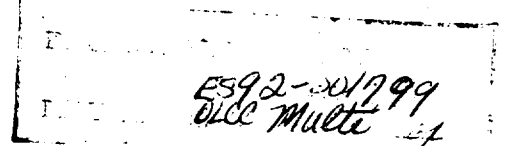




The Secretary of Energy
Washington, DC 20585

February 20, 1992



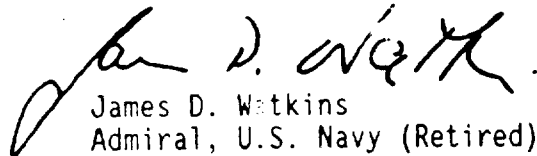
The Honorable J. Danforth Quayle
President of the Senate
Washington, D.C. 20510

Dear Mr. President:

Pursuant to section 316(b) of the Atomic Energy Act of 1954 (42 U.S.C. 2286(b)), the Department of Energy (DOE) is to submit an annual written report to Congress concerning the activities of DOE with regard to recommendations received from the Defense Nuclear Facilities Safety Board. I am pleased to enclose for your information the Department's annual report for calendar year 1991.

In calendar year 1991, the Board submitted six recommendations to DOE. Seven recommendations were submitted for calendar year 1990. I have accepted all of the recommendations. The implementation plans for four recommendations have either been prepared or are already being carried out, and two implementation plans are currently being prepared.

Sincerely,


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

Enclosure

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 Jamie L. Whitten
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 Les Aspin
Chairman
Committee on Armed Services
U.S. House of Representatives
Washington, D.C. 20515

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

The Honorable J. Danforth 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 John W. Warner
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

ANNUAL REPORT
TO CONGRESS

Department of Energy Activities
Relating to the
Defense Nuclear Facilities Safety Board

Second Annual Report -- Calendar Year 1991

January 1992

c. Policy Oversight Group (POG)

On April 24, 1995, the second 93-1/NESSCAP POG met and was chaired by DASMSS. This meeting focused on: potential changes in the Department's nuclear explosive safety standards (NESS); the use of qualitative risk assessments in the nuclear explosive safety process; and the 93-1/NESSCAP schedule. Additionally, programmatic impacts from consolidating nuclear surety orders and nuclear explosive orders into a single nuclear surety program were discussed. In principal, DASMSS agreed to consolidate DOE Orders 5610.10, 5610.11, 5610.13 and 5610.15 into a single nuclear surety order. An implementation schedule or plan of action has not been decided.

d. Impacts of Surety Standard Modifications:

The Department is currently reviewing several options for the policy statements (surety standards) that forms the basis of the NEWS program. These options are being independently reviewed by several groups including the DASMSS Safety, Security, and Control (S²C) Committee, the DASMSS Weapons Panel, and the OIG.

The S²C Committee is chartered by DASMSS to develop a strategic nuclear safety, security, and control (surety) vision. This includes reviewing and recommending changes, as appropriate, to the DOE nuclear explosive safety standards. During the S²C meeting on April 25-26, 1995, the Committee debated several nuclear surety policy alternatives and developed a suggested version that was referred to the POG. The S²C Committee proposal is provided as enclosure 4.

The surety standards will also be considered by the DASMSS Weapons Panel to ensure consistency and adequately describe the overall Departmental goals. Once completed, the revised surety standards will be incorporated in the proposed DOE 5610.10 and 5610.11 Orders.

e. Document Configuration Control:

A configuration control program is being maintained to ensure that the master copy of the proposed orders are not changed without approval of the POG. Under this program, the proposed orders will also receive an administrative review for scope, format, and compliance with the Department's administrative procedures for orders and directives. Any substantial changes will be delayed until the supporting documentation (implementing guides, technical standards, etc.) has been developed sufficiently to permit verification of all actions required under the 93-1/NESSCAP IP.

During the orders preparation process, extensive interactions took place between participating Headquarters elements and field organizations to assure incorporation of nuclear safety requirements applicable to other defense nuclear facilities. A detailed description of this process is provided in enclosure 5. A report of field integration activities, addressing Recommendation 93-1 Action 4 Report tasks. Actions completed on each task is discussed in the attachment to enclosure 5.

E.	Recommendation 91-5, Savannah River K-Reactor Power Limits	21
F.	Recommendation 91-6, Radiation Protection Issues throughout the DOE nuclear facilities complex	22
VI.	DNFSB Advisory/Informational Letters--CY 1991	23
VII.	Assessment	24
VIII.	Departmental Representative to the Defense Nuclear Facilities Safety Board	24
IX.	Conclusions	24

Since Headquarters receipt of the last technical standards will not occur until June 29, 1995, a 1-month extension is required to complete internal reviews. It is our intention to forward all orders, guides, and standards (both final and interim draft copies) to the board on June 30, 1995.

