DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 25, 1994

MEMORANDUM FOR: G. W. Cunningham, Technical Director

FROM: Steven Stokes, Senior Systems Engineer

SUBJECT: Report on Solid Waste Operations at the Hanford Site, June 17, 1993 and November 3, 1993

1. **Purpose:** This report documents DNFSB technical staff trips to the Hanford Site to review the solid waste program. An overview approach was taken to familiarize the staff with the Tank Farms Solid Waste operations and with operations at the Central Waste Complex (CWC), a storage and staging area managed by Westinghouse Hanford Company (WHC), and Solid Waste Operations (SWO). The focus of the review was to: (1) understand how waste is managed from the point of generation to disposal, (2) understand organizational and management responsibilities for solid waste issues, (3) understand the standards used to manage the solid waste program, and (4) evaluate the potential for safety issues.

2. **Summary:** The solid waste program at the Hanford Site is operated by two types of organizations: (1) solid waste management at the point of generation, i.e., Tank Farms solid waste management, Plutonium Finishing Plant solid waste management, etc., and (2) Solid Waste Operations, a WHC organization that receives, handles, stores, and disposes of solid waste at the Hanford Site. Overall responsibility for solid waste issues has been given to a single Department of Energy (DOE) Richland Operations Office (DOE-RL) organization. Operational responsibility is, however, divided along program lines; this has led to uneven emphasis being placed on solid waste management issues from program to program. Several issues, most notably the backlog waste issue (Occurrence Report Number RL--WHC-SOLIDWASTE-1993-0013) have resulted from this organizational division of responsibility and poor upper management attention. The level of DOE-RL management attention is changing, primarily due to Washington Department of Ecology oversight and the increased emphasis placed upon DOE environmental programs overall. Additionally, radioactive wastes have been placed in burial grounds at the Hanford Site for nearly 50 years. There is very little information regarding the exact nature of wastes placed in the ground in the early years. Any attempt to recover these wastes will be inherently dangerous, both from a worker dose and public health and safety perspective.

3. **Background:** Management of solid wastes, including transuranic wastes (TRU), low level wastes, and mixed wastes (both mixed TRU and low level wastes), is conducted at the Hanford Site. The Hanford Site is also one of the few remaining DOE sites that will accept

wastes generated at other locations (i.e., Battelle Columbus, ~~Naval Reactors submarine hulls~~ naval reactor plants, etc.). Solid waste at the Hanford Site has recently been the subject of considerable controversy due to the violation of Resource Conservation and Recovery Act (RCRA) requirements at the Tank Farms (backlog waste issue). Though this issue, the expeditious characterization and shipment of mixed radioactive and hazardous waste, is based upon RCRA requirements to characterize and ship wastes within 90 days of generation and is not a safety issue *per se*, the potential for safety issues does exist if solid wastes are not managed properly.

4. Discussion/Observations:

a. DOE-RL Solid Waste Management: Centrally, DOE-RL management of solid waste is performed by the Solid Waste and Transportation Branch, Waste Management Division. This organization is responsible for key elements of the overall solid waste management program, including establishing and implementing waste management policy at the Hanford Site, oversight of the CWC and burial grounds, construction of facilities for the treatment of solid waste (i.e., Waste Receiving and Processing Facilities--modules 1 and 2), and oversight of the generators of solid waste.

DOE-RL oversight of each solid waste generator (e.g., Tank Farms) is delegated to the associated DOE program managers (for this example, the Tank Waste Remediation System Program Manager).

The fracturing of responsibility along programmatic lines has led to uneven emphasis and expertise being placed on solid waste management issues from program to program. This has resulted in a variety of programmatic and management issues, most notably the backlog waste issue. It was also evident from discussions with Waste Management Division personnel that historically, little emphasis has been placed upon solid waste issues by the individual program managers. This is evident, for example, in the activities associated with disposal of TRU wastes in near-surface disposal trenches. However, the level of DOE-RL Management attention is changing, apparently due to Washington Department of Ecology oversight and the increased emphasis placed upon DOE environmental programs overall.

b. WHC Solid Waste Management: SWO's primary function is to manage of on-site disposal and storage facilities (permanent disposal and long-term storage in excess of 90-days). Additionally, SWO acts as a site-wide policy setting and internal oversight group that issues and enforces implementing standards used by the solid waste generators.

