The Secretary of Energy
Washington, DC 20585

January 19, 1993

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, N.W., Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

Section 316(b) of the Atomic Energy Act of 1954 (42 U.S.C. 2286e(b)) requires the Department of Energy (DOE) to submit a written report to Congress concerning the activities of DOE with regard to recommendations received from the Defense Nuclear Facilities Safety Board (DNFSB). This report is submitted at the same time that the President submits the Budget to Congress. I am pleased to enclose for your information the Department's annual report for calendar year 1992.

The Department has made significant progress in improving the safety culture throughout the DOE defense nuclear complex through the dedicated efforts by both DOE and contractor personnel, in order to assure the safety of the public and workers and the protection of the environment. Interactions with the DNFSB have been especially helpful in bringing about this change. The Department is committed to cooperate fully with the DNFSB and provide unfettered access to all defense nuclear facilities. As an indication of this commitment, during 1992 alone the Department supported over 250 meetings and visits by the DNFSB and its staff.

In calendar year 1992, the Board issued seven Recommendations to DOE. I accepted, in whole, all seven of the Recommendations and am implementing corrective action or developing Implementation Plans for each. Progress continues to be made in completing actions required under the Implementation Plans for seven outstanding Recommendations issued prior to 1992. Completion of the Implementation Plans for these Recommendations will require multi-year efforts. In addition, the Department concluded all actions necessary to implement six Recommendations in 1992.

Sincerely,

James D. Watkins
Admiral, U.S. Navy (Retired)

Enclosure

Identical letter sent to:

The Honorable Thomas S. Foley
Speaker of the House of Representatives
Washington, D.C. 20515

The Honorable Robert H. Michel
Minority Leader
U.S. House of Representatives
Washington, D.C. 20515

The Honorable William H. Natcher
Chairman
Committee on Appropriations
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Joseph M. McDade
Ranking Minority Member
Committee on Appropriations
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Ron Dellums
Chairman
Committee on Armed Services
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Floyd Spence
Ranking Minority Member
Committee on Armed Services
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Dan Quayle
President of the Senate
Washington, D.C. 20510

The Honorable George Mitchell
Majority Leader
United States Senate
Washington, D.C. 20510

The Honorable Robert Dole
Minority Leader
United States Senate
Washington, D.C. 20510

The Honorable Sam A. Nunn
Chairman
Committee on Armed Services
United States Senate
Washington, D.C. 20510

The Honorable Strom Thurmond
Ranking Minority Member
Committee on Armed Services
United States Senate
Washington, D.C. 20510

The Honorable Robert C. Byrd
Chairman
Committee of Appropriations
United States Senate
Washington, D.C. 20510

The Honorable Mark O. Hatfield
Ranking Minority Member
Committee on Appropriations
United States Senate
Washington, D.C. 20510

The Honorable J. James Exon
Chairman
Subcommittee on Strategic Forces and Nuclear Deterrence
Committee on Armed Services
United States Senate
Washington, D.C. 20510

The Honorable Strom Thurmond
Ranking Minority Member
Subcommittee on Strategic Forces and Nuclear Deterrence
Committee on Armed Services
United States Senate
Washington, D.C. 20510

[Letter sent as Ranking Minority Member of the Committee]

The Honorable John M. Spratt, Jr.
Chairman
Department of Energy Defense Nuclear Facilities Panel
Committee on Armed Services
U.S. House of Representatives
Washington, D.C. 20515

The Honorable John Kyl
Ranking Minority Member
Department of Energy Defense Nuclear Facilities Panel
Committee on Armed Services
U.S. House of Representatives
Washington, D.C. 20515

The Honorable J. Bennett Johnston
Chairman
Subcommittee on Energy and Water Development
Committee on Appropriations
United States Senate
Washington, D.C. 20510

The Honorable Mark O. Hatfield
Ranking Minority Member
Subcommittee on Energy and Water Development
Committee on Appropriations
United States Senate
Washington, D.C. 20510

[letter sent as Ranking Minority Member of the Committee]

The Honorable Tom Bevill
Chairman
Subcommittee on Energy and Water Development
Committee on Appropriations
U.S. House of Representatives
Washington, D.C. 20515

The Honorable John T. Myers
Ranking Minority Member
Subcommittee on Energy and Water Development
Committee on Appropriations
U.S. House of Representatives
Washington, D.C. 20515

ANNUAL REPORT
TO CONGRESS

Department of Energy Activities

Relating to the

Defense Nuclear Facilities Safety Board

Calendar Year 1992

January 1993

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Prologue

As 1992 ends, the Department looks with pride on the significant progress that has been made in improving the safety culture at Department of Energy nuclear facilities. Through discipline and perseverance the many men and women that contribute to the daily operations of the defense nuclear facilities have instilled a new culture within the complex that will assure the safety of the public and the workers and the protection of the environment. There is more work to be done, but the infrastructure for the new safety culture has been established.

Executive Summary

This is the third Annual Report to the Congress by the U.S. Department of Energy, hereafter referred to as "DOE" or "the Department", on its activities relating to its interactions with the Defense Nuclear Facilities Safety Board (DNFSB). The DNFSB is an independent body within the executive branch established under section 311 of the Atomic Energy Act of 1954, which reviews design, construction, operations, and decommissioning activities at DOE's defense nuclear facilities. The DNFSB makes Recommendations to the Secretary of Energy, which it considers necessary to ensure adequate protection of public health and safety. The Secretary may either accept or reject, in whole or in part, the Recommendation. If a Recommendation is accepted, the Secretary must prepare a plan describing the necessary actions to implement the Recommendation. This report covers calendar year 1992 Departmental interactions with the DNFSB and provides an updated status to all active DNFSB Recommendations.

During 1992, the Department supported over 250 meetings and site visits by the DNFSB and its staff. Each DOE defense nuclear facility has appointed a senior representative to coordinate DNFSB visits, and the Department has published detailed guidance for the field on how to interface with the DNFSB, its staff, and consultants. The Department is cooperating fully with the DNFSB, with the goal of meeting the spirit as well as the letter of the law.

More than half of the interfaces cited above were at Savannah River or Rocky Flats. Since its inception, the DNFSB has made major Recommendations regarding both of these sites and DOE's Implementation Plans related to these Recommendations have produced positive results.

Impressive gains have been made at Savannah River K-Reactor. K-Reactor was safely started on June 8, 1992, operated and tested for 7 weeks, and shutdown according to plan on July 30, 1992.

Presently, K-Reactor is in an outage period for system upgrade, modification, and maintenance. The outage is currently on schedule and budget to be ready for reactor restart and testing in May 1993.

The HB-Line Facility at Savannah River was examined by a DOE Operational Readiness Review (ORR) Team in October of 1992. This extensive, thorough ORR was overseen by the Office of Environment, Safety and Health (EH) and the Office of Nuclear Safety (NS). The DNFSB completed their public hearing on "HB-Line restart" in the Savannah River Site area on December 15, 1992. The Secretary gave permission to start the HB-Line on December 29, 1992.

Significant progress was made at Rocky Flats with the successful completion of an ORR in Building 559 and the return to safe operations in that facility.

On August 4, 1992, the Management and Operating (M&O) contractor at Rocky Flats safely completed remediation of the fissile and other material that had accumulated in the ventilation ducts of Building 707. In the Implementation Plan for DNFSB Recommendation 90-6, DOE committed to cleaning the ductwork to a level of plutonium as low as practicable but always below acceptable limits in all flowpaths. Completion of the duct remediation represented a major milestone in the resumption of activities in Building 707. An ORR on Building 707 was completed in November and start-up is expected to take place early in 1993.

Seven new Recommendations were issued by the DNFSB during 1992. Recommendations 92-1 and 92-3 were concerned with the operational readiness of the HB-Line at Savannah River. Recommendation 92-1 was superseded by 92-3 and is closed as described in the DNFSB letter of October 27, 1992, to the Secretary. Recommendation 92-2 addressed the DOE Facility Representative program; 92-4 addressed the design of the new waste tanks at Hanford; 92-5 focused on the discipline of operations at defense nuclear facilities; 92-6 addressed standardization of ORRs; and 92-7 focused on training and qualification.

Five of the seven Recommendations issued in 1990 and two of the six Recommendations issued in 1991 remained active in 1992. These have long term, multi-year Implementation Plans which are progressing according to schedule. The Department closed the following six Recommendations in 1992:

- Recommendation 90-1, Operator Training at Savannah River Site Prior to Restart of K, L, and P Reactors.

- Recommendation 91-1, Strengthening the Nuclear Safety Standards Programs for DOE's Defense Nuclear Facilities.

- Recommendation 91-2, Closure of Safety Issues Prior to

Restart of K-Reactor at Savannah River Site.

- Recommendation 91-3, DOE's Comprehensive Readiness Review Prior to Initiation of the Test Phase at the Waste Isolation Pilot Plant (WIPP).

- Recommendation 91-4, DOE's Operational Readiness Review (ORR) Prior to the Resumption of Plutonium Operations at the Rocky Flats Plant.

- Recommendation 92-1, HB-Line Readiness for Operations.

Recommendation 90-3, Safety at Single-Shell Hanford Waste Tanks, was superseded by Recommendation 90-7.

Many of the DNFSB's Recommendations have led to revisions of DOE Orders that relate to nuclear safety at defense nuclear facilities. For example, Recommendation 90-1 addressed training and qualification issues at the K, L, and P reactors at Savannah River. Although limited to the reactors at one site, the principles embodied in the programs established to respond to DNFSB Recommendation 90-1 are reflected in DOE Order 5480.20, "Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities", thus shaping training and qualification programs across the entire DOE complex.

ANNUAL REPORT TO CONGRESS FOR 1992

I. INTRODUCTION

This is the third Annual Report to the Congress by the U.S. Department of Energy, hereafter referred to as "DOE" or "the Department", on its activities relating to its interactions with the Defense Nuclear Facilities Safety Board (DNFSB). This report is required to be submitted to the Committees on Armed Services and Appropriations and to the Speaker of the House of Representatives each year when the President's Budget is submitted. The statutory reference for this requirement is section 316(b) of the Atomic Energy Act of 1954 (the Act), (42 U.S.C. 2286e(b)), and section 1105(a) of title 31, United States Code.

The DNFSB is an independent body within the executive branch established under section 311 of the Act which reviews design, construction, operations, and decommissioning activities at DOE's defense nuclear facilities. The DNFSB makes Recommendations to the Secretary of Energy, which it considers necessary to ensure adequate protection of public health and safety. The Secretary may either accept or reject, in whole or in part, the Recommendation. If a Recommendation is accepted, the Secretary must prepare a plan describing the necessary actions to implement the Recommendation. The DNFSB conducts public hearings and public meetings as announced in the Federal Register and maintains all their official correspondence with the Department in a public document room.

In November 1991, the Department established an Office of the Departmental Representative to the Defense Nuclear Facilities Safety Board (DR). DR, whose Director reports directly to the Secretary of Energy, provides a central communication link and liaison to the DNFSB for DOE. The Department believes that the relationships and interactions with the DNFSB have improved significantly with the establishment of DR.

This report covers calendar year 1992 Departmental interactions with the DNFSB and provides an updated status to all active DNFSB Recommendations.

II. CALENDAR YEAR 1992 ACCOMPLISHMENTS AT DEFENSE NUCLEAR FACILITIES

A. Summary of DNFSB Recommendation Activity in 1992

Seven new Recommendations were issued by the DNFSB during 1992. Recommendations 92-1 and 92-3 were concerned with the operational readiness of the HB-Line at Savannah River. Recommendation 92-1 was superseded by 92-3 and is closed as described in the DNFSB letter of October 27, 1992, to the Secretary. Recommendation 92-2 addressed the DOE Facility Representative program; 92-4 addressed the design of the new

waste tanks at Hanford; 92-5 focused on the discipline of operations at defense nuclear facilities; 92-6 addressed standardization of ORRs; and 92-7 focused on training and qualification.

Five of the seven Recommendations issued in 1990 and two of the six Recommendations issued in 1991 remained active in 1992. These have long term, multi-year Implementation Plans which are progressing according to schedule. The Department closed the following six Recommendations in 1992:

- Recommendation 90-1, Operator Training at Savannah River Site Prior to Restart of K, L, and P Reactors.