DOE Order 5610.10

SUBJECT: NUCLEAR EXPLOSIVE AND WEAPON SURETY PROGRAM

1. PURPOSE. To establish the top level Department of Energy (DOE) Policy, Responsibilities and Authorities, and Requirements for its Nuclear Explosive and Weapon Surety (NEWS) Program.
2. CANCELLATION. DOE 5610.10, *Nuclear Explosive and Weapon Safety Program*, of 10-10-90 is superseded in its entirety.
3. SCOPE. This Order establishes Nuclear Explosive Surety Standards, Weapon Design Safety requirements, and Appraisal requirements for the DOE NEWS Program. Specific requirements for related elements of the NEWS Program are provided in the 5610-series Orders identified in paragraph 8. Unplanned operations (e.g., Accident Response Group activities) are not addressed in the 5610-series Orders.
4. APPLICABILITY. This Order applies to DOE Headquarters, Field Elements, Contractors, and Subcontractors that manage, oversee, or conduct the NEWS Program, as provided by law and/or by contract as implemented by the appropriate contracting officer.
5. REFERENCES.
 - a. DOE Order 5482.1B, *Environment, Safety, and Health Appraisal Program*, of 11-18-91.
 - b. DOE Order 5610.11, *Safety of Nuclear Explosive Operations*, of TBD.
 - c. DOE Order 5610.12, *Packaging and Offsite Transportation of Nuclear Components, and Special Assemblies Associated with the Nuclear Explosive and Weapon Safety Program*, of 7-26-94.
 - d. DOE Order 5610.13, *Joint Department of Energy/Department of Defense Nuclear Weapon System Safety, Security and Control Activities*, of 10-10-90.
 - e. DOE Order 5610.14, *Transportation Safeguards System Program Operations*, of 5-12-93.
 - f. DOE Order 5610.15, *Nuclear Surety: Security and Control*, of TBD.

training activities that were not explicitly identified in the previous DOE submittals.

In its June 28, 1991, letter, the Board requested additional information on the K-Reactor relating to configuration management. It wanted to ascertain that the as-built configuration of the plant is reflected in appropriate drawings, procedures, and other documents. This information was provided to the Board on August 30, 1991.

Regarding Recommendation 90-1, the Secretary's August 19, 1991, letter to the Congress indicates the implementation of this recommendation cannot be completed in 1 year. It reflects the Secretary's decision to operate only one reactor, the K-Reactor, in the near term and indicates the final implementation plan activities would culminate with the completion of the K-Reactor Operational Readiness Review (ORR) then ongoing. The Board had earlier been provided with detailed information regarding the K-Reactor ORR.

By its November 8, 1991, letter, DOE provided the Board with its revised response and implementation plans for the six elements of Recommendation 90-1. At the same time, the ORR for the K-Reactor was nearing completion. The revised implementation plan, coupled with the frequent interactions of the DNFSB and its staff on the restart training issue, was intended to satisfy the intent of providing periodic updates of the restart training activities.

Since adequacy of operator training is investigated in the ORR, and the ORR has been satisfactorily completed and accepted, Recommendation 90-1 is resolved. This resolution was indicated in a public meeting on December 9, 1991, in Aiken, South Carolina, near the Savannah River Site.

On December 13, 1991, the Secretary authorized restart of the K-Reactor. A copy of this authorization was provided to the Board.

CY 1992 post-recommendation effort will be limited to verification and follow-up matters from the ORR relating to K-Reactor operator training.

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

This Board letter to the Secretary is dated March 8, 1990. The Secretary accepted the recommendation June 8, 1990.

DNFSB Recommendation 90-2 consisted of two elements regarding standards used in the design, construction, operation, and decommissioning of defense nuclear facilities. DOE was to:

1. Identify the safety standards, DOE orders, and other requirements which are applicable to each facility, and provide its view on the adequacy of the standards and requirements and determine the extent to which the standards and requirements have been implemented at the facilities; and
2. Provide its views on the adequacy of the standards identified for protecting public health and safety, and determine the extent to which the standards have been implemented at these facilities.

Although the recommendation was to be evaluated at the Savannah River reactors, the Rocky Flats Plant, the Waste Isolation Pilot Plant, and several facilities at the Hanford site, the Board expressed its view that the Department should eventually accomplish these actions for all defense nuclear facilities under its jurisdiction.

The Secretary's September 14, 1990, letter to the Board provided a supplemental response and implementation plan for Recommendation 90-2.

In accordance with the implementation plan, the Board was provided with bi-monthly reports (December 1990; January, March, and May 1991) on the DOE Order Compliance Programs at the Savannah River Site and the Rocky Flats Plant. In addition, current data bases of codes and standards that apply to the Savannah River Reactors and the Rocky Flats Plant were provided in December 1990 and January 1991. A six volume Rocky Flats Standards Manual was provided in April 1991.

In its May 20, 1991, letter the Board advised DOE that subsequent bi-monthly reports should be improved as outlined in the letter and initial reports on the identified Hanford facilities and the Waste Isolation Pilot Plant should likewise reflect the comments in this letter. The Board reminded DOE that Recommendation 90-2 sets forth three fundamental requirements for the specified defense nuclear facilities: 1) that DOE identify applicable standards; 2) that DOE assess the adequacy of those standards; and 3) that DOE determine the extent of their implementation. It was the stated opinion of the Board that "all three need to be addressed more substantively and in considerably greater detail and depth than is noted in

physical, electrical, and mechanical restraints incorporated in facilities and transport equipment.

- r. Surety. Safety, security, and control of nuclear explosives.

7. POLICY.

The DOE shall maintain a formal, comprehensive, and systematic NEWS program with the primary goal to protect the public and worker health and safety, and the environment.

