The Secretary of Energy
Washington, DC 20585

June 16, 2004

The Honorable Richard B. Cheney
President of the Senate
Washington, D.C. 20510

Dear Mr. President:

We are pleased to submit to Congress the enclosed report concerning plutonium storage at our Savannah River Site, located near Aiken, South Carolina. This report was mandated by Congress in Section 3183 of the Defense Authorization Act for Fiscal Year 2003 (Public Law 107-314). Section 3183 directed that the Defense Nuclear Facilities Safety Board (Board) conduct a study of the adequacy of facilities at the Savannah River Site for the storage of plutonium, and that it submit to Congress and the Secretary of Energy a report on that study. Congress further mandated in Section 3183 that not later than six months after the Board's report is submitted to Congress, and every year thereafter, the Secretary and the Board each submit to Congress a report on the actions taken by the Secretary in response to proposals in the report.

The Board submitted its report, *Plutonium Storage at the Department of Energy's Savannah River Site*, both to Congress and the Secretary of Energy by letters dated December 1, 2003. The enclosed report is the first one being submitted to Congress by the Department of Energy on the actions being taken in response to the eight proposals contained in the Board's December 2003 report. As indicated in our report, we are expediting our decisions on disposal of excess plutonium and re-evaluating our plutonium storage plan to determine if there are better options.

If you need additional information, please contact me or Mr. Rick A. Dearborn, Assistant Secretary for Congressional and Intergovernmental Affairs, at (202) 586-5450.

Sincerely,

Spencer Abraham

Enclosure

The Secretary of Energy
Washington, DC 20585

June 16, 2004

The Honorable J. Dennis Hastert
Speaker of the House of Representatives
Washington, D.C. 20515

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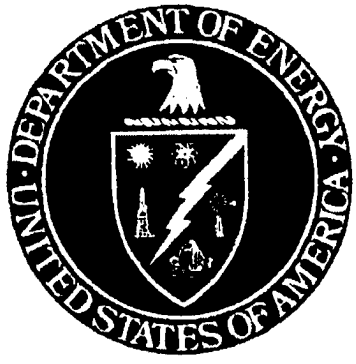
Spencer Abraham

Enclosure

First Report to Congress On Actions Taken by the Department of Energy In Response to the Proposals in the Defense Nuclear Facilities Safety Board's December 2003 Report to Congress on Plutonium Storage at the Savannah River Site



Department of Energy

June 2004

Report to Congress on Actions Taken by the Department of Energy in Response to the Proposals in the Defense Nuclear Facilities Safety Board's December 2003 Report to Congress on Plutonium Storage at the Savannah River Site

Introduction

Section 3183 of the Defense Authorization Act for Fiscal Year 2003 (Public Law 107-314) directed that the Defense Nuclear Facilities Safety Board (Board) conduct a study of the adequacy of the K-Area Materials Storage (KAMS) facility and related support facilities at the Savannah River Site (SRS), such as Building 235-F, for the storage of defense plutonium and defense plutonium materials. That statute also required that the Board submit to Congress and the Secretary of Energy a report on that study, including any proposals the Board considers appropriate to enhance the safety, reliability, and functionality of KAMS. Congress further mandated in Section 3183 that not later than six months after the Board's report is submitted to Congress, and every year thereafter, the Secretary and the Board each submit to Congress a report on the actions taken by the Secretary in response to the proposals, if any, included in the report.

The Board submitted its report, "Plutonium Storage at the Department of Energy's Savannah River Site," both to Congress and the Secretary by letters dated December 1, 2003. That report presented conclusions of the Board's study, and identified several proposals for enhancing the safety, reliability, and functionality of plutonium storage facilities at SRS.

This report is the first one submitted to Congress by the Secretary of Energy on the actions being taken by the Department of Energy (DOE) in response to the proposals contained in the Board's December 2003 report on plutonium storage at SRS.