- Recommendation 91-1, Strengthening the Nuclear Safety Standards Programs for DOE's Defense Nuclear Facilities.

- Recommendation 91-2, Closure of Safety Issues Prior to Restart of K-Reactor at Savannah River Site.

- Recommendation 91-3, DOE's Comprehensive Readiness Review Prior to Initiation of the Test Phase at the Waste Isolation Pilot Plant (WIPP).

- Recommendation 91-4, DOE's Operational Readiness Review (ORR) Prior to the Resumption of Plutonium Operations at the Rocky Flats Plant.

- Recommendation 92-1, HB-Line Readiness for Operations.

Recommendation 90-3, Safety at Single-Shell Hanford Waste Tanks, was superseded by Recommendation 90-7.

To support collection of information and data for developing and monitoring implementation of Recommendations, the Department supported over 250 meetings and site visits by the DNFSB and its staff and provided the DNFSB with unfettered access to DOE defense nuclear facilities. Each DOE defense nuclear facility has appointed a senior representative to coordinate DNFSB visits, and the Department has published detailed guidance for the field on how to interface with the DNFSB, its staff, and consultants. The Department is cooperating fully with the DNFSB, meeting the spirit as well as the letter of the law.

B. K-Reactor - Savannah River Site

With significant improvements in operations and safety, K-Reactor has become an example of the new culture within the DOE defense nuclear weapons complex. Operator training at K-Reactor has significantly improved and DOE completed the

Implementation Plan for Recommendation 90-1, Operator Training at Savannah River Site Prior to Restart of K, L, and P Reactors. Fundamentals training for all employees has upgraded knowledge in radiation safety, mathematics, physics, and chemistry. Comprehensive qualification programs require individuals to display both theoretical and practical knowledge of systems and procedures. Final qualification is determined by intense oral examination administered by the M&O contractor management. Post qualification training, aimed at continuous improvement in operator knowledge, includes hands-on emergency procedures training using control room simulators as well as refresher classroom training on K-Reactor fundamentals. As expected, the investment in training has resulted in significant dividends in operator performance, and lessons learned from the successful training program at K-Reactor are being transferred to other facilities at Savannah River and throughout the DOE nuclear complex.

The M&O contractor and DP performed comprehensive ORRs of K-Reactor during 1991. The ORR evaluated whether K-Reactor was ready to be started. The Offices of Environment, Safety and Health (EH) and Nuclear Safety (NS) provided oversight of the DP ORR and concluded that the DP ORR performed a competent review of environmental, safety and health issues. Based on the successful ORR, the Secretary determined that the K-Reactor could be restarted and operated safely. K-Reactor was restarted on June 8, 1992, and operated and tested for the next 7 weeks. The reactor was shutdown according to plan on July 30, 1992.

Presently, K-Reactor is in an outage for system upgrade, modification, and maintenance. This outage is on schedule and budget to be ready for reactor restart and testing in May 1993. Of particular interest to the DNFSB during this outage; heat exchanger replacement has been completed, filter compartment replacement is ongoing, and boron-carbide safety rods will be installed. The excellent performance being seen at K-Reactor is a direct result of the significant changes in culture and operating philosophy in the facility's managers and operators.

C. HB-Line - Savannah River Site

In 1992, DNFSB activities regarding HB-Line were comprised of numerous on-site reviews and visits to examine specific technical and training issues, HB-Line personnel contamination incidents, and an investigation of the approval process leading to the June 1991 restart. Based on issues first raised by NS concerning the approval process leading to the June 1991 restart, DNFSB conducted an investigation into that restart. As a result of this investigation and other

DNFSB activities, two Recommendations specific to HB-Line were issued. Recommendation 92-1, an interim document, was shortly followed and superseded by Recommendation 92-3. Recommendation 92-3 suggested that both the M&O contractor and DOE conduct new ORRs prior to resuming operations in HB-Line. In addition, Recommendation 92-3 made specific suggestions as to ORR scope and content. The Department accepted Recommendation 92-3 and the ORRs were planned in accordance with DOE's Implementation Plan for Recommendation 92-3.

The HB-Line facility was placed on standby in March of 1992 because of an Unreviewed Safety Question (USQ) concerning the H-Canyon exhaust stack liner. Since the Department had accepted Recommendation 92-3 while HB-Line was still in standby for the USQ, restart was planned to follow M&O contractor and DOE ORRs scheduled for the fall of 1992. The M&O contractor completed its ORR in October 1992. Concurrent with the resolution of the USQ, the Department conducted a thorough HB-Line ORR that was completed in November 1992. EH conducted a comprehensive oversight assessment of the ORR to ensure readiness of the facility for safe operation. Both EH and NS had representatives on-site at HB-Line observing the ORR. In addition, NS performed its own review of HB-Line after the ORR was complete. The DNFSB held a public hearing concerning the restart of HB-Line on December 15, 1992. All of the issues requiring correction prior to restart of the HB-Line were satisfactorily resolved, and the Secretary gave permission to start HB-Line on December 29, 1992.

D. Building 559 - Rocky Flats

The M&O contractor and DOE Defense Programs conducted separate ORRs on Building 559 during 1992. These ORRs resulted in the correction of deficiencies and subsequent start-up of the analytical laboratory facilities in Building 559. EH and NS formed a joint team to oversee the ORR conducted by DP and continued monitoring to independently assess readiness to resume plutonium operations. The EH/NS team reviewed the corrective actions needed to resolve concerns for resumption and verified these actions were completed. When post resumption actions were necessary to complete the resolution of an EH/NS concern, the team reviewed the planned actions of the DOE Rocky Flats Field Office and the M&O contractor to ensure closure.

E. Building 707 - Rocky Flats

In accordance with the Department's Implementation Plan for DNFSB Recommendation 90-6, Criticality Safety at the Rocky Flats Plant, the Department completed the remediation of fissile and other material which had accumulated in the

ventilation ducts of Building 707. Removal of the material not only addressed the DNFSB's concern over criticality but also supported the Department's goal of reducing radiation exposure to workers to a level as low as reasonably achievable in Building 707.

Applying the lessons learned from Recommendation 90-1, which addressed operator training at the Savannah River Site reactors, Building 707 made significant improvements in its training and qualification programs and formality of operations. All personnel involved in plutonium operations in Building 707 were enrolled in a comprehensive program designed to upgrade the fundamental knowledge of workers and improve and formalize the day-to-day conduct of building operations. The program has produced noticeable improvements in many areas such as worker health and safety, operational safety, worker knowledge of hazards, environmental awareness, and conduct of operations.

Following the guidelines recommended for ORRs in Recommendations 90-4 and 91-4, the Department conducted an ORR for Building 707 in 1992. Both EH and NS provided the necessary independent oversight for start-up of operations. The M&O contractor is correcting deficiencies found during the ORR and other inspections requiring completion prior to start-up. The Secretary is expected to give permission for start-up by mid-February 1993.

F. High Level Radioactive Waste Storage Tanks - Hanford

High-level radioactive wastes are stored in large underground tanks at DOE's Hanford, Savannah River, Idaho, and West Valley sites; wastes have been stored in some of these tanks for almost 50 years. As age and earlier poor operation and maintenance practices have taken their toll on these facilities, numerous safety issues have been identified and corrective action prioritized. Resolution of the highest priority issues is proceeding through significant expenditure of effort and resources.

At Hanford, positive progress has been made in the areas of tank sampling, tank modeling, and characterization of the properties of synthetic and actual ferrocyanide wastes. This is essential in the effort to resolve a ferrocyanide Unreviewed Safety Question. A status paper documenting the current understanding of this issue has been prepared, which forms the technical basis for updating the Implementation Plan for responding to DNFSB Recommendation 90-7.

Twenty-four tanks at Hanford have also been identified as having a significant potential for accumulation and periodic release of flammable gases. In the unlikely event that the

flammable gas mixture is ignited, a release of radioactive material might occur. During 1992, substantial progress was made toward mitigation of the flammable gas tank of most concern, Tank 101-SY. Mitigation work included the removal of four air lances (all of which were considered potential spark sources), the development and installation of instrumentation that will increase our understanding of how gas is retained and released in the tank, and significant modifications to an existing grout pump in order to test the mitigation concept of jet mixing. Other mitigation work completed in 1992 included sampling and analysis of two tank core samples, and synthetic waste studies to help understand the radiolytic and thermal mechanisms by which flammable gas mixtures are generated.

The Hanford Tank Farm is designated as one of the eight priority facilities for implementation of DNFSB Recommendation 90-2. During 1992, efforts have been initiated to prepare an action plan and Requirements Identification Document (RID) for the double shell tanks. Once completed, this pilot RID effort will be used to establish a baseline for determining resource requirements and schedules for tank farms at the Savannah River, Idaho, and West Valley sites.

In addition, conceptual design of a Multi-Function Waste Tank Facility (MWTF) at Hanford has been completed. This will provide for additional safe storage capacity and limited pretreatment capabilities. The DNFSB, their staff, and outside experts have reviewed the MWTF design and have provided recommendations (Recommendation 92-4) and comments regarding the project. EH assisted the Office of Environmental Restoration and Waste Management (EM) in evaluating the occupational safety and health (OSH) program for the Tank Farms at the Hanford site. EH conducted an independent assessment to determine whether the line (EM and the DOE Richland Field Office) organization has:

a. Identified OSH issues affecting the tank farm workers;

b. Appropriately prioritized these issues, commensurate with the risk to workers; and

c. Established an adequate process to provide the technical basis to resolve the issues.

The EH assessment report was completed in October and released in November 1992.

G. Waste Isolation Pilot Plant (WIPP)

The Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act (P.L. 102-579) was signed into law on October 30, 1992. This Act authorizes the WIPP to begin test activities using transuranic radioactive waste within 10 months provided all Test Phase prerequisites are met. A comprehensive ORR will be completed in 1993 to verify that readiness has been maintained at the WIPP since the previous successful ORR of September 1991.

WIPP's primary mission in 1992 was to maintain its state of readiness to receive the first shipment of transuranic waste to begin Test Phase activities. The Test Phase is designed for testing and experimental activities to determine the suitability of WIPP as a repository for the permanent isolation of transuranic waste received from DOE defense nuclear facilities.

DNFSB staff members and consultants visited WIPP three times in 1992. The first two visits concentrated on review of WIPP's continued readiness to receive transuranic waste, on the fire and radiation protection programs, and on Occupational Health and Safety personnel qualifications. The third visit focused on familiarization with and fact finding of the WIPP standards program. The DNFSB issued no Recommendations to the Secretary as a result of the visits and other related activities.

H. Defense Waste Processing Facility (DWPF) - Savannah River Site

In early 1992, the Savannah River Defense Waste Processing Facility (DWPF) was selected by Headquarters to be one of the eight priority facilities for implementation of Recommendation 90-2 regarding standards and Orders. In response, DWPF has initiated an aggressive program to evaluate and implement DOE's response to this Recommendation. The first phase of this effort has resulted in a significant amount of work to prepare an action plan and develop a Requirements Identification Document (RID) to include 5 of 18 functional areas by which DWPF has categorized its environment, safety, and health configuration.

This activity is being conducted at the same time as the preparation for the DWPF cold chemical run, which started in December 1992. The Assistant Secretary for Environmental Restoration and Waste Management briefed the DNFSB prior to his approval to begin the cold chemical run.

During 1992, the DWPF Independent Technology Review Team presented a briefing to the DNFSB staff on the results of its review to assess the approach for resolving process technology issues at the facility. Other DWPF staff

presented numerous technical briefings during 1992 to the DNFSB and provided unfettered access for the DNFSB staff to DWPF documentation.

I. Order Compliance

1. DOE Orders and Standards

The Department has moved to expedite the issuance of DOE Nuclear Safety Orders. In October 1991, DOE provided the DNFSB with a four-phased schedule showing the priorities and groupings of nuclear safety standards for development. There have been six briefings for the DNFSB in 1992 on specific Orders, the development of Nuclear Safety Orders, and the DOE Technical Safety Standards Program. The following progress has been made:

- All Phase I nuclear safety Orders have been issued, seven in 1991, and three in 1992.

- Two Phase II nuclear safety Orders have been issued in 1992, and the other seven are scheduled for issuance early in 1993.