8. NUCLEAR EXPLOSIVE and WEAPON SURETY ORDERS.

The DOE nuclear explosive and weapon surety program is governed by this Order and the following related DOE Orders:

- a. DOE Order 5610.11, *Safety of Nuclear Explosive Operations, of TBD* establishes the DOE policy, responsibilities and authorities, and requirements for assuring the safe conduct of DOE nuclear explosive operations. It addresses both NES and ES&H.
- b. DOE Order 5610.12, *Packaging and Offsite Transportation of Nuclear Components, and Special Assemblies Associated with the Nuclear Explosive and Weapon Safety Program of 7-26-94*, establishes policy, objectives, responsibilities and authorities, and requirements for the safe packaging and offsite transportation of nuclear components and special assemblies associated with the nuclear weapons program requiring the use of the Transportation Safeguards System (TSS).
- c. DOE Order 5610.13, *Joint Department of Energy/Department of Defense Nuclear Weapon System Safety, Security and Control Activities*, of 10-10-90, establishes the DOE policy, responsibilities and authorities, and requirements for addressing joint nuclear weapon and nuclear weapon system issues in conjunction with the Department of Defense (DoD). It covers DOE participation in DoD Nuclear Weapon System Safety Groups which conduct safety studies of nuclear weapon systems operated by the DoD, and develop weapon system safety rules governing those operations.
- d. DOE Order 5610.14, *Transportation Safeguards System Program Operations* of 5-12-93, establishes DOE policy, responsibilities and authorities, and requirements for the management and operation of the TSS program. The TSS Program covers transportation of nuclear explosives, DOE-owned Categories I and II quantities of special nuclear material, classified configurations of nuclear weapons,

2. A program developed for continuous monitoring of the conditions in the tanks;
3. Use of alarmed indicators for monitoring conditions to aid in decision-making to neutralize any perceived abnormality; and
4. An action plan be developed for the measures to be taken to neutralize the conditions that may be signaled by alarms.

The Secretary's August 10, 1990, letter to the Board provided an implementation plan for Recommendation 90-3.

The Board provided additional concerns regarding the Hanford Waste Tanks in a letter to the Secretary dated October 12, 1990. This letter was taken to be Recommendation 90-7, and the ongoing Recommendation 90-3 activities were incorporated into the implementation plan for 90-7. A discussion of Recommendation 90-7 and, therefore, of Recommendation 90-3 as well is given later in this report.

Subsequent annual reports will only treat this matter as Recommendation 90-7.

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

This Board letter to the Secretary is dated May 4, 1990. The Secretary accepted the recommendation June 20, 1990.

The DNFSB recommendation, based on the Board's extensive review of the Rocky Flats restart effort, calls for an ORR to be carried out prior to resumption of operations. The Board's recommendation requires establishing a group of experienced individuals with backgrounds that collectively include all important facets of the unique operations involved. The review is to include:

1. An independent assessment of the adequacy and correctness of systems operating procedures;
2. An assessment of level of knowledge achieved during operator requalification;
3. An evaluation of records of tests and calibration of safety systems and instruments monitoring Limiting Conditions of Operations or that satisfy Operating Safety Requirements;

4. A verification that all plant changes have been reviewed for impact on procedures, training, and requalification, and such training and requalification have been done using revised procedures; and
5. An examination of each building Final Safety Analysis Report to ensure the description of the plant, procedures, and accident analyses are consistent with the plant as affected by the safety-related modifications that have been made.

On November 29, 1990, the Secretary sent the implementation plan for Recommendation 90-4 to the Board. In its December 21, 1990, letter to the Secretary, the Board suggested specific revisions and changes to the implementation plan. These suggestions were accepted and incorporated in a revised implementation plan sent to the Board on February 15, 1991.

DOE advised the Board that it planned an ORR for the K-Reactor at the Savannah River Site. An initial plan for this ORR was transmitted to the Board on January 16, 1991, along with a commitment to revise the plan in the same way suggested by the Board for the Rocky Flats ORR. Both DOE and the Board are treating the K-Reactor ORR under Recommendation 90-4.

DOE advised the Board, by letter dated June 5, 1991, that Phase I of the K-Reactor ORR was completed. Arrangements were made to brief the Board following completion of Phase III of the ORR. In the meantime, Board staff members have witnessed a good deal of the ongoing ORR. Members of the Board had the opportunity to witness some of the scheduled operator drills on control room situations.

On June 27, 1991, DOE provided the Board with the final report of the EG&G Corporate Operational Readiness Review for Building 559, Plutonium Analytical Laboratory. Subsequent to this contractor ORR, the DOE staff conducted its independent ORR. The results of this DOE review were sent to the Board on August 7, 1991.

At the same time, DOE's Office of Nuclear Safety and Office of Environment, Safety and Health were conducting an assessment of Building 559 relating to oversight of DOE's ORR and whether resumption commitments for Building 559 had been met. The assessment took place over the period April-July 1991. Copies of the assessment report were provided to the Board September 11, 1991. The report was quite comprehensive and contained 49 specific concerns in matters relating to Effectiveness of the ORR, Vital Safety

Systems, Configuration, Criticality Safety, Quality Assurance, Industrial Hygiene/Industrial Safety, Radiation and Chemical Protection, Emergency Preparedness, and Review of Building 559's Safety Analysis Report. Resolution of these concerns will be part of DOE's ORR.

The Operational Readiness Review for the K-Reactor was organized into four functional areas: Operations, Maintenance and Surveillance, Engineering and Technical Support, and Organization and Management. The review was conducted in three phases. Phase I was a program and procedure review to include assessment of the adequacy of programs and policies associated with reactor operations and the organization adequacy of Westinghouse Savannah River Company (the contractor) and DOE with respect to reactor operations. Phase II was a review of procedures, hardware, and personnel to include assessments of technical and administrative procedures, including restart test procedures; surveillance tracking and scheduling; technical specifications; operator competency, including review and observation of oral examinations of selected operators and supervisors; systems and equipment; and DOE Order Compliance. Phase III included review of personnel and hardware performance including performance-based assessment of operators, equipment, support staff, and management programs; evaluation of the performance of DOE's Technical Vigilance Program; evaluation of simulator and in-plant drills and exercises; evaluation of the disposition of the restart test results; and final assessment of composite crew staffing and qualifications.

