DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 6, 1995

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: Monique Helfrich

SUBJECT: Radioactive Waste Management Review at the Rocky Flats Environmental Technology Site

1. **Purpose:** This trip report describes the January 9-12, 1995 review of the radioactive waste management program at the Rocky Flats Environmental Technology Site (RFETS) by Monique Helfrich and Mark Sautman of the Defense Nuclear Facilities Safety Board (DNFSB) staff. This visit included discussions with both the Department of Energy (DOE) Rocky Flats Field Office (RFFO) and EG&G-Rocky Flats, Inc. (EG&G) personnel and tours of radioactive waste storage areas.

2. **Summary:** The RFETS is having a difficult time shipping radioactive waste off site because many of its waste containers cannot meet certification requirements for shipment to the Nevada Test Site (NTS). Because its waste generation rate exceeds its disposal rate, on-site storage capacity remains a serious issue. The increase in waste volumes resulting from decommissioning and environmental restoration activities, combined with a weak waste minimization program, will only worsen the situation in the next few years.

   However, it should be noted that characterization and venting of drums of transuranic waste exceeds similar work performed for residues. In addition, since the DNFSB staff began reviewing waste management activities at the RFETS (starting with the resumption of Building 559), RFETS waste management personnel have considerably improved their knowledge and management of the waste that is being stored on site (including characterization of drum contents, location of drums, and condition of drums).

3. **Background:** Low-level waste (LLW) and low-level mixed waste (LLMW) at the RFETS are stored in buildings and under tents on the 750 and 904 pads. Currently, 80% of the on-site LLW storage capacity of 8000 yd^3 is in use, while 98% of the 14,800 yd^3 of Resource Conservation and Recovery Act (RCRA) permitted LLMW storage capacity is in use.

   RFETS's transuranic (TRU) waste is very similar in composition to their plutonium residues, except that the plutonium contents are below the economic discard limit. All TRU and transuranic-mixed (TRU-M) wastes at the RFETS are stored in buildings. Currently, the on-site

TRU waste storage capacity of 305.5 yd^3 is completely filled, with the excess waste being stored in RCRA regulated areas. In addition, the inventory of TRU-M stored onsite has reached 60% of the 1601 yd^3 limit.

4. Discussion:

a. General Observations:

1. All waste drums (radioactive, hazardous, and mixed) currently being generated at the RFETS are vented. The backlog of unvented waste drums (approximately 1100 drums) is scheduled to be vented over the next two years. In the past, RFETS has experienced excessive corrosion of vents in drums containing Ful-Flo filters. Stainless steel vents are now being used for drums containing Ful-Flo filters to reduce filter corrosion. The staff had a minor concern regarding the placement of Tamper Indicator Devices (TIDs) over the drum vent that could impair inspections for corrosion.

2. Storage limitations at the RFETS are leading to the storing of radioactive wastes in RCRA regulated areas and the shuffling of drums back and forth across the site. Specific problems associated with the storage and disposal of LLW and TRU wastes are discussed in the following sections.

b. Low-Level Waste Management:

1. During FY94, RFETS only made ten LLW shipments to NTS (a shipment can contain up to 57 yd^3 of waste). This is contrasted to Fernald's 600 shipments. In FY95, RFETS anticipate shipping 395 yd^3 to NTS and 168 yd^3 to Hanford. However, this is only about half of their current generation rate of 1065 yd^3 per year.

   The inability of RFETS to increase the number of LLW shipments for off-site disposal is a result of problems with waste certification, logistics and money. Of the drums sent by the generators to Building 664 for staging and shipment to NTS, 90% are not acceptable for reasons ranging from paperwork errors to improper packaging. This initial rejection rate has been reduced to 30% with fairly simple corrections; however, those drums that cannot be corrected have to be sent back to the generator for repackaging. In addition, it is difficult to stage large shipments of LLW drums in Building 664 because of the large number of waste drums being stored in the building.

   EG&G waste management personnel have been told by the operators of the NTS disposal facility that their waste certification program may be too complicated. In addition, waste management personnel visited Fernald in January 1995 to get advice on how to improve their program.