- Two other nuclear safety Orders are scheduled for revision early in 1993.

- One Secretary of Energy Notice has been issued; and

- Sixteen DOE technical standards have been developed with an additional six technical standards to be completed by early 1993.

Recognizing the significance of Nuclear Safety Standards, DOE is working to enhance the development and implementation of standards through an integrated program that incorporates the lessons learned from the Study to Strengthen DOE Nuclear Safety Standards (DNFSB Recommendation 91-1). Key elements of the program have already been implemented to streamline the development and execution process.

DOE Order 1300.2A, the DOE Technical Standards Program, issued in May 1992, required the use of appropriate international, national, and Departmental technical standards. In addition to increased activities in critically assessing technical standards, the Department has placed increased emphasis on the development of new DOE technical standards where existing standards do not exist or suffice. The

Department has established an infrastructure to support the development, adoption, and application of technical standards. One key step in this process was the DOE Technical Standards Managers Workshop, held in October 1992. This workshop brought together the standards managers from throughout the DOE complex including Headquarters, the DOE Field Offices, and M&O contractors to promote a consistent approach to technical standards. Another completed step was the issuance of the working draft of the Technical Standards Program Procedures Manual which provides guidance on the development, format, coordination, and approval of technical standards. A formal training program for technical standards was also established and is presently being conducted at Headquarters and several field sites for DOE and M&O contractor personnel.

The Department currently plans and anticipates that in 1993, additional Nuclear Safety Standards and Orders will be issued including:

- Six new Nuclear Safety Orders, and

- Twenty-six good practices and handbooks issued as technical standards.

2. Implementation of DNFSB Recommendations 90-2 and 91-1.

   a. DNFSB Recommendation 90-2, Design, Construction, Operation and Decommissioning Standards at Certain Priority DOE Facilities.

      During 1992, the Department has continued to develop and implement the provisions of DNFSB Recommendation 90-2 through the promulgation of the 90-2 Implementation Plan (Revision 2) and the subsequent Revision 3 of December 1992. The Office of Defense Programs (DP) has continued its role as lead for development of this plan.

      DP has continued to implement its plans laid forth in 1991 for requirements identification and compliance assessment. DP Headquarters, Field Office, and M&O contractors for the Rocky Flats Plant and the Savannah River Site performed a rigorous, documented compliance self-assessment against Department Orders of interest to the DNFSB. Compensatory actions were identified with corresponding justification for their use prior to completion of corrective actions. In addition, design, construction, and operations

standards were identified. The activities associated with the implementation of Recommendation 90-2 were discussed in detail with the DNFSB during public briefings for the Savannah River K-Reactor and Rocky Flats Building 559. Detailed documentation for these facilities were also provided to the DNFSB. All other DP sites and major facilities are conducting similar compliance assessment and validation programs which are expected to be completed in 1993. Numerous meetings with the DNFSB staff have been held to monitor these self-assessments.

In 1992, DP made significant progress on its development of the Generic Requirements Identification Document (RID) and expects its first issuance in the summer of 1993. The Generic RID will be used to produce site and facility RIDs to document the requirements and standards for operating DP facilities safely and in full consonance with appropriate current industry and other standards. Each site will develop an initial site and one facility RID as well as a detailed action plan identifying which facilities (based on an identifiable mission) will develop RIDs and the schedule for doing so.

Since early 1992, the Office of Environmental Restoration and Waste Management (EM) has assumed a proactive role in the implementation of DNFSB Recommendation 90-2. Because the numerous facilities and activities under EM's purview are unique entities with specific missions and functions--ranging from highly complex processing to simple handling and storage to decontamination and decommissioning to environmental remediation--it is essential that both a graded and facility/activity-specific approach be applied to standards development. To accomplish this objective, EM has established a process that is described in detail in the Implementation Plan for Recommendation 90-2.

During Phase I of the program conducted during 1992, EM performed initial assessments for two high priority facilities from each of the four EM operations categories; Operating Facilities, Mission Transition Facilities, Decontamination and Decommissioning Facilities, and Environmental Remediation Sites/Activities.

The priority facilities were selected by the Assistant Secretary for EM because they are important to the EM Mission; have significant hazard potential; are of interest to the DNFSB; and present the best opportunity for rapid, successful completion of Phase I of the 90-2 Implementation Plan, with minimum adverse impact on current site activities.

This Phase I effort by EM has involved:

- Preparation of action plans for each category of facilities;

- Selection of an environment, safety, and health configuration methodology;

- Convening of a team of facility and independent subject matter experts to conduct the facility safety reviews including:

    o identification of requirements and standards,

    o performance of an initial adequacy assessment measured against applicable standards and requirements regardless of their sources, and

    o development of requirements identification documents (RIDs),

- Conduct of compliance assessments against the RIDs;

- Development of a generic RID for each category of EM operation;

- Revision of the Implementation Plan, and other policies, plans, and procedures, as necessary; and

- Conduct of continued assessments to assure compliance.

The significant progress in the Phase I effort to date is exemplified by the New Waste Calcining Facility project in Idaho. This project is evidence that the 90-2 process works and demonstrates the long-term value of the program.

To track the progress of the Phase I priority facility projects and to provide a forum for discussion of issues that arise throughout the initial Phase I effort, several EM workshops have been held throughout the year. These sessions have resulted in the formation of smaller working groups that have focused on such topics as standardization of functional areas and their scope, the RIDs development process, and data base management of the RIDs. DP has participated in these working groups in an effort to attain consistent terminology, specificity, and documentation. A steering committee has also been established to ensure the integration of all EM Recommendation 90-2 activities and products.

Following the completion of Phase I, the 90-2 implementation program will be reviewed by EM's oversight organization and Deputy Assistant Secretaries to refine the Phase I process for the next set of priority facilities, and to initiate the second, longer-term process for all EM facilities and activities. Phase II activities are to include:

- Further development of a generic RID for each EM category of operation;

- Development of facility RIDs for Phase II facilities;

- Compliance assessments for Phase II facilities

- Development of Safety Analysis Reports (SAR) Guidance, incorporating the generic RIDs;

- Preparation and update of SARs;

- Assessment of compliance through oversight and self-assessments; and

- Revision of DOE Orders.

The 90-2 program will be considered implemented when the Phase II process has been completed for each organization, a continual self-assessment process for all EM facilities has been established and associated activities scheduled, and the 90-2 process has been instituted as a

routine part of EM management and codified in EM Quality Assurance procedures.

The Department's efforts in this important area of standards has resulted in significant progress. This is a long term multi-year effort requiring continuing senior managerial attention.

b. DNFSB Recommendation 91-1, Strengthening the Nuclear Safety Standards Programs for DOE's defense nuclear facilities.

In March 1991, the DNFSB transmitted Recommendation 91-1 to the Secretary. The DNFSB recommended the Department reexamine its processes to develop and implement DOE Nuclear Safety Standards. The Secretary accepted the Recommendation and issued an Implementation Plan in August 1991.

The Implementation Plan described a study that would be undertaken by the Department to evaluate the processes by which the nuclear safety standards are developed and implemented. As noted in the Implementation Plan, the study comprised three major tasks: (1) a critical evaluation of standards development, (2) a critical evaluation of standards implementation, and (3) the development of an action plan to strengthen DOE standards.

The Department briefed the DNFSB on progress and measures implemented during the course of the study to strengthen both the development and implementation process for Nuclear Safety standards. Briefings were conducted in January, March, June, and September 1992. The Department also periodically transmitted written progress reports and responses to questions from the DNFSB.

The study to Strengthen DOE Nuclear Safety Standards initially focused on M&O contractors and DOE field organizations in order to determine how existing processes and organizational infrastructures have either facilitated or impeded the development and implementation of standards. Teams led by DOE personnel, supported by contractors, conducted interviews to identify common strengths and weaknesses in field practices, formulating specific issues for closer

examination. The study then focused on DOE Headquarters, using questionnaires and interviews to validate the issues identified in the field. The intent of the interviews, both at Headquarters and in the field, was to solicit information and gather data for analysis, not to conduct a compliance audit. Over 300 interviews and questionnaires were used to gather information at eight Program Secretarial Offices at Headquarters, five DOE Field/Site Offices, and seven M&O contractor organizations.

The study to Strengthen DOE Nuclear Safety Standards concluded that, despite substantial progress made toward improving the safety culture within the DOE complex, the Department and its M&O contractors must continue to emphasize the need to strengthen and maintain management involvement and accountability so Nuclear Safety standards will continue to be developed and applied throughout the Department.

The final deliverable in the DOE Implementation Plan for Recommendation 91-1 was an action plan which incorporates the lessons learned from the completed studies. This plan, approved by the Secretary on August 14, 1992, identified the Department's actions to date and its commitments for future action in eight specific areas. Actions resulting from two of the eight items have already been completed. Although significant progress towards completion of the remaining items was achieved in 1992, final completion is scheduled in 1993.

3. Other DNFSB Recommendations

In the Department's review and revision of non-nuclear Orders and standards, a strong effort was made to address the concerns highlighted in the various DNFSB Recommendations. The effort cut across the entire range of DOE Orders ensuring a coordinated and consistent safety policy throughout the Department. For example, although Recommendation 90-1 addressed the training and qualification of operators at the Savannah River Site reactors, the concepts and ideas outlined by the DNFSB were integrated into the Technical Standards Program (DOE Order 1300.2A), Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities (DOE Order 5480.20), and Quality Assurance (DOE Order 5700.6C). The review and revision of DOE Orders as

related to DNFSB Recommendations will continue into 1993.

4. Rulemaking Status

The Department has achieved significant progress in developing nuclear safety rules. The Department of Energy Notice of Proposed Rulemaking (NOPR) 10 CFR Part 830 and Part 835, were published in the Federal Register on December 9, 1991. These notices contained proposed rules applicable to nuclear safety at DOE facilities. These rules will form the basic requirements for ensuring nuclear safety at DOE facilities, and the rules stem from the Department's ongoing effort to strengthen the protection of health, safety, and environment from nuclear and radiological hazards posed by these DOE facilities. Violations of these and subsequent codified nuclear safety rules will provide a basis for civil and criminal penalties under the authority of the Price-Anderson Amendments Act of 1988. The procedural rules for DOE's enforcement authority were also published for comment on December 9, 1991, as 10 CFR Part 820.

Public Hearings on these proposed rules were held by the Department in February 1992. All comments resulting from those hearings, as well as all written comments on the NOPRs, have been categorized, retained on a comment tracking data base, and assigned to a designated member of the Office of Primary Interest for comment resolution. Comment resolution will be coordinated with the Office of General Counsel and will be published as part of the final rules. The Department has also developed Safety Guides which will accompany the final rules. These rules are expected to be issued early in 1993.

5. Occurrence Reporting

DOE Order 5000.3A, Occurrence Reporting and Processing of Operations Information, was issued on May 30, 1990, and became effective on September 1, 1990. The DNFSB has been periodically briefed during the past 2 years regarding occurrence reporting. Using input from a DOE-wide lessons learned meeting held in 1991, the Order has been extensively revised and is planned to be reissued as DOE Order 5000.3B in early 1993. The revised Order:

- Refines the reporting thresholds;

- Refines the reporting time limits;

- Expands safeguards and security and transportation requirements;

- Treats recurring events/conditions;

- Addresses classification and utilization issues; and

- Refines the requirements on report content.

In addition, many enhancements have been made to the Occurrence Reporting and Processing System (ORPS), the computerized data base of occurrence reports. ORPS, an on-line reporting system, shares information such as lessons-learned among 4,000 users. In the last 12 months, 7,000 occurrences have been entered on the system bringing the total data base to more than 13,000 occurrences.

ORPS is currently being used extensively by the Department to trend and analyze occurrences. Both NS and EH are using ORPS to identify site specific and complex-wide safety issues. Program weaknesses are noted and distributed to the Department in office safety bulletins. ORPS is also being used by line managers to improve plant operations. For example, in 1992, based on the number of emergency power system failures being reported, the ORPS system was used to identify the total number of incidents that occurred; the types of facilities where they were occurring; and the root, direct, and contributing causes for their failure. This effort resulted in a formal report to the Secretary with corrective actions for improving the emergency power systems at DOE facilities.