The Phase I effort extended over the period May 13-24, 1991. The Phase II effort ran from June 10 - August 30, 1991. The Phase III effort covered the period October 7-18, 1991. Much of the effort of Phases II and III resolved the considerations of Recommendation 90-1. The K-Reactor ORR effort was successfully completed in CY 1991. The Rocky Flats ORR effort will go forward in CY 1992.

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

This Board letter to the Secretary is dated May 18, 1990. The Secretary accepted the recommendation June 13, 1990.

DNFSB recommended 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 Board, was a means of evaluating older facilities against current standards. The Board considered it appropriate for Rocky Flats as a mechanism for systematically reviewing,

prioritizing, and integrating various potential facility changes. The Board recommended the Rocky Flats SEP address all outstanding safety issues including the following:

1. Effects of severe external events (particularly seismic and high winds);
2. Effects of severe internal events (particularly fire);
3. Ventilation system performance under severe internal and external events; and
4. The basis and procedures for making backfit decisions on which facility changes identified under the SEP would or would not be made, including the schedule for completion of these improvements.

The Board recommended this SEP be completed "over about the next 4 years."

On October 15, 1990, the Secretary transmitted the implementation plan for this recommendation to the Board and indicated that an SEP would also be undertaken for the Savannah River Reactors (SRR). The implementation plan for SRR was transmitted to the Board March 21, 1991.

It was agreed for the Rocky Flats SEP that DOE would provide quarterly reports to the Board, recognizing this SEP could be expected to extend for several years. The first three quarterly reports were provided to the Board on February 4, 1991, April 30, 1991, and July 31, 1991. The reports indicate that work has been interrupted at times owing to budget deliberations, loss of contract support, and the resumption of priority activities. Notwithstanding, the DOE staff has been working to improve the overall SEP schedule.

On September 27, 1991, DOE provided the Board with its SEP Management Plan along with the contractor's SEP Management Plan and SEP Quality Assurance Plan. This information establishes the elements of the Rocky Flats Systematic Evaluation Program. On October 25, 1991, information relating to Phase I of the SEP, a Topics List and a Topic Evaluation Plan, was provided to the Board, along with the first specific Topic Evaluation Plan: "Wind and Tornado Effects on Structures, Systems, and Components."

On November 6, 1991, the Fourth Quarterly Progress Report was provided to the Board. Work is going forward to complete the topics list, the topic evaluation plans, and

initiate Phase II efforts for Building 559 which is expected in early CY 1992.

Work on the SEP program is progressing in accordance with the implementation plan. The Board has been briefed on the elements of the program.

The effort for Recommendation 90-5 will go forward in CY 1992.

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

This Board letter to the Secretary is dated June 5, 1990. The Secretary accepted the Recommendation July 24, 1990.

DNFSB Recommendation 90-6 addressed criticality safety at Rocky Flats, particularly relating to plutonium accumulation in the ventilation ducts. The Board recommended that, prior to resumption of plutonium operations at the plant, DOE prepare a written plan to address the 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. The program should include:

1. A description of remedial actions deemed necessary prior to resumption of operation;
2. Descriptions and justifications of non-destructive assay techniques;
3. Estimation of radiation levels in areas of occupancy;
4. Determination of the effects of accumulation on the functionality of the ventilation systems which must act to protect the health and safety of the public, including plant operating personnel;
5. Justification of procedures and schedules for removal or reduction of the material in the ducts;
6. Determination of any design or operational changes necessary to prevent further accumulation; and
7. Establishment of a monitoring program for the ducts to ensure that such changes are effective.

On November 29, 1990, the Secretary transmitted the implementation plan for this recommendation to the Board. The plan calls for monthly progress reports to the Board. The Board's December 3, 1991, letter accepts the implementation plan.

The implementation plan involves six individual tasks as follows:

- Task 1: Determination of fissile material accumulation
- Task 2: Evaluation of nuclear criticality safety risk
- Task 3: Evaluation of potential worker radiation exposures
- Task 4: Review of risk assessment and safety analyses
- Task 5: Prevention of fissile material accumulation
- Task 6: Removal of material from ventilation systems

Work on these tasks are reported monthly. The first nine monthly reports were provided to the Board on January 3, February 4, March 4, April 1, May 10, May 31, June 28, August 9, and September 10, 1991. In following the progress on this implementation plan the DNFSB staff routinely has provided comments to DOE. These comments have been addressed separately in subsequent monthly reports.

The implementation plan requires a Pre-Resumption Remediation Report for each plant building. The report for Building 559 was provided to the Board July 19, 1991. It had one issue outstanding which will require a supplement to the report when the issue is resolved.

On October 16, 1991, DOE provided the 10th monthly report to the Board along with Duct Holdup Profiles for Buildings 707, 776, and 771. The 11th and 12th monthly reports were sent to the Board on November 19, 1991, and December 4, 1991, respectively.

Work on Recommendation 90-6 will go forward in CY 1992.

- G. Recommendation 90-7, Safety at the Single-Shell Hanford Waste Tanks.

This Board letter to the Secretary is dated October 12, 1990. The recommendation combines 90-7 with 90-3. The Secretary accepted the recommendation December 3, 1990.