Board's Proposals

The Board's December 2003 report contains eight proposals; two on the plutonium disposition program, five on the suitability of facilities (one on KAMS and four on Building 235-F), and one on remote monitoring and retrieval of material. Those proposals are listed below.

Plutonium Disposition Program

- Expedite the development of a complete, well-considered plan for the disposition of all excess plutonium to preclude unnecessary extended storage of plutonium at SRS.

- Conduct a new study of available options for the storage of plutonium at SRS.

Suitability of Facilities

KAMS

- Install fire protection systems and eliminate unnecessary combustibles in KAMS.

Building 235-F

- Establish an acceptable safety basis for stabilization and packaging of plutonium and extended storage of plutonium in the facility.

- Conduct a systematic evaluation of the safety systems to determine needed upgrades.

- Perform a structural analysis assessing seismic adequacy measured by current acceptance criteria. Since the facility has a new extended mission, the structural analysis should be based on ground motion equivalent to that used in the analysis for a new facility at SRS.

- Decontaminate unused process cells.

Remote Monitoring and Retrieval of Material

- Develop and implement validated procedures for the handling and intrasite shipment of plutonium containers, including damaged containers.

Discussion

This section provides some discussion/background in order to provide a better understanding of actions being taken by the Department.

Plutonium Disposition Program and Potential Consolidation of Surplus Plutonium at SRS

Over the past several years, DOE has made a series of decisions involving the storage and disposition of approximately 50 metric tons of surplus plutonium materials. Decisions have been made concerning the method of disposition to meet nonproliferation agreements with the Russian Federation (e.g., by fabrication of surplus plutonium into mixed oxide (MOX) fuel).

In April 2002 DOE decided, in concert with a decision to cancel the plutonium immobilization project, to select a plutonium storage alternative evaluated in the "Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement" (Storage and Disposition PEIS), DOE/EIS-0229, dated December

1996. As stated in the "Amended Record of Decision, Surplus Plutonium Disposition Program," published in the Federal Register, Vol. 67, p. 19432, April 19, 2002, DOE decided to immediately implement consolidation for long-term storage at the SRS of surplus non-pit material stored separately at the Rocky Flats Environmental Technology Site (RFETS). DOE stated specifically that the decision affected only the non-pit surplus plutonium located at Rocky Flats.

The decision to cancel the immobilization program was based primarily on an assessment that the agreement with Russia to further nonproliferation objectives by eliminating 34 metric tons of surplus plutonium from each nation could be met using only the mixed oxide fuel program. Subsequent to the 2002 decision, DOE determined that some surplus plutonium materials originally intended for immobilization could be processed and used to manufacture mixed oxide fuel. DOE issued the "Amended Record of Decision, Surplus Plutonium Disposition Program," published in the Federal Register, Vol. 68, p. 20134, April 24, 2003, indicating that about six metric tons of plutonium originally intended for immobilization could potentially be used as an alternative feedstock for the manufacture of mixed oxide fuel. Therefore, with 34 metric tons of surplus plutonium to be dispositioned through the MOX fuel program, approximately 16 metrics tons would be without a disposition path. However, about three metric tons of this surplus plutonium has subsequently been reclassified as programmatic need material, resulting in a total of up to approximately 13 metric tons of surplus plutonium that currently is without a disposition path.

All of the plutonium currently at SRS, which now includes all the surplus non-pit material once stored at the RFETS, is part of the 13 metric tons of surplus plutonium discussed above. The vast majority of the remainder of those 13 metric tons is currently stored at Hanford, with smaller amounts currently stored at the Los Alamos and Lawrence Livermore National Laboratories. Although the Department is evaluating the consolidation of the entire 13 metric tons at SRS, at the time of this report no decision had yet been made concerning this matter, and such a decision would be subject to appropriate National Environmental Policy Act (NEPA) review.

Suitability of Facilities

All the plutonium at SRS has been, and will continue to be, stored in a safe manner. The plutonium storage facilities at SRS, including KAMS and Building 235-F, meet all applicable safety requirements for their current limited storage missions, as documented in existing safety basis documentation.