This is an area to which the Department has paid particular attention since responsive reporting of incidents throughout the defense nuclear complex is a vital action in establishing a new and lasting safety culture at DOE. Great strides have been made in promoting an open environment to "fix the problem and not fix the blame".

J. Quality Assurance Program

In 1990, the Department initiated a quality assurance "culture" to improve safety and reliability of the DOE's programs, projects, and facilities. DOE Order 5700.6C, issued on August 21, 1991, redirected the Department's quality assurance requirements, now synonymous with a total management system, to be more performance oriented.

To facilitate the implementation of the quality assurance program, NE developed a fundamentals course for DOE and M&O contractor personnel. Through the end of 1992, 2,900 individuals had received the fundamentals training (2,500 M&O contractor, 200 DOE Field Office, and 200 DOE Headquarters personnel). Follow-on courses in quality improvement and management assessment are developed and will be offered beginning in February 1993. Courses in work processes and independent assessment are under development and scheduled for delivery by mid-1993.

K. Performance Indicator System

The Department continues to monitor the effectiveness of facility operations through a system of performance indicators. DOE and M&O contractor management is responsible for collecting performance data and analyzing this data to indicate abnormal trends. When weaknesses are detected, line management is responsible for taking corrective action. For example, one DOE Field Office identified and took action to improve inadequate M&O contractor performance in maintenance activities. The inadequacies were attributed to inconsistent implementation of the work control system, poor validation of work packages, and poor work planning. Another DOE Field Office detected an increasing number of skin contaminations at their facility. Using the performance indicator system, the contractor identified the root cause of the problem, that is, inadequate planning of radiation work and inadequate training, and took appropriate corrective action.

L. Environment, Safety, and Health

In response to specific direction by Secretary Watkins, the Office of Environment, Safety, and Health (EH) developed the DOE Radiological Control (RadCon) Manual which was approved by the Secretary in June 1992. This comprehensive manual defines the Department's philosophy and standards for radiological control practices. The RadCon Manual is a major step in Secretary Watkins' ongoing initiative to further improve radiological protection at DOE facilities. The Manual's provisions challenge DOE and M&O contractor facilities to go beyond minimum requirements necessary for worker safety and health related to radiological practices. The RadCon Manual serves as the keystone in DOE's initiative to establish excellence in radiological health and safety and reaffirms the Department's commitment to the protection of workers, the public, and the environment. The RadCon Manual, which adopted, as appropriate, the latest national and international recommendations on radiation protection and control, is a prescriptive guide for line managers who are responsible for radiological control programs. This comprehensive document encourages standardization of

operations, establishes uniform and consistent training, and provides the framework for expected practices in radiological protection.

In addition, the Office of Nuclear Safety has developed a Nuclear Safety Operating Experience Weekly Summary as a means of disseminating operating lessons learned from nuclear industry occurrences. This publication is widely distributed within DOE and throughout the nuclear industry, and has been a valuable tool in improving safety across the DOE nuclear complex.

III. DNFSB CALENDAR YEAR 1990 RECOMMENDATIONS

In 1990, the DNFSB issued seven Recommendations. Five of these Recommendations remained active in 1992.

A. Recommendation 90-2, Design, Construction, Operation, and Decommissioning Standards at Certain Priority DOE Facilities.

Recommendation 90-2, issued on March 8, 1990, addressed safety standards at DOE facilities. The DNFSB recommended that: (1) DOE identify the applicable standards, DOE Orders, and other requirements for each facility; and (2) DOE provide its view on the adequacy of the standards and requirements and determine the extent to which the standards and requirements had been implemented. On January 24, 1992, the DNFSB informed DOE of deficiencies noted in the November 14, 1991 Implementation Plan. Most notably, the plan restricted the scope of the DOE standards review to those standards stated or referenced in DOE Orders. The DNFSB was concerned that the 90-2 plan focused too narrowly on Order compliance rather than on the larger body of standards which may be applicable. The DNFSB also expressed its concern regarding the management of the plan and lack of consistency between the Program Secretarial Offices in implementing the plan.

In the following months, several meetings between DOE and the DNFSB were held to discuss 90-2 alternatives and actions. In parallel, an internal DOE team composed of personnel from the Office of Defense Programs and the Office of Environmental Restoration and Waste Management drafted a revised Implementation Plan. The revised Implementation Plan was submitted to the DNFSB on December 24, 1992.

B. Recommendation 90-4, Operational Readiness Review at the Rocky Flats Plant.

The DNFSB Recommendation 90-4, issued in May 1990, was based on the DNFSB's review of the Rocky Flats restart effort. Recommendation 90-4 called for an Operational Readiness

Review (ORR) prior to resumption of plutonium processing operations.

Since Recommendation 90-4 was issued, the primary mission of Rocky Flats has changed from plutonium pit manufacturing to plutonium clean-up operations. On April 16, 1992, DOE stated its commitment to perform ORRs for each applicable building to confirm operational readiness to conduct plutonium handling and clean-up operations. An ORR was satisfactorily completed for Building 559 (see Recommendation 91-4), and plutonium operations were resumed in April 1992. An ORR to determine the readiness of Building 707 for conducting plutonium operations was completed in November 1992. Building 707 is expected to resume operations in January 1993.

C. Recommendation 90-5, Systematic Evaluation Program at the Rocky Flats Plant.

Recommendation 90-5 was issued in May 1990. The DNFSB recommended that DOE undertake a Systematic Evaluation Program (SEP) for Rocky Flats similar to the program undertaken by the Nuclear Regulatory Commission in the early 1980s. That program, as noted by the DNFSB, was a means of evaluating older facilities against current standards. When the Secretary forwarded the DOE Implementation Plan for this Recommendation on October 15, 1990, he stated the reactors at the Savannah River Site would be included in the SEP.

Work on the SEP is progressing in accordance with the Implementation Plan. DOE has continued to provide quarterly status reports to the DNFSB on the Rocky Flats Plant and the Savannah River reactors. Phase I of the SEP has been completed for the Rocky Flats Plant. The DOE Phase I Evaluation Report for Rocky Flats has been provided to the DNFSB. Phase II, the building specific evaluation phase has been initiated for Building 707. At the Savannah River Site, Phase I is expected to be completed by mid-1993.

D. Recommendation 90-6, Criticality Safety at the Rocky Flats Plant.

This DNFSB Recommendation was issued to the Secretary on June 5, 1990. The Secretary accepted the Recommendation on July 24, 1990.

DNFSB Recommendation 90-6 addresses criticality safety at Rocky Flats, particularly relating to plutonium accumulation in the ventilation ducts. The DNFSB recommended that, prior to resumption of plutonium operations at the plant, DOE prepare a written plan to address plutonium accumulation in the ducts and related systems with the objectives of ensuring

a criticality event would not take place and the fissile material and other debris in the ventilation systems will be properly removed or substantially reduced in amount.

Implementation of the plan for Recommendation 90-6 continued into 1992 with the clean-up and assay of material found in the ventilation ducting. On August 4, 1992, the site completed remediation of the material deposited in the ventilation ducts of Building 707.

E. Recommendation 90-7, High-Level Radioactive Waste Storage Tanks at Hanford.

DNFSB Recommendation 90-7 was issued to the Secretary on October 12, 1990. This Recommendation supersedes DNFSB Recommendation 90-3, Safety at Single-Shell Hanford Waste Tanks. In 90-7, The DNFSB recommended additional actions and an acceleration of implementation schedules.

Work on Recommendation 90-7 continues with quarterly status reports being submitted to the DNFSB.

IV. DNFSB CALENDAR YEAR 1991 RECOMMENDATIONS

In 1991, the DNFSB issued six Recommendations, all of which were accepted by the Secretary. Four of the Recommendations were closed in 1992. The status of the 1991 Recommendations that remained active in 1992 is summarized below.

A. Recommendation 91-5, Power Limits for K-Reactor Operation at the Savannah River Site.

In Recommendation 91-5, dated December 19, 1991, the DNFSB requested to be informed of any decision by DOE to increase the K-Reactor's power level above 30 percent of the historical maximum full power. If DOE decided to operate the K-Reactor above the 30 percent power level, the DNFSB recommended that DOE conduct engineering and accident analyses to ensure safe operation.

On February 7, 1992, the Secretary accepted Recommendation 91-5. The Secretary's response stated that at that time, DOE had no intention to increase reactor power level above 30 percent. If the need to operate above this level developed, the Department would develop an Implementation Plan for this Recommendation. Inasmuch as there are no current plans to exceed the 30 percent reactor power level, no further action on this Recommendation is anticipated.

B. Recommendation 91-6, Radiation Protection for Workers and the General Public at DOE defense nuclear facilities.

The DNFSB Recommendation 91-6 was based on the need for increased DOE attention in the following areas:

- DOE management and leadership in radiation protection programs;
- Radiation protection standards and practices at defense nuclear facilities;
- Training and competence of Health Physics technicians and supervisors;
- Analysis of reported occurrences and correction of radiation protection program deficiencies; and
- Understanding and attention to radiation protection issues by individuals in DOE and its M&O contractor organizations.

On January 31, 1992, the Secretary accepted Recommendation 91-6 stressing the Department's commitment to a radiological control program of the highest quality. On June 17, 1992, the Implementation Plan for 91-6 was submitted to the DNFSB.

In June 1992, the Department issued the DOE Radiological Control (RadCon) Manual. The objective of this manual is to standardize and upgrade radiological control programs across the Department. The activities required by DOE's Implementation Plan for Recommendation 91-6 will continue into 1993.

V. DNFSB CALENDAR YEAR 1992 RECOMMENDATIONS

In 1992, the DNFSB issued seven Recommendations. The following is a summary description of each Recommendation and action taken by the Secretary. Appendix A contains copies of these Recommendations.

A. Recommendation 92-1, Operational Readiness of Savannah River Site HB-Line

On May 21, 1992, the DNFSB issued the first Recommendation of 1992 addressing the operational readiness of the HB-Line at the Savannah River Site. Specifically, the DNFSB recommended DOE defer resumption of processing at the HB-Line for the present, pending issuance of the report of the DNFSB's HB-Line investigation, resolution of the issues and possible further DNFSB action. After the M&O contractor and DP ORRs were complete, the DNFSB issued a letter on October 27, 1992, closing out this Recommendation as it had been superseded by Recommendation 92-3.

B. Recommendation 92-2, Facility Representative Program at Defense Nuclear Facilities.

On May 28, 1992, the DNFSB issued Recommendation 92-2 addressing the weaknesses of the Department's Facility Representative Program. In their letter to the Secretary, the DNFSB noted the inconsistencies in selection, training, and responsibilities for these positions.

The DNFSB recommended that for defense nuclear facilities a comprehensive analysis be completed of Facility Representative Programs. This analysis should be used to estimate the personnel and management resources needed to establish and maintain an effective Facility Representative Program. The program should consider selection, training, qualification and assignment of Facility Representatives at DOE defense nuclear facilities.

On July 20, 1992, the Department responded by accepting the DNFSB's Recommendation, noting that due to differences in facilities within the Department some variance in the Facility Representative requirements may prove to be appropriate, and some existing Facility Representative programs may be found to be acceptable to the DNFSB. The Department's Implementation Plan, submitted on November 5, 1992, committed to:

- Conduct an analysis of the existing DOE Facility Representative programs at defense nuclear facilities; and

- Use the results either to establish a more structured and formal Facility Representative program at these facilities, or to improve already existing programs, if required.

C. Recommendation 92-3, Savannah River Site HB-Line Operational Readiness Review (ORR).

On May 29, 1992, the DNFSB issued Recommendation 92-3, a furtherance of Recommendation 92-1, which expressed the DNFSB's concern over the adequacy, scope, and timing of the most recent HB-Line ORR. The DNFSB recommended that prior to resuming operations in the HB-Line, DOE direct the M&O contractor to reopen its ORR, and the contractor and DOE conduct adequate ORRs in accordance with previous DNFSB Recommendations and DOE Implementation Plans for ORRs at other facilities. Recommendation 92-3 was accepted by the Secretary and the Implementation Plan was forwarded on September 15, 1992.

All necessary actions, including new contractor and DOE ORRs and additional NS and EH reviews have been completed. The M&O contractor corrected outstanding deficiencies and DNFSB hearings were held on December 15, 1992, in Aiken, South Carolina. All HB-Line ORR and other review findings requiring pre-start resolution, have been corrected. On December 29, 1992, the Secretary gave permission to start up.