DNFSB Recommendation 90-7 related to previous Board Recommendation 90-3, Hanford Future Tank Monitoring. The Board concluded that the implementation plan for 90-3 was not adequately responsive in that it did not reflect the urgency that was implicit in the Board's recommendation. The Board recommended that the 90-3 implementation plan be modified to:

1. Add necessary instrumentation immediately;
2. Add temperature instrumentation to continuously record readouts and alarms;
3. Add instrumentation to monitor the composition of cover gas in the tanks;
4. Accelerate the program for sampling contents of the tanks;
5. Accelerate the schedule for the program to study the chemical properties and explosive behavior of the waste in the tanks; and
6. Include a new written action plan covering measures that would be taken in the event of an explosion.

On March 7, 1991, the Secretary sent the implementation plan for Recommendation 90-7 to the Board.

In a related matter, section 3137 of Public Law No. 101-510, the National Defense Authorization Act for FY 1991, requires that DOE submit a report to the Congress on Waste Tank Safety Issues at the Hanford Site. This report was submitted to the Congress July 16, 1991.

The implementation plan for Recommendation 90-7 requires quarterly reports to the Board. The first quarterly report, covering the period February 1 - June 30, 1991, was provided to the Board August 16, 1991.

Work on Recommendation 90-7 will go forward in CY 1992.

DOE Order 5610.11

SUBJECT: SAFETY OF NUCLEAR EXPLOSIVE OPERATIONS

1. **PURPOSE.** This Order implements the overall safety objectives of the Department of Energy's (DOE) Nuclear Explosive and Weapons Surety Program (DOE Order 5610.10). The purpose of this Order is to establish the Scope, Applicability, Policy, Responsibilities, Authorities, and Requirements for assuring the safety of DOE nuclear explosive operations and associated activities and facilities, and to protect the environment and the health and safety of workers and the public.
2. **CANCELLATION.** DOE 5610.11, *Nuclear Explosive Safety of 10-10-90* is superseded in its entirety.
3. **SCOPE.** This Order covers the safety of all DOE nuclear explosive operations and associated activities and facilities. Unplanned operations (e.g., Accident Response Group activities) are not addressed in this Order. In the context of this Order, safety is addressed in two broad areas: nuclear explosive safety (NES) and environment, safety and health (ES&H).
4. **APPLICABILITY.** This Order applies to DOE Headquarters, Field Elements, Contractors, and Subcontractors that manage, oversee, or conduct nuclear explosive operations and associated activities, as provided by law and/or by contract as implemented by the appropriate contracting officer.
5. **REFERENCES.**
 - a. DOE Order 4330.4B, *Maintenance Management Program*, February 10, 1994.
 - b. DOE Order 5000.3B, *Occurrence Reporting and Processing of Operations Information*, of 5-30-90.
 - c. DOE Order 5400.5, *Radiation Protection of the Public and the Environment*, Change 2, January 7, 1993.
 - d. DOE Order 5480.11, *Radiation Protection for Occupational Workers*, June 17, 1992, and supporting technical manual *DOE Radiological Control Manual*, April 1994.
 - e. DOE Order 5480.19, *Conduct of Operations Requirements for DOE Facilities*, July 9, 1990.

V.

DNFSB CY 1991 Recommendations

In CY 1991, the Board issued six sets of recommendations. The Secretary accepted four and the two that were received December 19, 1991, are still under review. A description of the six sets of recommendations and the present status of each, is given below.

A. Recommendation 91-1, DOE Nuclear Safety Policy, Standards, Safety Orders and Directives.

This Board letter to the Secretary is dated March 7, 1991. The Secretary accepted the recommendation May 13, 1991, with the agreement of the Board to delay response until that date.

Recommendation 91-1 relates to the Board's review and evaluation of the content and implementation of the standards for design, construction, operation, and decommissioning of defense nuclear facilities. This is one of the Board's statutory functions. In its March 8, 1990, letter, Recommendation 90-2, the Board addressed certain aspects of this subject. DOE has been providing information to the Board on its nuclear safety rulemaking, standards development, and development of nuclear safety DOE Orders. Previously, in November 1990, the Board transmitted to the Secretary copies of a MITRE Corporation report, developed under the Board's direction and guidance, on the subject of DOE standards imposed by Department orders and supplements prepared by DOE's Savannah River Field Office. Consideration of the MITRE report is included in the recommendation.

There are seven individual elements of Recommendation 91-1 as follows:

1. That the Department expeditiously issue a formal statement of its overall Nuclear Safety Policy;
2. That increased attention be given to the qualifications and background of managers and technical staff assigned to the development and implementation of standards and that the numbers of personnel suited to this activity be increased commensurate with its importance;
3. That standards program officials be given direct access to the highest levels of DOE management;

4. That the Department critically reexamine its existing infrastructure for standards development and implementation at Headquarters to determine if organizational or managerial changes are needed to (1) emphasize the priority and importance of standards to assuring public health and safety; (2) expand the program to facilitate the rapid development and implementation of standards; and (3) streamline the DOE approval process for standards;
5. That the Department reexamine the corresponding organizational units at DOE's Field Offices and DOE contractor organizations to determine if those organizations' standards infrastructure, responsibilities, and resources would also benefit from changes to reflect improvements at Headquarters which strengthen and expedite standards development and implementation;
6. That DOE review all the findings and conclusions of both the Executive Summary and of Volume 2 of the MITRE report, identify which findings and conclusions it considers valid and appropriate in DOE's Response to this set of recommendations, and subsequently address those findings and conclusions in the Implementation plan; and
7. That DOE expedite the issuance of revised safety orders, directives, or other requirements as a means of addressing the need for substantive guidance on the wide variety of safety requirements while DOE is promulgating rules.