Status of Actions Taken by DOE in Response to the Board's Proposals

Plutonium Disposition Program

Board Proposal: Expedite the development of a complete, well-considered plan for the disposition of all excess plutonium to preclude unnecessary extended storage of plutonium at SRS.

DOE Actions: DOE is conducting a preliminary investigation into a potential vitrification process that could be used at SRS to prepare excess plutonium that cannot be fabricated into MOX fuel for potential disposal in a deep geologic repository. This process would incorporate plutonium in small cans of lanthanide borosilicate glass. These small cans of plutonium-bearing glass would then be placed in Defense Waste Processing Facility canisters, surrounded with high-level waste glass. DOE is investigating the use of an existing SRS facility that could be adapted for installation of the vitrification capability. Any facility chosen would undergo a complete evaluation for its intended mission, and any required upgrades would be performed. The results of the feasibility study are to be provided to the Assistant Secretary for Environmental Management by the end of fiscal year 2004.

DOE is currently in the process of preparing a license application for a spent fuel repository at Yucca Mountain. Although DOE has done analytical work regarding disposal of plutonium immobilized in ceramic at Yucca Mountain, it has not done analysis specific to disposal of vitrified plutonium there. Accordingly, given the very preliminary nature of the investigation DOE is conducting into the feasibility of vitrifying plutonium in this fashion, the license application DOE is currently developing does not analyze or assume disposal of vitrified plutonium at Yucca Mountain. In conjunction with other aspects of its investigative work into the vitrification process, DOE will also seek to determine what kind of analytical work might be called for to support a potential license amendment that could allow it to dispose of the vitrified plutonium at Yucca Mountain, assuming DOE decides it is seriously interested in pursuing this course of action. Any serious planning by DOE concerning potential disposal of plutonium immobilized in this fashion at Yucca Mountain would, of course, require DOE to develop the necessary information to support such a license amendment and to seek and obtain the U.S. Nuclear Regulatory Commission's approval of such a license amendment.

Any plutonium vitrification capability would be established by implementing a project in accordance with DOE Order 413.3, "Program and Project Management for the Acquisition of Capital Assets." This Order describes the normal process that DOE uses for managing capital projects, and the appropriate NEPA review would be performed for this project.

Board Proposal: Conduct a new study of available options for the storage of plutonium at SRS.

DOE Actions: The Department is updating the November 2000 study concerning the storage of plutonium at SRS. Assumptions used to update the study will be consistent with the recently approved project concerning plutonium storage and stabilization in Building 235-F. The study update is expected to be completed by June 30, 2004.

Suitability of Facilities

KAMS

Board Proposal: Install fire protection systems and eliminate unnecessary combustibles in KAMS.

DOE Actions: DOE will evaluate the results of pending revisions to safety and fire hazards analyses to determine what actions are needed. In April 2003, DOE directed the contractor to revise the current safety basis documentation for KAMS to reflect a facility life that extends beyond ten years. As part of this facility life extension evaluation, a new Fire Hazards Analysis (FHA) for KAMS is also being performed. The revised analyses are expected to be completed by September 2004.

The original design life for the KAMS facility was about 10 years. The fire protection posture designed into KAMS was to minimize both transient and fixed combustibles within the facility such that the remaining worst possible fire could not cause a release of plutonium. The walls separating the KAMS facility from the remainder of the K-Reactor building were fabricated into a two hour fire boundary. Combustibles outside the facility fire boundaries were minimized, contained, or mitigated to ensure the KAMS facility fire boundaries were rated longer than any credible fire would burn.

Building 235-F

Board Proposal: Establish an acceptable safety basis for stabilization and packaging of plutonium and extended storage of plutonium in the facility.