D. Recommendation 92-4, Design of the Multi-Function Waste Tank Facility (MWTF) at Hanford.

On July 6, 1992, the DNFSB issued Recommendation 92-4 addressing the conceptual design of the Multi-Function Waste Tank Facility (MWTF) at Hanford. In the DNFSB's opinion, the conceptual design of the MWTF does not clearly present and delineate those aspects that ensure the public health and safety can be adequately protected. To ensure the appropriate nuclear safety characteristics are included in the design efforts, the DNFSB recommended the following:

1. Establish a plan and methodology that results in a project management organization for the MWTF project team that assures that both DOE and the M&O contractor organization have personnel of the technical and managerial competence to ensure effective project execution. This should emphasize management aspects of the project necessary to ensure adequate protection of public health and safety and should include the integration of professional engineering and quality assurance as necessary into the project, the application of appropriate standards and approved Department of Energy requirements, and the establishment of clear lines of responsibility and accountability.

2. Identify the design bases and engineering principles and approaches for the MWTF project that provide the data and rationale to show that the design for the MWTF conservatively meets the quantitative safety goals described in the Department's Nuclear Safety Policy (SEN-35-91). The DNFSB believes that this would include items related to standards, identification of safety related items, detailed design bases, functional design criteria, and safety analyses.

Recommendation 92-4 was accepted by the Secretary on August 28, 1992, and the Implementation Plan will be submitted to the DNFSB in early 1993.

E. Recommendation 92-5, Discipline of Operation in a Changing Defense Nuclear Facilities Complex.

Recommendation 92-5 was issued by the DNFSB on August 17, 1992. The DNFSB made the following points regarding discipline of operations:

1. For Defense Nuclear Facilities scheduled for long term continued programmatic defense operations or for other long term uses such as in cleanup of radioactive contamination or in storage of nuclear waste or other nuclear material from programmatic defense operations, the Department of Energy should institute a style and level of conduct of operations comparable to that required for commercial nuclear facilities. This should address, at a minimum, the operational requirements, maintenance requirements, and safety goals contained in SEN-35-91, issued on September 9, 1991.

2. Where a facility, after a long period of idleness for whatever reason, is being readied for new use or reuse, special care should be taken to ensure that the line organization, both DOE and M&O contractor, has the technical and managerial capability needed to carry out responsibilities. Appropriate and effective ORRs should be conducted by the M&O contractor and by DOE before restart of the facility, to establish confidence that line management has satisfied safety requirements. Where national security requirements lead to urgent need to restart such facilities before necessary upgrades can be fully completed, compensatory measures should be instituted and their adequacy in ensuring the desired level of safety should be confirmed through appropriate independent review.

3. For facilities designated for the various other future modes of use (such as standby), DOE should undertake to develop specific criteria and requirements that ensure meeting the safety goals enunciated in SEN-35-91 Nuclear Policy Statement. Accomplishment of these criteria and requirements by line management should be confirmed by appropriate independent review.

This Recommendation has been accepted with the Implementation Plan forwarded to the DNFSB on December 16, 1992.

F. Recommendation 92-6, Operational Readiness Reviews.

Recommendation 92-6 on Operational Readiness Reviews (ORRs) was issued by the DNFSB on August 26, 1992. It includes the following specific recommendations:

1. DOE should expeditiously develop a set of rules, procedures, Orders, directives, and other requirements

to govern safety aspects of the ORR process, subject to the principle that the purpose of such reviews is confirmation of an acceptable state of readiness.

2. DOE should develop specific criteria for when ORRs are required and when they are not.

3. The plan for each ORR should incorporate the features discussed in the body of this Recommendation and those discussed in Recommendation 90-4.

This Recommendation was accepted by the Secretary on November 6, 1992. The Implementation Plan is due to the DNFSB on February 4, 1993.

G. Training and Qualification Throughout the Defense Nuclear Complex.

Recommendation 92-7 on training and qualification at defense nuclear facilities was issued by the DNFSB on September 22, 1992. Based on its review of DOE facilities throughout the defense nuclear complex, the DNFSB believes there is a need for DOE to take action to strengthen training of technical personnel.

The Secretary's acceptance letter and Implementation Plan described the details of the progress made by the Department and M&O contractor organizations in recruiting, selecting, training and qualifying personnel at the defense nuclear facilities. The Orders that the Department has written and put into effect with respect to training and qualification are based upon accepted nuclear industry standards and comply with the letter and spirit of the specifics in Recommendation 92-7. The Department's acceptance letter and Implementation Plan focused on three issues:

- Senior management involvement in the development and implementation of training programs.

- Recruitment, selection, training, and qualification of personnel at defense nuclear facilities.

- Development of DOE standards on training and qualification which parallel, and in many cases exceed, the requirements for commercial, NRC-licensed, non-nuclear facilities.

This Implementation Plan will be forwarded to the DNFSB by the Secretary in early 1993.

LIST OF ACRONYMS

DNFSB	Defense Nuclear Facilities Safety Board
DP	Office of Defense Programs
DWPF	Defense Waste Processing Facility
DOE	Department of Energy
DR	Office of the Departmental Representative to the Defense Nuclear Facilities Safety Board
EH	Office of Environment, Safety, and Health
EM	Office of Environmental Restoration and Waste Management
M&O contractor	Management and Operating contractor
MWTF	Multi-Function Waste Tank Facility
NS	Office of Nuclear Safety
ORPS	Occurrence Reporting and Processing System
ORR	Operational Readiness Review
RadCon	Radiological Control
RID	Requirements Identification Document
SEP	Systematic Evaluation Program
USQ	Unreviewed Safety Question
WIPP	Waste Isolation Pilot Plant

APPENDIX A

TABLE OF CONTENTS

APPENDIX A

STATUS OF RECOMMENDATIONS

RECOMMENDATION	NAME	STATUS
Recommendation 90-1	Operator Training at Savannah River Site Prior to Restart of K, L, and P Reactors	Closed
Recommendation 90-2	Design, Construction, Operation, and Decommissioning Standards at Certain Priority DOE Facilities	Open
Recommendation 90-3	Safety at Single-Shell Hanford Waste Tanks	Closed
Recommendation 90-4	Operational Readiness Review at the Rocky Flats Plant	Open
Recommendation 90-5	Systematic Evaluation Program at the Rocky Flats Plant	Open
Recommendation 90-6	Criticality Safety at the Rocky Flats Plant	Open
Recommendation 90-7	High-Level Radioactive Waste Storage Tanks at Hanford	Open
Recommendation 91-1	Strengthening the Nuclear Safety Standards Programs for DOE's Defense Nuclear Facilities	Closed
Recommendation 91-2	Closure of Safety Issues Prior to Restart of K-Reactor at Savannah River Site	Closed
Recommendation 91-3	DOE's Comprehensive Readiness Review Prior to Initiation of the Test Phase at the Waste Isolation Pilot Plant (WIPP).	Closed

RECOMMENDATION	NAME	STATUS
Recommendation 91-4	DOE's Operational Readiness Review Prior to the Resumption of Plutonium Operations at the Rocky Flats Plant.	Closed
Recommendation 91-5	Power Limits for K-Reactor Operation at the Savannah River Site	Open
Recommendation 91-6	Radiation Protection for Workers and the General Public at DOE defense nuclear facilities	Open
Recommendation 92-1	HB-Line Readiness for Operations	Closed
Recommendation 92-2	Facility Representative Program at Defense Nuclear Facilities	Open
Recommendation 92-3	Savannah River Site HB-Line Operational Readiness Review	Open
Recommendation 92-4	Design of the Multi-Function Waste Tank Facility (MWTF) at Hanford	Open
Recommendation 92-5	Discipline of Operation in a Changing Defense Nuclear Facilities Complex	Open
Recommendation 92-6	Operational Readiness Reviews	Open
Recommendation 92-7	Training and Qualification Throughout the Defense Nuclear Complex	Open

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004
(202) 208-6400 • FTS 268-6400

May 21, 1992

The Honorable James D. Watkins
Secretary of Energy
Washington, DC 20585

Dear Mr. Secretary:

On May 21, 1992, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(5), unanimously approved Recommendation 92-1 which is enclosed for your consideration. Recommendation 92-1 deals with operational readiness of the HB-Line at the Savannah River Site.

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

APPENDIX A

RECOMMENDATION 92-1
OPERATIONAL READINESS OF THE SAVANNAH RIVER SITE HB-LINE

(2 PAGES)

RECOMMENDATION TO THE SECRETARY OF ENERGY

pursuant to 42. U.S.C. § 2286a(5)
Atomic Energy Act of 1854, as amended.

Dated: May 21, 1992

The Board is presently completing an investigation of the readiness for resumption of operations at the HB-Line at the Savannah River Site. This investigation raises a number of significant safety issues that the Board believes must be discussed and resolved before the resumption should occur.

Therefore, the Board recommends that:

- DOE defer resumption of processing at the HB-Line for the present, pending issuance of the report of the Board's investigation, resolution of the issues, and possible further Board action.

In order that this matter can be dealt with expeditiously, we are giving high priority to completing the report embodying the results of the investigation.

John T. Conway, Chairman

APPENDIX A

RECOMMENDATION 92-2
FACILITY REPRESENTATIVE PROGRAM AT DEFENSE NUCLEAR FACILITIES

(6 PAGES)

DEFENSE NUCLEAR FACILITIES
SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004
(202) 208-6400 • FTS 268-6400

May 28, 1992

The Honorable James D. Watkins
Secretary of Energy
Washington, DC 20585

Dear Mr. Secretary:

On May 28, 1992, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(5), unanimously approved Recommendation 92-2 which is enclosed for your consideration. Recommendation 92-2 deals with DOE's facility representative program at defense nuclear facilities.

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

Enclosure

RECOMMENDATION TO THE SECRETARY OF ENERGY
pursuant to 42 U.S.C. § 2286a(5)
Atomic Energy Act of 1954, as amended.

Dated: May 28, 1992

Department of Energy (DOE) Order 5000.3A, Occurrence Reporting and Processing of Information, establishes a policy "to assure that both DOE and DOE contractor line management, including the Office of the Secretary, [be] kept fully and currently informed of all events which could affect the health and safety of the public." As a central feature of the measures used to implement this policy, the order defines the position "DOE Facility Representative" as follows:

> "DOE Facility Representative. For each major facility or group of lesser facilities, an individual . . . assigned responsibility by the Head of the Field Organization for monitoring the performance of the facility and its operations. This individual shall be the *primary point of contact* with the contractor and will be responsible to the appropriate Program Secretarial Officer (PSO) and Head of Field Organization. . . ." [emphasis added]

In addition, DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities, directs that "operations at DOE facilities be . . . conducted in a manner to assure an acceptable level of safety," and specifies that DOE Facility Representatives be "assigned responsibility [to] oversee the day-to-day conduct of operations . . . in accordance with . . . direction received from the Program Manager." Secretary of Energy Notice SEN-6E-92, Departmental Organizational and Management Arrangements, extends this chain of responsibility, holding Program Managers accountable to Program Secretarial Officers (PSOs), who in turn are "accountable to [the Secretary] for their respective programs, including safety of the workers and the public. . . ."

Recognizing the importance of these positions with regard to assuring adequate protection of the public health and safety at DOE defense nuclear facilities, the Board reviewed existing department-wide guidance on the selection, training and responsibilities of DOE Facility Representatives. DOE Order 5000.3A and DOE Order 5480.19 (both cited above), provide only limited details concerning DOE Facility Representative duties and responsibilities; moreover, there are no orders that prescribe any guidance for selection and training of DOE Facility Representatives, nor any effective guidance for establishing the duties and responsibilities associated with these positions. (See Attachment A)

Having made numerous reviews throughout the DOE defense nuclear facilities complex, the Board notes that the DOE managers for several facilities in the defense nuclear complex have begun to establish formal Facility Representative programs. However, these programs are operating without centralized direction. Generally, this is resulting in widely differing qualifications, duties, and responsibilities for DOE Facility Representatives from facility to facility, even at the same site. For example, DOE Facility Representatives encountered by

the Board have ranged from personnel holding doctoral degrees to summer interns (college students).