On May 13, 1991, the Secretary accepted the Recommendation 91-1 and provided responses to the individual elements of the recommendation. On August 15, 1991, the implementation plan for Recommendation 91-1 was forwarded to the Board. The plan commits DOE to respond to the specific conclusions of the MITRE report and describes the study DOE will undertake in response to Recommendation 91-1. The study consists of three major tasks:

- Task 1.0: Critical Evaluation of Standards Development
- Task 2.0: Critical Evaluation of Standards Implementation
- Task 3.0: Develop an Action Plan to Strengthen the DOE Standards Program

On September 9, 1991, the Secretary issued the Department's Nuclear Safety Policy. The Secretary's guiding principles that governed the formulation of the Nuclear Safety Policy were: first, the policy should be understandable to the public; second, the policy should be achievable, recognizing DOE's

essential role in national security matters; and third, the policy should provide a vision for all of the nuclear activities in nuclear facilities that belong to the Department. In short, the Nuclear Safety Policy was to be broad in scope covering issues critical to achieving the safe operation of the Department's diverse nuclear facilities.

Work on Recommendation 91-1 will go forward in CY 1992. The Department is keeping the Board apprised of both progress and the direction of the study by periodic briefings.

B. Recommendation 91-2, K-Reactor Restart: Reactor Operations Management Plan (ROMP).

This Board letter to the Secretary is dated March 27, 1991. The Secretary accepted the recommendation May 14, 1991.

Recommendation 91-2 notes that "the principal safety issues to be resolved in connection with restart of the K-Reactor at the Savannah River Site have been assembled in the ROMP issued by the Savannah River Site contractor and updated on a number of occasions." In the opinion of the Board, the documented closure packages for these safety issues did not contain discussions as to how the work performed resolved an outstanding issue. In addition, the Board was concerned there was a lack of DOE determination to assure itself of resolution of these matters.

In light of the above, the Board recommended:

1. That each closure package of an issue in the ROMP be provided with a brief narrative discussion that clarifies the meaning of the issue, describes the steps taken to resolve it, states the reason for concluding that closure has been achieved, and shows how the referenced documents support the claim of closure.
2. That DOE revert to its earlier plan to fully review and concur with the determinations of each issue closure.

On August 2, 1991, the implementation plan for Recommendation 91-2 was forwarded to the Board. By this time, DOE had forwarded to the Board, 79 of the 231 ROMP closure packages. The implementation plan describes the closure narrative being prepared for each issue as part of the closure package for that issue. These closure packages are submitted to DOE for review and approval. The implementation plan also details the DOE review and approval procedures. The Board is provided copies of the closure packages, closure narratives, and documentation of the DOE review and concurrence following the DOE review process.

By October 4, 1991, DOE had forwarded to the Board, 167 of the 231 ROMP closure packages. The effort to that date had closed out 175 issues. Closeout increased to 197 issues by the end of October and to 207 issues by the end of November.

On December 11, 1991, the Secretary provided the Board with the remaining closure packages and advised the Board that all remaining items had been closed. This completed the effort on Recommendation 91-2.

C. Recommendation 91-3, Readiness Review at the Waste Isolation Pilot Plant (WIPP).

This Board letter to the Secretary is dated April 26, 1991. The Secretary accepted the recommendation June 5, 1991.

Recommendation 91-3 relates to the forthcoming operation of WIPP. The Board noted its concerns, the review of facility readiness was spread over a 3 year period, and DOE did not intend to perform a final comprehensive readiness review, after completion of the contractor's readiness review, prior to the initiation of the test phase for the WIPP facility.

The rather detailed Board recommendation in this regard is the following:

1. That an independent and comprehensive DOE readiness review be carried out at WIPP prior to initiation of the test phase. As indicated in item 2, members of the review team may include some personnel from the line organization;
2. That the team constituted to carry out the readiness review consist of experienced individuals whose backgrounds collectively include all important facets of the unique operations involved and the majority of the team members be independent of WIPP programmatic or line management responsibilities to ensure an independent and unbiased assessment;
3. That the DOE readiness review team confer with the DOE teams that are currently performing readiness reviews at other DOE facilities to determine what procedures for conducting readiness reviews have or have not been effective, recognizing a tailored approach is required for WIPP; and
4. That the review include, but not be limited to, the following items:
 - a. assessment of the adequacy and correctness of waste handling and utility systems normal and abnormal operating and emergency procedures.

- b. assessment of level of knowledge achieved during operator qualification as evidenced by review of examination questions and examination results and by selective oral examinations of operators by members of the review team.
- c. assessment of conduct of operations by observation of actual waste handling operations using simulated waste containers and the response to simulated abnormal and emergency situations.
- d. assessment of the interrelationships and the delineation of roles and responsibilities among the various DOE (Carlsbad and Albuquerque) and contractor (Westinghouse and Sandia National Laboratory) organizations involved in the test phase.
- e. examination of records of tests and calibration of safety systems and other instruments monitoring Limiting Conditions of Operations satisfying Operating Safety Requirements; and
- f. verification of safety system as-built drawings by walkdown of selective systems.

On May 29, 1991, following a briefing by DOE on the WIPP ORR, a Board letter to DOE provided their understanding of some of the principal parts of the ORR. Subsequently, on June 5, 1991, the Secretary accepted Recommendation 91-3.

