and maintained. The Board should be able to assess whether the approach is reasonable and achievable within the specified time period.

5. Has DOE adequately justified a course of action proposed in the implementation plan?

The plan should contain a sound evaluation of the problem first identified in the recommendation, including a root cause analysis (or summary thereof), so that it is clear why DOE is taking the proposed action. The causes of any technical problems should be identified, when appropriate, not just the administrative controls (or lack thereof) that allowed the situation to occur. Reasons should be given for agreeing with the recommendation, based on DOE's own analysis.

6. Has the plan truly called for completion or closure?

The plan should clearly provide a method for demonstrating completion or closure in a manner that can be easily verified by the Board.

B. Procedural Requirements

1. Has DOE submitted the plan to the Board in accordance with statutory deadlines?

2. Has DOE established a realistic and achievable schedule for completion?

Final deadlines, as well as intermediary milestones or checks and deliverables with measures of accomplishment, should be identified in the implementation plan.

3. Has DOE adequately provided for implementation course corrections or process change in appropriate cases?

Complex, long range plans must be flexible enough to accommodate change if necessary. A process should be defined for configuration management or change control so that the proposed action can be modified if additional information dictates, or changes in the assumptions occur.

4. Has DOE provided for quality assurance in appropriate cases?

The Board may require a plan to specify how the qualify of the proposed action will be assured. Quality issues include qualifications of people involved, internal checks on the implementation as the task is completed, final verification, independent oversight, and chain of custody on records, samples, other critical data and documentation.

5. Does the Plan provide for adequate reporting in appropriate cases?

A reporting scheme and schedule should be specified to assure the Board remains informed of the status of the progress and any new related issues that may appear.

John T. Conway,

Chairman.

Appendix—Transmittal Letter to the Secretary of Energy

October 19, 1990.

The Honorable James D. Watkins, Secretary of Energy, Washington, DC 20585

Ref: DNFSB Policy Statement No. 1: Criteria for Judging the Adequacy of DOE Responses and Implementation Plans

Dear Mr. Secretary: Enclosed please find policy criteria which the Board unanimously adopted for judging the adequacy of DOE responses and implementation plans for Board recommendations. We have previously circulated draft criteria with DOE staff responsible for preparing responses and implementation plans. The use of the criteria, together with the close cooperation of DOE and Board staff, have resulted in more complete and sound responses and implementation plans.

Sincerely,
John T. Conway,
Chairman.
[FR Doc. 90-25507 Filed 10-26-90; 8:45 am]
BILLING CODE 6820-KD-M

APPENDIX D

DOE SAFETY ORDERS OF INTEREST TO THE BOARD

DOE Order 1300.2A, "Department of Energy Technical Standards Program"

DOE Order 1360.2B, "Unclassified Computer Security Program"

DOE Order 1540.2, "Hazardous Material Packaging for Transport - Administrative Procedures"

DOE Order 1540.3, "Base Technology for Radioactive Material Transportation Packaging Systems"

DOE Order 4330.4B, "Maintenance Management Program"

DOE Order 4700.1, "Project Management System"

DOE Order 5000.3B, "Occurrence Reporting and Processing of Operations Information"

DOE Order 5400.1, "General Environmental Protection Program"

DOE Order 5400.2A, "Environmental Compliance Issue Coordination"

DOE Order 5400.3, "Hazardous and Radioactive Mixed Waste Program"

DOE Order 5400.4, "Comprehensive Environmental Response, Compensation, and Liability Act Requirements"

DOE Order 5400.5, "Radiation Protection of the Public and the Environment"

DOE Order 5440.1E, "National Environmental Policy Act Compliance Program"

DOE Order 5480.1B, "Environment, Safety and Health Program"

DOE Order 5480.3, "Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances and Hazardous Wastes"

DOE Order 5480.4, "Environmental Protection, Safety and Health Protection Standards"

DOE Order 5480.5, "Safety of Nuclear Facilities"

DOE Order 5480.6, "Safety of DOE-Owned Nuclear Reactors"

DOE Order 5480.7A, "Fire Protection"

DOE Order 5480.8A, "Contractor Occupational Medical Program"

DOE Order 5480.9, "Construction Safety and Health Program"

DOE Order 5480.10, "Contractor Industrial Hygiene Program"

DOE Order 5480.11, "Radiation Protection for Occupational Workers"

DOE Order 5480.15, "Department of Energy Laboratory Accreditation Program for Personnel Dosimetry"

DOE Order 5480.17, "Site Safety Representatives"

DOE Order 5480.18A, "Accreditation of Performance-Based Training for Category A Reactors and Nuclear Facilities"

DOE Order 5480.19, "Conduct of Operations Requirements for DOE Facilities"

DOE Order 5480.20, "Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities"

DOE Order 5480.21, "Unreviewed Safety Questions"

DOE Order 5480.22, "Technical Safety Requirements"

DOE Order 5480.23, "Nuclear Safety Analysis Reports"

DOE Order 5480.24, "Nuclear Criticality Safety"

DOE Order 5480.25, "Safety of Accelerator Facilities"

DOE Order 5480.26, "Performance Indicators"

DOE Order 5480.28, "Natural Phenomena Hazards"

DOE Order 5480.29, "Employee Concerns"

DOE Order 5480.30, "Reactor Design Criteria"

DOE Order 5481.1B, "Safety Analysis and Review"

DOE Order 5482.1B, "Environment, Safety, and Health Appraisal Program"

DOE Order 5483.1A, "Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities"

DOE Order 5484.1, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements"

DOE Order 5500.1B, "Emergency Management System"

DOE Order 5500.2B, "Emergency Categories, Classes, and Notification and Reporting Requirements"

DOE Order 5500.3A, "Planning and Preparedness for Operational Emergencies"

DOE Order 5500.4A, "Public Affairs Policy and Planning Requirements for Emergencies"

DOE Order 5500.7B, "Emergency Operating Records Protection Program"

DOE Order 5500.10, "Emergency Readiness Assurance Program"

DOE Order 5632.11, "Physical Protection of Unclassified, Irradiated Reactor Fuel in Transit"

DOE Order 5700.6C, "Quality Assurance"

DOE Order 5820.2A, "Radioactive Waste Management"

DOE Order 6430.1A, "General Design Criteria"

DOE Order 5480.31, "S/U and Restart of Nuclear Facilities"