This situation could result in failure by DOE to achieve the level of technical vigilance necessary to assure the safe operation of the department's defense nuclear facilities. The Board believes that the performance of the interrelated safety, technical, and management functions by DOE Facility Representatives would be enhanced if a formal qualification program for these positions, commensurate with their importance, was promulgated at the department level and implemented throughout the defense nuclear facilities complex.

Therefore, the Board recommends that for defense nuclear facilities:

1. The Secretary of the Department of Energy expeditiously carry out a comprehensive analysis of the existing DOE Facility Representative programs.

   a. The analysis should be conducted under the direction of a senior individual who has demonstrated high technical and managerial ability and has demonstrated an understanding of the use of facility representatives.

   b. The analysis should emphasize the identification of those aspects of the existing programs that either support or impede the achievement of DOE objectives for assuring the protection of public health and safety. Consideration should be given to evaluating:

      (1) Qualification requirements and recruitment practices employed in selecting prospective DOE Facility Representatives;

      (2) General and facility-specific training and examination requirements and practices necessary to prepare prospective DOE Facility Representatives for field assignments, and to maintain their proficiency;

      (3) DOE Facility Representative duties and responsibilities;

      (4) Existing supervision and management of the Facility Representative position, now provided by several individuals in some facilities, especially inquiring whether there are clear lines of responsibilities with both the contractor and DOE line management;

      (5) Criteria and practices for assigning DOE Facility Representatives to each defense nuclear facility; and

      (6) DOE personnel practices and procedures that provide incentives and impediments to making the position of DOE Facility Representative attractive and career-enhancing. At a minimum, restraints imposed by the practice of measuring responsibility predominantly in terms of numbers of individuals supervised should be addressed.

c. The analysis should identify practices employed in successful Facility Representative programs outside of the defense nuclear facilities complex that are appropriate for the DOE Facility Representative Program.

d. At the conclusion of the analysis, an estimate should be prepared of the personnel and management resources that would be required to establish and maintain an effective DOE Facility Representative Program, and which reflects the results of the analysis.

2. Utilizing the results of the comprehensive analysis, the Secretary of the Department of Energy establish a formal program to select, train, and assign DOE Facility Representatives for the defense nuclear facilities.

a. In establishing this program, DOE should be prepared to modify personnel practices and programs as necessary to establish a beneficial and effective DOE Facility Representative Program.

b. This program should give consideration to:

(1) Delineating DOE Facility Representative selection requirements, including specified standards of educational achievement, professional experience, technical aptitude, and forcefulness;

(2) Establishing DOE Facility Representative training requirements, including a formal centralized core training program, a formal site- and facility(s)-specific training program, and a continuing education and improvement program, each including periodic objective examinations;

(3) Defining DOE Facility Representative duties and responsibilities, both generically and with regard to each facility in every mode of operation including transition states such as between PSO's; and

(4) Establishing formal requirements to specify those activities or facilities requiring the assignment of DOE Facility Representatives.

John T. Conway, Chairman

ATTACHMENT A

REVIEW OF DOE FACILITY/SITE REPRESENTATIVE POSITION DESCRIPTIONS

The DNFSB staff has reviewed several current or proposed position descriptions, defining the duties and responsibilities of DOE Facility/Site Representatives at Savannah River, Richland, Idaho National Engineering Laboratory (INEL), Rocky Flats, and the Waste Isolation Pilot Plant (WIPP). Based on these position descriptions, there appears to be a wide disparity in the duties and qualifications for DOE Facility/Site Representatives from facility to facility. The lack of any effective guidance in establishing the duties and responsibilities associated with these positions is supported by the following observations.

The position description for the Facility Representative, WIPP Project Office, (General Engineer GM-801-13) most closely tracks the definition of a "DOE Facility Representative" as defined in DOE Order 5000.3A. The position description properly summarizes the major duties of the facility representative as follows:

> "Conducts daily on-site evaluation of contractor operations with emphasis on personnel health and safety, nuclear safety, environmental protection, facility modifications and maintenance, and formality of operations. Assures safe operations at the facility at all times. This is accomplished by frequent walk-through inspections of all facility spaces, observation of facility activities, and continuous interface with contractor personnel at all levels. Deficiencies or concerns are resolved directly with the contractor Facility Manager (with timely appropriate notification to DOE management of the actions taken) or, as necessary, are elevated through DOE line management up to the Operations Office Manager and the Headquarters Program Manager.
>
> "Serves as the primary conduit of information concerning facility operations for DOE management. Maintains awareness of all activities, ongoing and planned, at the facility through discussions with personnel at all levels, through participation in meetings on daily operations and problem resolution, as well as short and long range planning, and through problem identification and resolution resulting from interfacing with personnel at all levels on walk-through inspections and observation of operations. Is responsible for assuring that inspections, observations, and discussions are sufficiently frequent and timely to ensure current knowledge of operations at all times.
>
> "Is normally the first point of contact for DOE in all event notifications and is available to respond to the facility around-the-clock. Serves as the primary DOE expert regarding operational activities and problem identification and resolution."

In contrast, the position description for the Site Representative, Chemical Processing Plant Branch, INEL, includes the following definition of duties:

> "Performs surveillance of the facilities to assure that work is being done in accordance with applicable safety standards and specifications, and approved operating and work control procedures. Facility shutdown authority rests with the Assistant Manager for Nuclear Programs. The Site Representative may exercise this authority, after contacting the AM/NP, when in his opinion, operations may result in undue risk to health, safety, or the environment. If time permits, such action will be coordinated with the MPD Director, AM/ES&H, and ID manager. In cases other than imminent danger, the Site Representative will first bring the matter to the attention of facility management. If resolution is not reached, the Site Representative will go through normal DOE-ID line management for directing any change in operations."

The level of knowledge required of individuals assigned to these positions varies widely among the position descriptions reviewed. All of the position descriptions suffer from a lack of specificity as to how an applicant or an incumbent in these positions will be required to demonstrate his or her proficiency in meeting any of the "Knowledge Requirements" stated in the position description. In fact, no level of educational achievement is cited in any of the position descriptions. The Facility Representative position description for the WIPP Project Office does cite a Professional Engineer license as being highly desirable, but not required. This position description also establishes several performance criteria, including:

> "the ability to complete training on safety and environmental regulatory issues, and to apply general and site-specific training toward the demonstration of detailed knowledge of safety-related systems design basis, functions, and operational characteristics."

The position descriptions reviewed are not consistent in the assignment of responsibilities and compensation incentives. It is not readily discernable as to how certain DOE Facility/Site Representatives are given General Schedule classifications (e.g. GS-13) whereas selected DOE Facility/Site Representatives are included in the DOE Performance Management Recognition System. This latter system, based on the concept of pay for performance, is used for individuals assigned to supervisory or policy influencing positions. A convincing argument can be made that a DOE Facility/Site Representative influences the operational policies and procedures for assigned facilities and, therefore, should be assigned to this pay for performance incentive system.

APPENDIX A

RECOMMENDATION 92-3
SAVANNAH RIVER SITE HB-LINE OPERATIONAL READINESS REVIEW (ORR)

(3 PAGES)

SAFETY BOARD
625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004
(202) 208-6400 • FTS 268-6400

May 29, 1992

The Honorable James D. Watkins
Secretary of Energy
Washington, DC 20585

Dear Mr. Secretary:

In accordance with 42 U.S.C. § 2286a(2) the Board has conducted an investigation of DOE and contractor activities at the HB-Line at the Savannah River Site. Pursuant to that investigation which is drawing to a close, the Board sent to you Recommendation 92-1 by letter dated May 21, 1992.

In furtherance of that recommendation, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(5), unanimously approved Recommendation 92-3 which is enclosed for your consideration. Recommendation 92-3 deals with operational readiness reviews for the HB-Line at the Savannah River Site, Aiken, South Carolina.

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

John T. Conway
Chairman

Enclosure

RECOMMENDATION 92-3 TO THE SECRETARY OF ENERGY
pursuant to 42 U.S.C. § 2286a(5)
Atomic Energy Act of 1954, as amended.

Dated: May 29, 1992

As indicated in our recent Recommendation 92-1, the Board is continuing its oversight and investigation of health and safety issues related to the proposed resumption of plutonium processing in the HB-Line at the Savannah River Site, South Carolina. Our review of Department of Energy (DOE) and contractor documents, as well as other information obtained during the investigation to date, leads the Board to conclude that the Operational Readiness Review (ORR) of the HB-Line conducted by Westinghouse Savannah River Company (WSRC) during the summer of 1991, and DOE's subsequent review called an "ORE", were premature, limited in scope, and inadequate. Moreover, some of the conclusions reached seem suspect. The Board was particularly concerned that some safety issues requiring resolution prior to resumption of operations (Category 1) were reclassified as post-resumption issues (Category 2), without the concurrence of certain DOE team members, raising a question regarding the supportability of the findings. The ORRs did not ensure adequate resolution and closure of safety and health issues associated with the HB-Line, which had not been operated since 1987. When attempts were made to resume operations in the HB-Line during the summer of 1991, following the ORRs, a series of radiological exposures to workers and other safety incidents occurred, causing operations to be suspended. In October of 1991, the HB-Line resumed operations until March of 1992, when operations were again suspended due to an unreviewed safety question. The Office of Nuclear Safety's review, as well as other assessments of HB-Line, identified safety issues which still have not been resolved.

The Department has placed a priority upon safely resuming HB-Line operations to meet commitments made to NASA. While recognizing that the HB-Line may not pose an undue risk to the off-site public, the Board remains concerned with protection of on-site personnel, since an adequate assessment of operational readiness has not been conducted, nor has an adequate assessment of an accidental ground level release been performed.

The Board has determined that the conduct of adequate and thorough ORRs by WSRC and DOE are essential for identifying and resolving remaining health and safety issues affecting workers, and at the same time promptly achieving readiness for restart.

Therefore, the Board recommends that, prior to resuming operations in the HB-Line:

1. DOE direct WSRC to reopen its ORR, and that WSRC and DOE conduct adequate ORRs in accordance with previous Board recommendations and DOE implementation plans for ORRs at other facilities.

2. Comprehensive criteria documents be established for judging and measuring readiness to restart. The criteria documents should include the bases for judging which safety issues must be resolved prior to resumption, and which issues may be deferred for resolution subsequent to restart.

3. WSRC issue a Readiness to Proceed Memorandum requesting DOE approval for resumption of operations after WSRC has completed its ORR and has determined that safety issues appropriate for closure prior to resumption have been adequately resolved.

4. DOE provide whatever assistance it deems appropriate to WSRC during the contractor's conduct of its ORR, recognizing that such assistance is separate and distinct from DOE's subsequent and independent execution of its own ORR.

5. A DOE ORR team, including a Senior Advisory Group, conduct an independent and comprehensive ORR for HB-Line after (a) WSRC has conducted an adequate ORR and issued a Readiness to Proceed Memorandum requesting DOE approval for resumption of operations, and (b) DOE has sufficient reason to believe that significant deficiencies affecting the resumption and safe operation of HB-Line have been corrected by the contractor.

6. The DOE ORR team consist of experienced individuals whose backgrounds collectively include all important facets of the operations involved; that the majority of the team members be independent of HB-Line direct line management responsibilities to ensure an independent and unbiased assessment.

7. In preparing for the Operational Readiness Reviews for the HB-Line, DOE and WSRC should reexamine the HB-Line Safety Analysis Report (SAR) to ensure that: (a) the accident analyses adequately consider all credible scenarios; (b) all appropriate engineered safety systems which are necessary to prevent accidents or mitigate the on-site and off-site consequences of those accidents are identified; and (c) the information obtained from the updated Fire Hazards Analysis is consistent with the accident analyses.

8. WSRC and DOE should complete their assessment of compliance with DOE safety orders at HB-Line, and finish their review, approval, and implementation of any compensatory measures that are necessary and appropriate to achieve the objectives of order compliance and safe resumption of operations at HB-Line.

