DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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October 21, 1994

Mr. Mark Whitaker, EH-6
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Dear Mr. Whitaker:

Enclosed for your information and distribution are 24 Defense Nuclear Facilities Safety Board (DNFSB) staff reports. The reports have been placed in the DNFSB Public Reading Room.

Sincerely,

George W. Cunningham
Technical Director

Enclosures (24)

94-0005846

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 9, 1994

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: Monique Helfrich

SUBJECT: Sandia National Laboratory-New Mexico - Low Level Waste Management and Environmental Protection

1. **Purpose:** This trip report describes the May 10-12, 1994 initial review by the Defense Nuclear Facilities Safety Board (DNFSB) staff of the Sandia National Laboratory-New Mexico (SNL-NM) radioactive waste management and environmental protection programs. This review was intended to familiarize the staff with these areas, tour waste management facilities and review specific low-level waste management issues that have been observed at other Department of Energy (DOE) facilities. The staff review team consisted of Monique Helfrich and Donald Owen.

2. **Summary:** Based on the meetings with SNL waste management and environmental protection personnel and on facility tours, the major observations noted by the staff were:

   a. There is a lack of an integrated approach to the management of low-level waste. DOE oversight is inadequate, but staffing increases are planned to provide increased oversight in this area.

   b. There is a lack of standards and criteria for the storage of low-level waste; this is a complex-wide problem.

   c. SNL has taken positive steps in managing its mixed wastes, particularly with respect to waste minimization.

3. **Background:** SNL generates low-level waste (LLW), transuranic waste, hazardous waste and mixed waste. SNL is required to send the LLW to the Nevada Test Site (NTS) for disposal. Air emissions from SNL buildings are subject to the requirements of 40 CFR 61, Subpart H, *National Emissions Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities.* Liquid discharges are sent to the city sewage treatment system.

4. **Discussion:** The review consisted of meetings with personnel from both the DOE-Kirtland Area Office (DOE-KAO) and SNL-NM, and tours of waste management storage areas (bunkers in the Manzano Area, buildings in TA-V, the Radioactive Mixed Waste Packaging Facility, and the Interim Storage Site) and environmental monitoring stations.

   a. Waste Management

      1. Low-Level Waste Inventory - SNL is currently storing LLW wastes at various facilities, prior to characterization, certification, and disposal at the Nevada Test Site (NTS). Current major categories of LLW at SNL-NM are described below:

         (a) About 12,000 kg of thorium oxide are stored in an interim mixed waste storage area in a bunker. The thorium dioxide was received by SNL in 1982 from Bettis Atomic Laboratory for use in the Core Retention Concept Assessment Program. Experiments were performed with small quantities of material. The remaining material was turned over to the SNL Waste Management organization in 1993. Eventual disposal at NTS is planned but not yet scheduled.

         (b) Low-level resins, generated by the polishing system for the Annular Core Research Reactor (ACRR), are stored in an interim mixed waste storage area in the Building 6596 high bay area in TA-V. The low-level resins, which have an average loading of about 0.5 to 1 nCi per package, are stored in their original containers, which are not vented. Storage of these resins began in 1989, and small amounts of additional resin are accumulated as the reactor continues to operate. Plans for disposal have not been developed.

         (c) Since 1989, about 12,000 cubic feet of LLW and mixed waste have been stored in land-sea containers at the Interim Storage Site (ISS), an outside storage pad. Beneath the ISS, wastes were buried until 1988. Plans for disposal are under development. After shipment of ISS wastes, the ground under the ISS will be the subject of an environmental restoration project.

      2. LLW Management - SNL has not developed an integrated program for management of its LLW. No waste generators at SNL are currently certified to send LLW to the NTS or any other LLW disposal facility. SNL is working to get a low-level lab trash waste stream certified for disposal; they hope to have this waste stream certified by the end of this summer 1994, and will then work on certifying the other waste streams. However, no approved schedule exists for generator certification of these low-level waste streams, which is required prior to disposal at the NTS or other LLW disposal facilities. This situation continues to

exist because there is no time limit in the current DOE standard on long-term storage of LLW prior to disposal.

This situation is similar to other DOE complex sites where wastes are stored on site at facilities awaiting certification and transportation to a LLW disposal site. Established standards or criteria to govern the storage (short-term or long-term) of these wastes do not exist.

3. Order Compliance - Seven Compliance Schedule Agreements were written in 1992 for noncompliances with DOE Order 5820.2A, *Radioactive Waste Management*. The CSAs for LLW dealt with noncompliances with requirements for record keeping and characterization, waste minimization and reduction, waste storage, disposal sites, and certification and quality assurance. These CSAs, particularly the CSA (SNL-DOE-5820.2A-CSA-0010-A) addressing the requirement that waste be certified by the generator, do not appear to reflect accurately SNL's current efforts related to LLW management. Activities to upgrade order compliance assessments and the overall order compliance program at SNL are in progress.

4. Generation of Mixed Wastes - In May 1992, DOE-Albuquerque instructed its sites to temporarily stop generating mixed wastes (i.e., waste that was subject to Land Disposal Restriction requirements). In response to this instruction, SNL has implemented senior management reviews and required approvals to control the generation of mixed waste. The mixed waste generation rate, which averaged about 200 ft^3/month in 1989-1990 (with a high of ~575 ft^3/month in April 1989), has dropped to less than 25 ft^3/month in 1994.

5. Status of the Radioactive and Mixed Waste Management Facility - The RMWMF, which is scheduled to begin operations in 1995, will repackage LLW and TRU waste. Part of its repackaging process will involve compaction of the waste for shipment to off-site disposal sites. DOE-KAO indicated that readiness reviews will be conducted on this facility in accordance with applicable DOE requirements.

b. DOE Oversight: Periodic audits of radioactive and mixed waste management are performed by DOE Headquarters and DOE Albuquerque Operations Office. Continuing oversight of both waste management and environmental protection is the responsibility of DOE-KAO. DOE-KAO personnel indicated that current staffing at DOE-KAO does not allow for adequate ongoing oversight and surveillance of waste management and environmental protection activities at SNL. DOE-KAO stated that increases in staffing at KAO have been approved to provide increased oversight in this area.

c. Environmental Protection Program

1. Air Emissions - SNL is currently in compliance with the monitoring and modeling protocols of 40 CFR 61, Subpart H, and their yearly effective dose equivalent (EDE) has averaged 10^{-3} mrem since 1989.

2. Liquid effluents - SNL is in the process of starting up the Liquid Effluent Control System (LECS), which was built to ensure that effluents from TA-V, which are sent to the city sewage system, are not radioactive. This system consists of a series of holding tanks for monitoring prior to discharge and a series of mixed ion exchange units designed to reduce radioactivity levels to below the Derived Concentration Guides of DOE Order 5400.5, *Radiation Protection of the Public and the Environment.*

d. Information Management System: As part of its pollution prevention program, SNL is in the process of integrating its various environmental information systems for both waste management and environmental protection programs. The purpose of this integration effort is to eliminate redundant systems and make environmental information readily available to the various groups. The critical element in the development of these systems will be the integration of the radioactive materials tracking system. Currently, this integration effort does not have formal upper management support.

5. **Future Staff Actions:** The low-level waste management issues identified during this review are common to DOE facilities across the complex, and, therefore, will be followed as complex-wide issues, rather than site-specific issues. The staff will follow the DOE preparations for startup of the Radioactive and Mixed Waste Packaging Facility.