DOE Actions: A revised safety basis and FHA are currently scheduled to be completed and submitted to DOE by no later than April 2005. In conjunction with the decision last year to pursue a project to install a DOE-STD-3013 container surveillance, packaging and storage capability in Building 235-F, DOE directed the contractor in April 2003 to upgrade the 235-F safety basis for the remainder of the facility to be commensurate with such an extended facility mission. The safety basis revisions will result in one set of 10 CFR 830 (*Nuclear Safety Management*)-compliant Documented Safety Analysis (DSA) and associated Technical Safety Requirements (TSRs) for the 235-F facility.

Board Proposal: Conduct a systematic evaluation of the safety systems to determine needed upgrades.

DOE Actions: A systematic evaluation of safety systems to determine needed upgrades will be performed as part of the ongoing revision to the safety basis. As part of the normal process of development of a 10 CFR 830-compliant safety basis, a systematic evaluation of the required safety systems is conducted to ensure those systems can perform their required functions. For existing facilities, the safety systems must be evaluated to ensure they can perform the required safety function identified by the accident analysis performed as part of the revision to the safety basis. The process at SRS used to perform this evaluation is called a backfit analysis, an engineering evaluation process controlled by WSRC Manual E7, "Conduct of Engineering and Technical Support Procedure Manual," Procedure 3.41, "Backfit Analysis Process." All active safety systems identified by the new 235-F DSA will have a backfit analysis performed to ensure they can perform their required safety function. If any upgrades to safety systems are needed, they will be identified based on the analysis. DOE will review the backfit analysis as part of its DSA approval process.

Board Proposal: Perform a structural analysis assessing seismic adequacy measured by current acceptance criteria. Since the facility has a new extended mission, the structural analysis should be based on ground motion equivalent to that used in the analysis for a new facility at SRS.

DOE Actions: A structural analysis of Building 235-F and its outlying buildings is being conducted to current acceptance criteria, as part of the DSA upgrade discussed above. New soil settlement evaluations are also being conducted to identify the maximum expected differential settlement from a design basis seismic event. Building 235-F and outlying structures will then be analyzed to determine the overall effect of the seismic event on safety systems. Any modifications to safety systems to ensure they can perform their required functions during and after a seismic event would be made prior to extending the current facility mission. Since 235-F is an existing facility, the structural analysis is being conducted based on ground motion equivalent to that used for an existing facility at SRS. However, a structural analysis for Building 235-F and its outlying structures based on a ground motion equivalent to that used in the analysis for a new facility at SRS is also being performed. DOE will evaluate the results from these facility structural analyses to determine what course of action will be required to provide adequate protection to the public and workers from postulated accidents.

Board Proposal: Decontaminate unused process cells.

DOE Actions: A feasibility study is being performed to determine whether the cells can be decontaminated or whether the plutonium-238 within the cells can be immobilized such that it would not be released during any design basis accidents in the facility. An assay of these process cells is also currently in progress to provide a better determination of the actual amount of plutonium remaining. Based on the results of the feasibility study, expected to be completed by October 2004, DOE will determine what course of action will be appropriate. It should be noted that the safety basis upgrade and systematic evaluation of the resulting safety systems must be consistent with the path forward from this feasibility study.

Remote Monitoring and Retrieval of Material

Board Proposal: Develop and implement validated procedures for the handling and intrasite shipment of plutonium containers, including damaged containers.

DOE Actions: WSRC- RP-99-01027, "Memorandum of Agreement Between the Nuclear Materials Management Operations Business Unit and the FB-Line Project Closure Business Unit," Revision 2, with an effective date of April 13, 2004, describes the responsibilities and requirements for shipment of containers with plutonium from KAMS to F-Area. The handling and intrasite shipment of plutonium-bearing containers at SRS is an ongoing process that utilizes DOE Orders and site procedures. The ability to ship simulated damaged containers from KAMS to F-Area was demonstrated during the Operational Readiness Review for KAMS. Prior to any shipment, a detailed engineering review would be performed based on the specific damage to the shipping container. A generic procedure for F-Area to receive a damaged container has recently been approved.