(1). Solid Waste Operations:

Walkthroughs of the Central Waste Complex, burial grounds, and Transuranic Waste Storage and Assay Facility (TRUSAF) were conducted. Operations were generally well organized and effectively manned with emphasis being placed upon RCRA storage and handling requirements. However, operators were generally not familiar with applicable safety requirements. It was apparent that training is strongly focused on regulatory requirements. This does provide a measure of safety compliance to the extent that RCRA embodies certain safety tenets, but RCRA alone cannot account for the fact that these are nuclear facilities (albeit very low hazard in most cases). Reconciliation of RCRA requirements with ALARA concerns related to radiation dose (e.g., frequent inspection of waste containers) has occurred.

Review of storage records, by DNSFB Technical Staff, for randomly picked waste packages at storage facilities resulted in 100% reconciliation between field conditions and records. These records also include data on waste packages dating back to initial site operations. Although these records are not as complete as present day records, they do provide insight into the variety of wastes buries at the Hanford Site. Waste packages weighing on the order of thousands of tons have been in the burial grounds since the 1940's. Very little knowledge of their exact nature, and any attempted recovery of these waste packages will be inherently dangerous, both from a worker dose and public health and safety perspective.

2. Tank Farms Solid Waste:

(a) Solid waste operations at the Tank Farms were reviewed to determine if wastes generated at the Tank Farms were certified for shipment to SWO. The Hanford Waste Acceptance Criteria (WAC) require that all waste streams be certified by SWO prior to receipt at SWO facilities. Receipt by SWO is necessary for proper disposal of all wastes at the Hanford Site.

Until recently, Tank Farms had not been able to ship mixed radioactive wastes to SWO due to revocation of their status as a certified generator. The inability to ship waste resulted in a backlog of waste retained in the tank farms in violation of RCRA requirements. This was the subject of the backlog waste program. Tank Farms has since corrected waste operations deficiencies and is a certified waste generator. They currently have five waste streams certified for shipment to the CWC. These are: (1) Low Level Radioactive Waste, (2) Low Level Waste - Debris (radioactive mixed waste), (3) contaminated soil, (4) other chemical products (primarily hazardous wastes), and (5) maintenance wastes (hazardous wastes only).

Given the past performance of Tank Farms, significant internal oversight efforts by SWO have been performed to ensure that Tank Farms properly characterizes wastes prior to shipment. Weekly audits by SWO have been used to both educate

Tank Farms solid waste personnel and closely follow their progress at implementing the waste acceptance criteria.

Current efforts by Tank Farms solid waste management to trend data associated with failure to properly implement the WAC have not yet proven useful since data collection has only been conducted for one quarter. Tank Farms Solid waste management did recognize the value of collecting this data, but they did not have a firm understanding of how they intended to incorporate results of data analysis into training or other efforts designed to correct deficiencies.

Current efforts are underway to train and certify Tank Farms solid waste operations personnel. The training matrix for these individuals was briefly reviewed. The training courses do appear to represent an appropriate level of training given the job requirements. However, problems have already been noted in application of training (i.e., operators are not consistently able to complete solid waste paperwork properly). Therefore, the present level of training may not be adequate to meet quality requirements.

(b) Tank Farm Solid Waste Staging:

Tank Farms solid waste staging areas, selected at random, were visited to view the general cleanliness and appropriateness of waste storage. Each site was well maintained, free of debris, clearly and appropriately marked, and free of obvious safety hazards (e.g., open drums, leaking drums, etc.). Waste drum inventory information was spot checked to see if actual inventories in the field matched records. In all cases, official records matched field conditions. The condition of waste staging areas observed is not considered to be representative of actual operating conditions since a Tank Farms administrative hold has essentially eliminated all solid waste generation at this time.

c. Solid Waste Standards at the Hanford Site: DOE-RL and WHC rely upon guidance provided in DOE Order 5820.2A, *Radioactive Waste Management* as the overall standard for solid waste management activities. Since this DOE Order provides little, if any, specific guidance, the primary standards used at the site are:

- Hanford Waste Acceptance Criteria,
- WHC controlled manuals, and
- Line organization operating procedures.

Additionally, these documents incorporate RCRA requirements as they apply to solid waste management at the Hanford Site.

A DNFSB technical staff review of these standards revealed that they do encompass the body of knowledge required to effectively manage solid waste activities. However, since they represent a tiered hierarchy of documents (i.e., the Hanford WAC provides very general requirements applicable to all waste generators, including offsite generators, while operating procedures provide specific instructions) consistency of quality and application is an issue. There does not appear to be any effort to review standards down to the program level. Rather, control and oversight are focused on waste shipment to SWO. This results in detection of problems only after they have developed. Note that due to the backlog waste issue, this condition appears to be improving at Tank Farms.

5. **Future Staff Actions:** Recommended staff actions are based upon the level of risk associated with present solid waste operations and are restricted to observation of upcoming TRU waste retrieval activities (summer 1994).