John T. Conway, Chairman

APPENDIX A

RECOMMENDATION 92-4
DESIGN OF THE MULTI-FUNCTION WASTE TANK FACILITY AT HANFORD

(4 PAGES)

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004
(202) 208-6400 • FTS 268-6400

July 6, 1992

The Honorable James D. Watkins
Secretary of Energy
Washington, DC 20585

Dear Mr. Secretary:

On July 1, 1992, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(5), unanimously approved Recommendation 92-4 which is enclosed for your consideration. Recommendation 92-4 deals with the Multi-Function Waste Tank Facility at the Hanford Site.

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

Enclosure

RECOMMENDATION 92-4 TO THE SECRETARY OF ENERGY
pursuant to 42 U.S.C. § 2286a(5)
Atomic Energy Act of 1954, as amended.

Dated: July 6, 1992

As required by the Atomic Energy Act, the Defense Nuclear Facilities Safety Board (DNFSB), conducts reviews and evaluations of the design of new Department of Energy defense nuclear facilities before and during their construction. Under this statute, the DNFSB is also required to recommend to the Secretary of Energy, within a reasonable time, such modifications of the design as the DNFSB considers necessary to ensure adequate protection of public health and safety.

The Board has performed reviews of the Multi-Function Waste Tank Facility (MWTF) project to be located at the Hanford Site in the State of Washington. The MWTF is an element of the Hanford Tank Waste Remedial System (TWRS) Program which eventually will provide for the ultimate treatment and disposal of the Hanford Site tank waste. We have reviewed information received in the form of briefings and presentations by DOE Headquarters personnel, DOE Richland personnel, Westinghouse Hanford Company personnel, and Kaiser Engineers Hanford personnel as well as analysis of relevant documents. The Board's reviews to date have been concerned with such matters as the application of standards, including DOE orders and directives, and commercial nuclear industry practices as well as other aspects of the project which relate to ensuring adequate protection of the health and safety of the public.

The conceptual design of the MWTF project is now nearing completion. The Board believes that it is appropriate at this time to assure that the design of the MWTF and other new defense nuclear facilities incorporates engineering principles and approaches, detailed engineering criteria, and practices that are essential to ensure adequate protection of public health and safety. These include:

- The design needs to be appropriately conservative with respect to safety.

- The design bases (criteria) need to be clearly defined, coherent, and compatible with the facilities' perceived lifetime functions (i.e., Functional Design Criteria) and documented.

- The design bases and the resulting facility design need to reflect and incorporate the requirements of appropriate standards as that term is used in the Board's enabling statute and thus including DOE orders and directives and commercial nuclear practices, as well as any other factors that may be required for the safe and reliable operation of the facility throughout its entire life.

- The design, construction, and start-up activities need to be performed by those who will ensure the completed project is of the quality necessary to provide adequate protection of public health and safety.

- The design effort needs to be organized such that there is continuity through all phases (conceptual design, preliminary design, final design, construction, testing...) so that all aspects of the process that affect safety are clearly delineated and that line responsibility is clear.

- The DOE organization responsible for the project needs to have technically qualified personnel in numbers sufficient to provide direction and guidance to contractors performing all phases of the effort and to assess the effectiveness of contractor efforts.

- The project organization and operations need to reflect a clear and effective chain of command with responsibility, authority, and accountability clearly defined and assigned to individuals within the respective project organizations.

- The functions and responsibilities of all DOE and contractor organizations involved in the project need to be delineated in writing in a single document.

The Board's view of the Hanford MWTF's conceptual design performed to date is that the design does not clearly present and delineate those aspects that ensure that the public health and safety can adequately be protected. In particular, the MWTF appears to be a project 1) without a well-defined mission or functional requirements (e.g., waste treatment or storage), 2) predetermined to consist of four one-million-gallon tanks regardless of their intended uses, and 3) managed without sufficient regard for technical issues and engineering involvement. The continuing phases of the design and construction are about to begin and the Board seeks to be assured that the design of the tanks as they are built incorporates the appropriate levels of nuclear safety. Further, the Board recognizes that many of the nuclear safety concepts and assurances would normally be provided in the series of facility Safety Analysis Reports and would include design bases, safety system analyses, analysis methods and accident analyses. However, to ensure that appropriate nuclear safety characteristics are included in the design efforts, the Board recommends the following to the Secretary of Energy:

1. Establish a plan and methodology that results in a project management organization for the MWTF project team that assures that both DOE and the contractor organization have personnel of the technical and managerial competence to ensure effective project execution. This should emphasize management aspects of the project necessary to ensure adequate protection of public health and safety and should include the integration of professional engineering and quality assurance as necessary into the project, the application of appropriate standards and approved Department of Energy requirements, and the establishment of clear lines of responsibility and accountability.

2. Identify the design bases and engineering principles and approaches for the MWTF project that provide the data and rationale to show that the design for the MWTF conservatively meets the quantitative safety goals described in the Departments' Nuclear Safety Policy (SEN-35-91). The Board believes that this would include items related to standards, identification of safety related items, detailed design bases, functional design criteria, and safety analyses.

John T. Conway, Chairman

APPENDIX A

RECOMMENDATION 92-5
DISCIPLINE OF OPERATIONS IN A CHANGING DEFENSE NUCLEAR FACILITIES COMPLEX

(4 PAGES)

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004
(202) 208-6400 • FTS 268-6400

August 17, 1992

The Honorable James D. Watkins
Secretary of Energy
Washington, DC 20585

Dear Mr. Secretary:

On August 17, 1992, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(5), unanimously approved Recommendation 92-5 which is enclosed for your consideration. Recommendation 92-5 deals with Discipline of Operation in a Changing Defense Nuclear Facilities Complex.

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

Enclosure

RECOMMENDATION 92-5 TO THE SECRETARY OF ENERGY
pursuant to 42 U.S.C. § 2286a(5)
Atomic Energy Act of 1954, as amended.

Dated: August 17, 1992

The changes in defense-related plans in the Department of Energy are beginning to have a profound effect on the activities directed to systematic upgrading of the conduct of operations at defense nuclear facilities, plans that have often been discussed between the Board and its staff, on the one hand, and members of your staff on the other.

The Rocky Flats Plant presents an excellent example of the major changes being made by DOE while reconfiguring the nuclear weapons complex. It had been planned that as the Rocky Flats Plant moved toward resumption of production of plutonium components of nuclear weapons, a succession of facilities would be readied for renewed operation, beginning with Building 559 (the analytical chemistry laboratory), and followed by Building 707 and then others. This process was to include systematic upgrading of the quality of operations in each case, including Operational Readiness Reviews by the contractor and by DOE to verify that the desired improvements had been accomplished by line management. Resumption of operations is now proceeding in Building 559, in accordance with this process and following the path proposed in your Implementation Plan for the Board's Recommendations 90-4 and 91-4.

You have announced, however, that in light of international developments, plutonium production operations will not be resumed at the Rocky Flats Plant, and future activities there will be confined to cleanup and decontamination of the site, decommissioning of some facilities and parts of others, and placing of some facilities and parts of others in a state of readiness for resumption of operations in the future in the event such a step should be needed. Thus for most facilities at Rocky Flats there is now a major change from the mission and activities previously planned and for which the Board's Recommendations and your implementation plans specific to the Rocky Flats Plant were to be applied, for those recommendations were predicated upon resumption of plutonium production.

At a number of other defense nuclear facilities, similar changes are taking effect. Many facilities are now scheduled for cleanout, shutdown, and decommissioning. Some are to be devoted to aspects of cleanup and decommissioning of sites and of facilities located within sites. Some are slated to be placed in a standby mode, available for restart at a later date if needed. Some are to be continued in operation either in reduction of the stockpile of nuclear weapons or in the maintenance of a reduced stockpile and improvement of its safety.

Some of these facilities have been inactive for long periods of time. Some are to become involved in operations that differ from past usage. Experience shows that when operations are resumed at a facility that has been idle for an extended period, or a facility is operated in a new mode, there is an above-average possibility of mistakes, equipment failures, and violations of safety requirements, that could cause accidents. We believe that special

attention is needed at such times. The appropriate measures to be followed depend on specific features of the facility, the nature of the planned campaign of use, and the long-term plan for the facility. For example, one needs to know if further campaigns are likely, of the same or different kinds; if the facility is to be decommissioned after the planned use; or if it is to be placed in a standby mode.

The Board has found, through experience at the Savannah River Sites and the Rocky Flats Plant and other defense nuclear facilities, that an extended period of time has been required at major facilities to develop an acceptable style and level of conduct of operations. Accomplishing the cultural changes you have required and meeting safety standards comparable to those required of the civilian nuclear industry remains an ongoing challenge. Major improvements have been necessary including development of configuration control, revised and acceptable safety analysis, revised Limiting Conditions of Operation derivative from the safety analysis, operating procedures consistent with the configuration and the safety analysis, and training and qualification of operators for the new mode of operation. Continued improvement has been sought by the Board.

The Board has been informed that DOE does not intend to devote equivalent time and resources to improving the quality of operation at a facility being restarted only for a short campaign or intended for use only in a short campaign in a different mode, but would on a cost-benefit basis use a graded approach, always being sure, however, to take whatever compensatory and other measures are needed to ensure the acceptable level of safety.

The definition and exposition of a graded approach as it is meant to be used in ordering the conduct of operations have not been provided. In discharging its responsibilities in the context of the new defense-related plans of the Department of Energy, the Board intends to carefully review future operations at defense nuclear facilities on a case-by-case basis, starting in each instance from the best information as to the intended future use of the facility. Any proposals to use special measures or controls to compensate for deviations from those ordinarily used to achieve high quality conduct of operations will be closely scrutinized.

Therefore, it is requested that as you decide the future status of individual defense nuclear facilities you inform the Board, designating which ones are to continue in operation and their mission, which are to be shut down for decommissioning within a short time period, which are to be used for an extended time period and then shut down for decommissioning, and which are to be moved to a standby mode (along with the schedule for this).

Regardless of the category, the Board believes that operation and maintenance of defense nuclear facilities in all modes should be in accordance with the Nuclear Safety Policy statement that you issued on September 9, 1991 as SEN-35-91, and the safety goals stated therein.

The Board also believes that, to the extent practicable, facilities that are to be shut down and decommissioned should be cleaned up, and hazards from radiological exposures sufficiently reduced that access can be made freely without need for precautions against radioactivity, and facilities meant for standby status should be placed in such a condition that sudden need to reactivate them would not subject a new operating group to unacceptable radiation hazards.

In furtherance of this view it is recommended that:

1. For defense nuclear facilities scheduled for long term continued programmatic defense operations[1] or for other long term uses such as in cleanup of radioactive contamination or in storage of nuclear waste or other nuclear material from programmatic defense operations, the Department of Energy should institute a style and level of conduct of operations comparable to that toward which DOE has been working at Building 559 at the Rocky Flats Plant and the K-Reactor at the Savannah River Site, and which is at least comparable to that required for commercial nuclear facilities, addressing at a minimum the areas referred to above in connection with style of conduct of operations.

2. Where a facility, after a long period of idleness for whatever reason, is being readied for new use or reuse, special care should be taken to ensure that the line organization, both DOE and contractor, has the technical and managerial capability needed to carry out its responsibilities. Appropriate and effective Operational Readiness Reviews should be conducted by the contractor and by DOE before restart of the facility, to establish confidence that line management has provided satisfaction of safety requirements. Where national security requirements lead to urgent need to restart such facilities before necessary upgrades can be fully completed, compensatory measures should be instituted and their adequacy in ensuring the desired level of safety should be confirmed through appropriate independent review.

3. For facilities designated for the various other future modes of use (such as standby), DOE should undertake to develop specific criteria and requirements that ensure meeting the safety goals enunciated in your Nuclear Policy Satement (SEN-35-91). Accomplishment of these criteria and requirements by line management should be confirmed by appropriate independent review.

John T. Conway.

John T. Conway, Chairman

[1] This term is meant to encompass research, development, and production for defense purposes, and operations related to testing, assembly, disassembly, and storage of nuclear weapons and nuclear weapons components.

APPENDIX A

RECOMMENDATION 92-6
OPERATIONAL READINESS REVIEWS

(4 PAGES)

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004
(202) 208-6400 • FTS 268-6400

August 26, 1992

The Honorable James D. Watkins
Secretary of Energy
Washington, DC 20585

Dear Mr. Secretary:

On August 26, 1992, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(5), unanimously approved Recommendation 92-6 which is enclosed for your consideration. Recommendation 92-6 deals with Operational Readiness Reviews.