2. During discussions with EG&G waste management personnel on the potential impact of the lawsuit filed by the state of Nevada, it was stated that a shutdown of the NTS disposal facility would leave RFETS with eleven months of LLW storage capacity.

c. Transuranic Waste Management:

1. In contrast to the management of the residue drums, venting of TRU and TRU-M waste drums has been ongoing for the last several years. Currently, waste management personnel are using residue risk potential ranking to set priorities for venting the remaining unvented drums. In addition, headspace gas samples have been taken from nearly 350 waste drums. Elevated hydrogen levels were found in drums of solidified sludge and organics. Venting of these drums has been made a high priority.

2. As with LLW, there is a lack of storage space in both operating and long-term storage facilities. In particular, there is a lack of vacant floor space as well as a potential conflict of activities in Building 776. This is the building in which venting and gas sampling of TRU and TRU-M waste drums takes place; 1150 drums are left to be vented. A conflict could occur as a result of competition for equipment and trained staff to vent the waste drums as well as the residue drums, as committed to in the Implementation Plan for Recommendation 94-1.

3. It was noted during the presentations by EG&G waste management personnel as well as during the tour of Building 776, that the Supercompactor is currently in standby due to lack of feedstock material (i.e., drums of TRU waste).

d. Mixed Waste Management: RFETS generates approximately 20 yd^3 per month of LLMW and is working on obtaining approval to ship LLMW to Envirocare of Utah for disposal. Starting in the late spring, RFETS plans to ship 315 yd^3 of saltcrete and 93 yd^3 of filter sludge during FY95.

e. Waste Minimization:

1. The waste minimization program has recently been refocused from the implementation of large-scale waste minimization research and development projects to performing Pollution Prevention Opportunity Assessments in order to identify and initiate opportunities for waste minimization activities. The results of these assessments are recommendations to the facility managers, not directives.

2. The goal of the waste minimization program is to reduce the projected waste generation forecast by 50% by 2005, with the current performance indicators focused on the reduction of waste generation and on-site inventory. From 1990 to 1992, generation of

all waste types at the RFETS decreased; however, with the exception of TRU-M and TRU wastes, it began to increase in 1993.

As decommissioning and environmental restoration activities at RFETS increase, the amount of waste generated will also increase, and goals and performance indicators which were appropriate for a site that was involved in routine production activities or was in standby mode, will no longer be relevant. Discussions with EG&G personnel on this subject indicated that while they were aware of the need to develop better goals and performance indicators, they have not actually begun to do so.

3. It should be noted that current cost of disposal at the Nevada Test Site of low-level waste generated by the RFETS is \$10 per ft^3 (as compared with an estimated commercial low-level waste disposal cost of \$300 per ft^3). This is not much of an incentive to minimize the waste generation rate.

f. Audits and Assessments:

1. Although required by DOE Order 5820.2A, *Radioactive Waste Management*, to perform independent health, safety, and quality assurance audits of field waste management operations in order to evaluate compliance with the requirement of the Order (Functions and Requirements Manual, All Cognizant Secretarial Officers, Order 5820.2A, [180]), DOE-Headquarters has not performed an audit since 1991. At the end of the DNFSB staff visit, however, an audit was being scheduled.

2. DOE Order 5820.2A also requires that managers of field offices appraise any waste-generating organization that ships waste to their site for treatment, storage or disposal to ensure compliance with established waste acceptance criteria (FAR Manual, Managers, Field Offices, Order 5820.2A, [779]). The last NTS annual audit of the LLW program was conducted in August 1993, which resulted in the January 1994 approval to ship ten waste streams to NTS for disposal; the next audit is scheduled for May 1995. The Hanford audit of the LLW program was conducted in November 1994. The last WIPP audit of the TRU-M program was conducted in February 1993; the next one may be conducted in 1996.

5. **Future Staff Actions:** The staff will follow future TRU drum venting and characterization, and mixed waste treatment activities that are related to residue stabilization projects.