On August 2, 1991, the implementation plan for Recommendation 91-3 was transmitted to the Board, along with the Secretary's comments on the major points raised in the Board's May 29, 1991, letter.

Upon completion of the review, the ORR team leadership and management met with the DNFSB on August 20, 1991, to discuss the results. On September 25, 1991, the final ORR report was provided by DOE to the Board which completed the requirements set forth in Recommendation 91-3. A public meeting to discuss the ORR team report and its conclusions was held on September 26, 1991, at the Board offices in Washington, D.C.

- D. Recommendation 91-4, Operational Readiness Review of Building 559 at the Rocky Flats Plant.

The Board's letter to the Secretary is dated September 30, 1991. The Secretary accepted the recommendation November 6, 1991.

Recommendation 91-4 supplements Recommendation 90-4 to conduct an ORR for plutonium operations at the Rocky Flats Plant. It relates to Building 559, an analytical chemistry laboratory, the first plutonium operations building scheduled to resume operations. DOE had begun an ORR for Building 559 with a team on-site during April 1-5 and June 24-July 19, 1991. This recommendation relates to the completion of the ORR for Building 559.

The detailed recommendation in this regard is the following:

1. A DOE ORR team, including a Senior Advisory Group, using as many as may still be available of the original members, complete the ORR for Building 559, but only when (a) DOE has adequate reason to believe that the deficiencies it has identified during its original ORR have been corrected or are appropriately near closure with credible timetables toward closure, and (b) EG&G has issued a Readiness to Proceed Memorandum requesting DOE approval for resumption of plutonium operations in the building, subject to scheduled elimination of the deficiencies.
2. The DOE ORR team continue its review consistent with the requirements of Recommendation 90-4 and its implementation plan. Namely, that the review be structured to include, but not be limited to, the following items:
 - a. independent assessment of the adequacy and correctness of process and utility systems operating procedures. Consistent with the contractor's operating philosophy, these procedures should be in sufficient detail to permit the use of the "procedural compliance" concept.
 - b. assessment of the level of knowledge achieved during operator requalification as evidenced by review of examination questions and examination results and by selective oral examinations of operators by members of the review group.
 - c. examination of records of tests and calibration of safety systems and other instruments monitoring Limiting Conditions of Operation or satisfying operating safety requirements.
 - d. verification that all plant changes, including modifications of vital safety systems plutonium processing work stations, have been reviewed for potential impact on procedures, training, and requalification, and training and requalification have been done using the revised procedures.

- e. Examination of each building's Final Safety Analysis Report to ensure that the description of the plant, procedures, and the accident analysis are consistent with the plant as affected by safety related modifications made during the outage period.
3. The DOE ORR team include in its final report a description of remaining issues which require closure, if any, and an overall conclusion of readiness of Building 559 to resume operations.
4. EG&G and DOE complete their assessment of compliance with DOE Safety Orders at Building 559 and their implementation of any compensatory measures needed to achieve the objectives of compliance appropriate for resumption of plutonium operations in Building 559.

The DOE orders, 43 in number, noted in item 4, are the following:

DOE Safety Orders of Interest to DNFSB

<u>Order #</u>	<u>Subject</u>
1. 1300.2	Department of Energy Standards Program
2. 1360.2A	Unclassified Computer Security Program
3. 1360.4A	Scientific and Technical Computer Software
4. 1540.2	Hazardous Material Packaging for Transport - Administrative Procedures
5. 1540.3	Base Technology for Radioactive Material Transportation Packaging Systems
6. 1540.2	Physical Protection of Unclassified, Irradiated Reactor Fuel in Transit
7. 4330.4A	Maintenance Management Program
8. 4700.1	Project Management System
9. 5000.3A	Occurrence Reporting and Processing of Operations Information
10. 5400.1	General Environmental Protection Program
11. 5400.2A	Environmental Compliance Issue Coordination
12. 5400.3	Hazardous and Radioactive Mixed Waste Program
13. 5400.4	Comprehensive Environmental Response, Compensation, and Liability Act Requirements
14. 5400.5	Radiation Protection of the Public and the Environment
15. 5440.1D	National Environmental Policy Act Compliance Program
16. 5480.1B	Environment, Safety and Health Program
17. 5480.3	Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances and Hazardous Wastes
18. 5480.4	Environmental Protection, Safety and Health Protection Standards

19. 5480.5 Safety of Nuclear Facilities
20. 5480.6 Safety of DOE-Owned Reactors
21. 5480.7 Fire Protection
22. 5480.8 Contractor Occupational Medical Program
23. 5480.9 Construction Safety and Health Program
24. 5480.10 Contractor Industrial Hygiene Program
25. 5480.11 Radiation Protection for Occupational Workers
26. 5480.15 Department of Energy Laboratory Accreditation Program for Personnel Dosimetry
27. 5480.17 Site Safety Representatives
28. 5480.18 Training Accreditation
29. 5480.19 Conduct of Operations Requirements for DOE Facilities
30. 5480.20 Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities
31. 5481.1B Safety Analysis and Review
32. 5482.1B Environment, Safety and Health Appraisal Program
33. 5483.1A Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities
34. 5484.1 Environmental Protection, Safety and Health Protection Information Reporting Requirements
35. 5500.1B Emergency Management System
36. 5500.2B Emergency Categories, Classes, and Notification and Reporting Requirements
37. 5500.3A Planning and Preparedness for Operational Emergencies
38. 5500.4 Public Affairs Policy and Planning Requirements for Emergencies
39. 5500.7A Vital Records Protection Program
40. 5500.10 Emergency Readiness Assurance Program
41. 5700.6B Quality Assurance
42. 5820.2A Radioactive Waste Management
43. 6430.1A General Design Criteria

In the November 6, 1991, letter accepting Recommendation 91-4, the Secretary provided the implementation plan for the recommendation. Work on Recommendation 91-4 will go forward in CY 1992.