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

Enclosure

RECOMMENDATION 92-6 TO THE SECRETARY OF ENERGY
pursuant to 42 U.S.C. § 2286a(5)
Atomic Energy Act of 1954, as amended.

Dated: August 26, 1992

Several of the Board's Recommendations to you have referred to Operational Readiness Reviews, and some have been specifically directed to such activities. In this way, the Board has shown that it holds these reviews, whether by the contractor or by DOE, in high regard as important measures in verifying readiness of new activities to be started safely or of previously conducted activities to be safely resumed after an appreciable hiatus.

The Board recognizes that the actual operation of defense nuclear facilities is accomplished through defense contractors. While first line responsibility for safe operation is in effect delegated through contract provisions, such delegation does not relieve DOE management of its responsibility for ensuring that the operation will be protective of public health and safety. It is the Board's firm conviction that adequate protection of the public health and safety must be achieved through sustained exercise of vigilance by line management of DOE and the contractor.

The Operational Readiness Review is a process undertaken after the intermediate level of line management has arrived at its conclusion that a state of readiness has been achieved for safe startup of the activity. It is a means whereby top management in the contractor organization and/or DOE can then arrive at the independently determined conclusion that this readiness exists. If the line organizations that have been delegated responsibility for preparing a facility for operation have performed effectively, findings of any shortfalls are expected to be few, and of such a character that they can be remedied in short order and on a scheduled basis prior to startup.

In this vein, the Board has recognized the laudable advance toward definition of ORR requirements made in SEN-16B-91, "Approval for Restart of Facilities Shut Down for Safety Reasons and for Startup of Major New Facilities", dated November 12, 1991, and the attached "Process for Secretary Approval of Nuclear Facility Restart or Startup". However, we believe that guidance could be improved by specifying the required features of a satisfactory ORR, and by stating specifically on what occasions an ORR will be required.

Some of the Board's Recommendations have also reflected recognition that conducting an Operational Readiness Review prematurely, before line management responsible for preparing a facility for operation has concluded on a sound basis that readiness has been achieved, has adverse effects on safety. Among these are:

(a) It masks possible lack of competence and other defects in contractor and/or DOE line management.

(b) It becomes a management tool for achieving readiness to proceed safely rather than verifying it. In this way it becomes a crutch for line management.

(c) It postpones discovery of safety deficiencies which effective line management would have identified earlier.

(d) It encourages resort to actions which compensate for safety deficiencies, instead of correcting them.

(e) It vitiates the value of the Operational Readiness Review as a means of independent confirmation of readiness.

The Board believes that among the features of an acceptable ORR are the following:

(a) The review team should not include, as senior members, individuals who are responsible for accomplishing the work being reviewed.

(b) When the contractor performs an ORR, it and the DOE's ORR should be carried out in serial fashion, and the latter should not begin until the contractor has informed DOE in writing that the facility is ready to commence operation.

(c) The criteria governing the review should include the scope of the review and the factors to be used by individual technical experts in judging satisfactory performance.

(d) The DOE review should include assessment of the technical and managerial qualifications of those in the DOE field organization who have been assigned responsibilities for direction and guidance to the contractor, including the Facility Representative. A similar review should be made of the qualifications of contractor personnel responsible for facility operations.

(e) The review team should be required to reach a conclusion as to whether the facility will be operated in conformance with applicable DOE orders, directives, and Secretary of Energy Notices; and that any nonconformances or Compliance Schedule Approvals have been justified in writing, have been formally approved, and in the opinion of the review team do not unduly diminish protection of the public health and safety, including worker safety.

The above being recognized, the Board recommends that:

(1) DOE expeditiously develop an effective set of rules, procedures, orders, directives, and other requirements to govern safety aspects of the Operational Readiness Review process, subject to the principle that the purpose of such a Review is confirmation of an acceptable state of readiness.

(2) DOE develop specific criteria for when Operational Readiness Reviews are required and when they are not.

(3) The plan for each ORR incorporate the features discussed above as desirable, as well as those that were recommended in the Board's Recommendation 90-4.

John T. Conway, Chairman

APPENDIX A

RECOMMENDATION 92-7
TRAINING AND QUALIFICATION THROUGHOUT THE DEFENSE NUCLEAR COMPLEX

(5 PAGES)

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004
(202) 208-6400

September 22, 1992

The Honorable James D. Watkins
Secretary of Energy
Washington, DC 20585

Dear Mr. Secretary:

On September 22, 1992, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(5), unanimously approved Recommendation 92-7 which is enclosed for your consideration. Recommendation 92-7 deals with Training and Qualification.

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

Enclosure

RECOMMENDATION 92-7 TO THE SECRETARY OF ENERGY
pursuant to 42 U.S.C. § 2286a(5)
Atomic Energy Act of 1954, as amended.

Dated: September 22, 1992

Since its inception, the Defense Nuclear Facilities Safety Board has emphasized that a well constructed and documented program for training and qualifying operations, maintenance, and technical support personnel and supervisors at defense nuclear facilities is an essential foundation of operations and maintenance and, hence, the safety and health of the public, including the facility workers. A substantial portion of the Board's efforts has been devoted to on-site observation and review of personnel and supervisor selection, training, qualification, certification and facility operation.

The Board recognizes and commends DOE's efforts to date to upgrade training programs at its defense facilities. While the Board applauds the effort expended in developing DOE Orders 5480.18A, *Accreditation of Performance-Based Training for Category A Reactors and Nuclear Facilities* and 5480.20, *Personnel Selection, Qualification, Training and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities*, implementation of these Orders to date has been slow and the Board continues to find common deficiencies at most facilities it visits. DOE nuclear facility Maintenance and Operations (M&O) Contractors were required by DOE Order 5480.20 to submit implementation plans called Training Implementation Matrices (TIMs) for each nuclear facility by November 8, 1991. The Order does not contain a time requirement for DOE to approve the TIMs and, for the facilities reviewed by the Board and its staff, DOE has not approved the plans they have received to date.

Until the TIMs are approved, training at defense nuclear facilities is governed by more general requirements contained in DOE Orders on safety (DOE Order 5480.5 *Safety of Nuclear Facilities* and DOE Order 5480.6 *Safety of DOE-Owned Reactors*) that have been in effect since September 23, 1986. Despite the long standing requirements of these Orders, the contractors at the many different facilities evaluated by the Board have not yet, in our view, provided management attention and resources for training and qualification commensurate with the health and safety implications of their defense nuclear programs. Indications at each of these sites demonstrate weaknesses in contractor training programs that have potential negative safety consequences. For example:

- A primary measure of an effective training program is the level of knowledge of the personnel and supervisors. At almost all defense nuclear sites, there are numerous technical personnel and supervisors of defense nuclear activities who do not adequately understand many basic fundamentals of engineering, chemistry, nuclear physics, and radiation protection to the extent required to ensure safe operation or maintenance of the facility to which they are assigned.

- Written examinations at many sites often consist of unchallenging multiple choice and short answer questions which do not adequately assess operator knowledge. Additionally, written operator qualification exams do not effectively correlate fundamental engineering principles with job specific knowledge requirements. As a result, management may not have sufficient information to determine if technical personnel in a defense nuclear facility have achieved a level of expertise required to safely conduct their activities.

As stated in DOE Order 5480.20, Program Senior Officials are responsible for assuming "line management responsibility and accountability for reactor and non-reactor nuclear facility personnel qualification programs." The contractors' lack of effective implementation of DOE Orders concerning training is indicative of the need for more emphasis, direction and guidance on training by line management at DOE Headquarters and Field Offices. For example, the Department has been slow to extend the underlying principles of Board Recommendation 90-1 to other defense nuclear facilities. Recommendation 90-1 called for the development of an effective training program at Savannah River Site K-reactor. It is especially disturbing that despite the successful application of Recommendation 90-1 to K-reactor and the Replacement Tritium Facility, DOE has not improved training of corresponding technical personnel at some other Savannah River Site defense nuclear facilities.

Primarily as a result of assessments conducted by the Board's staff at the Hanford Site, the Pantex Plant, the Savannah River Site non-reactor facilities, the Oak Ridge Y-12 Plant, and the Rocky Flats Plant, but also because of reviews conducted elsewhere in the defense nuclear facilities complex, the Board believes there is a need for DOE to take action to further strengthen training of technical personnel at defense nuclear facilities. While the benefits of training are felt in many ways, the recommendations below are to be seen for their positive effects on assuring public health and safety. Therefore, in keeping with the Board's statutory requirements and recognizing the priority DOE has placed on the facilities listed above, the Board recommends for these sites that:

1. The Department take timely action to expand senior management's involvement in implementing training programs at defense nuclear facilities and to enhance senior management's communication of the importance of effective training and qualification programs to all levels within relevant DOE and contractor defense nuclear facilities organizations, particularly within line organizations. With regard to operations, maintenance, and technical support personnel, the Department should determine what personnel, funding, organizational, or managerial strengthening actions are needed to (a) elevate the priority and importance of training and qualification programs to assure public health and safety; (b) communicate the importance of training and qualification from the highest level of management to all appropriate Department personnel; (c) expand personnel and supervisor training and qualification guidance and increase program resources to facilitate the rapid review,

approval, and implementation of training and qualification programs; and (d) make other changes as are warranted.

2. Where it is found to be necessary, the Department strengthen organizational units responsible for training and qualification at the DOE Field Offices, DOE Area Offices, and contractor organizations responsible for defense nuclear facilities at these sites, especially to include the appropriate technical qualifications of the personnel assigned to defense nuclear activities. The infrastructure, responsibilities, and resources of the training and qualification programs of those organizations need to be strengthened to expedite implementation of existing and additional training and qualification requirements issued by DOE.

3. The Department accelerate efforts internal to DOE to improve training and qualification programs of operations, maintenance, and technical support personnel at defense nuclear facilities. An integral part of this effort should be an assessment of the roles and effectiveness of technical oversight groups to ensure that these groups' reviews, at all organizations and levels within the defense nuclear facilities complex, appropriately recognize the importance of training and qualification to public health and safety. The Department's program should also consider restructuring on-site technical oversight groups to ensure that training and qualification are afforded adequate attention and team members possess the technical expertise necessary to effectively evaluate training and qualification programs of operations, maintenance, and technical support personnel.

4. The Department and its contractors establish and implement measures to improve training and qualification programs of operations, maintenance, and technical support personnel at defense nuclear facilities that embody the principles applied at the Savannah River Site K-reactor in response to Board Recommendation 90-1. These measures, adjusted commensurate with the risk associated with operating each specific facility, should include consideration of elements such as:

   a. Incorporation of appropriate applicable guidance on training and qualification comparable with trade, professional, and industry standards for reactor and non-reactor nuclear facilities. While the Board does not necessarily endorse all guidance contained in these standards, it believes they are important sources of information which can be productively used by DOE in identifying improvements for DOE's programs.

   b. Identification of differences between current requirements and applicable trade, professional, and industry standards and implementation of supplemental measures necessary to compensate for the differences identified until training and qualification programs at defense nuclear facilities achieve a level at least equal to trade, professional and industry standards.

c. Extension of the performance-based training principles described in DOE Order 5480.18A to all defense nuclear facilities. Particularly the requirements to: 1) determine the current level of knowledge of appropriate personnel, supervisors, and managers of technical activities by means of written, oral, and practical examinations covering job specific process knowledge requirements as well as fundamentals concepts required to perform a job in a manner that protects the safety of the worker and the public; 2) delineate the training necessary to ensure that these personnel achieve and maintain the qualifications of their respective positions; and 3) evaluate individuals' knowledge level and training curriculum to ensure that the training program effectively prepares these personnel to safely operate, maintain, or support the facility to which they are assigned.

d. Extension of current continuing training, retention testing, and periodic requalification programs to require these personnel to demonstrate continued improvement with increasing experience.

e. Maintenance of readily accessible, auditable records to identify required training and objectively verify training received by these personnel and supervisors including the degree of success achieved.

We believe it is essential that the Department and its contractors accomplish the above for each DOE defense nuclear facility. The facilities specifically identified in this Recommendation are those which the Board understands to be among those which have high priority within the Department and on which the Board has focused its attention.

John T. Conway, Chairman