E. Recommendation 91-5, Savannah River K-Reactor Power Limits

This Board letter to the Secretary is dated December 19, 1991, and is still under review.

The Board requests DOE inform the Board prior to any decision to increase the reactor's power level above 30 percent of the historical value of its maximum full power.

If such an increase is contemplated by DOE, the Board recommends that:

1. DOE conduct more definitive studies on the thermal-hydraulic methodology, criteria, and experimental test program used in analyzing performance of core cooling of the K-Reactor during unusual conditions that could prevail during accidents.
2. Any proposal to operate the K-Reactor at a level above the 30 percent value should be supported by accident analysis based on the thermal-hydraulic methodology revised in accordance with the above.
3. The evaluation model for analysis of postulated loss of coolant accidents should be documented and controlled in accordance with the procedures described in 10 CFR 50.46 (1991).

An initial response will be provided to the Board no later than February 15, 1992.

- F. Recommendation 91-6, Radiation Protection Issues throughout the DOE Defense Nuclear Facilities Complex.

The Board letter to the Secretary is dated December 19, 1991, and is still under review.

The Board recommendation included the following elements:

1. DOE management and leadership in radiation protection programs;
2. Radiation protection standards and practices at defense nuclear facilities;
3. Training and competence of Health Physics technicians and supervisors;
4. Analysis of Reported Occurrences and correction of radiation protection program deficiencies; and
5. Understanding and attention to radiation protection issues by individuals in DOE and its contractor organizations.

VI.

DNFSB Advisory/Informational Letters - CY 1991

In CY 1991, there were two advisory letters from the Board. A May 28, 1991, letter related to the Board's wishes to be advised on all upcoming ORRs planned and/or being conducted at defense facilities prior to start-up. A letter dated July 11, 1991, requested that reports and assessments made of defense facilities be provided routinely for Board review.

The May 28 letter noted that "in order for the Board to fulfill its oversight responsibility for health and safety issues at defense nuclear facilities, we request that the Department of Energy inform the Board whenever the Department or its contractors plan to conduct an ORR for a defense nuclear facility within the Board's statutory jurisdiction." It is the intention of the Board "to review the ORR process at an early stage and make whatever health and safety recommendations are appropriate."

The Secretary responded to the Board's request on June 20, 1991, indicating his agreement with the Board's views on ORRs and directed the Assistant Secretary for Defense Programs and the Assistant Secretary for Environmental Restoration and Waste Management to provide up-to-date information to the Board. A letter dated July 5, 1991, from the Assistant Secretary for Defense Programs, listed 15 facilities that will have an ORR within the next 12 months. A 16th facility was provided to the Board in a subsequent letter dated July 22, 1991. This listing is periodically updated and the results are provided to the Board.

The letter dated July 11, 1991, from the Board noted DOE routinely provides the Board with copies of a number of reports which relate to the nuclear safety of defense facilities. The Board believed it would be helpful to both DOE and the Board if it were provided, on a regular basis, with reports of a summary nature relating to this subject. Specifically, the Board indicated it was interested in reports and assessments prepared by the Office of Nuclear Safety, Tiger Teams, Technical Safety Appraisal Teams, Advisory Committees for Nuclear Safety, Operational Readiness Review Teams, Assistant Secretary for Defense Programs, Assistant Secretary for Nuclear Energy, Assistant Secretary for Environment, Safety and Health, Office of Environmental Restoration and Waste Management, and Office of New Production Reactors.

The Secretary's August 2, 1991, Board response indicated his agreement. He had "tasked the affected Assistant Secretaries, Office Directors, and Field Office Managers to send those reports directly to the DNFSB."

VII. Assessment

Through this second year of working with the DNFSB to resolve its recommendations, DOE believes it has been prompt and responsive to the Board's concerns. The Board, for its part, has never been hesitant in expressing any dissatisfaction it might feel concerning any DOE response. DOE, for its part, has always reacted to any Board critical reaction with better information and more focused programs in order to provide the Board what it needs to be able to judge the effectiveness of defense nuclear safety.

Although the principal concerns of the Board are expressed through sets of recommendations, DOE treats requests for information or other advisory/informational letters from the Board as if they were recommendations and has responded to such requests accordingly.

In CY 1991, DOE has committed necessary resources to satisfy Board requirements. It will continue to do so. Many of the Board's recommendations are acknowledged to take several years for resolution. Thus far, in the second year of the Board's existence, DOE has closed out three recommendations (Recommendation 90-1, Recommendation 91-2, and Recommendation 91-3) and completed half the elements of another (the Savannah River ORR of Recommendation 90-4).

VIII. Departmental Representative to the Defense Nuclear Facilities Safety Board

The Secretary has established a new office headed by the Departmental Representative to the DNFSB who joined DOE in November 1991. This office will be the principal focal point for liaison between the DNFSB and various elements of DOE. By the end of January 1992 this office will be fully operational.

IX. Conclusions

The Department's goal for CY 1992, like the CY 1991 goal, is to complete implementation of as many of the Board's CY 1990 and CY 1991 recommendations as possible, to progress in all of the Board's recommendations, and to respond to new Board requests and recommendations in an expeditious fashion.