

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 3, 1993

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: Daniel G. Ogg and Michael J. Merritt

SUBJECT: West Valley Demonstration Project (WVDP) - Trip report
(October 6-8, 1993)

- 1. Purpose:** This report documents the results of a trip conducted by members of the DNFSB staff to the West Valley Demonstration Project (WVDP) to review the radiation protection program and the development of safety analyses for the activities being conducted by West Valley Nuclear Services (WVNS) at the site.
- 2. Summary:** A review of the West Valley radiological controls program revealed a concerted effort by WVNS to come into compliance with the DOE *Radiological Control Manual*, DOE/EH-0256T (Radcon Manual) and DOE Order 5480.11, *Radiation Protection For Occupational Workers*. Procedural (administrative) compliance was exhibited (for the requirements sampled) by WVNS for the requirements of the Radcon Manual. Based on limited DNFSB observations, however, the staff believes that field implementation (adherence) has not yet been achieved. Specifically, the use of temporary shielding was evaluated and found not to be in accordance with the requirements of Article 314 of the Radcon Manual. In addition, field practices related to removal of anti-contamination clothing and exiting contamination areas were not consistent among radiation workers observed and in some cases were not performed in accordance with the requirements of Appendix 3C of the Radcon Manual.

A Safety Analysis Report (SAR) and Technical Safety Requirements (TSRs) are being developed by WVNS for the vitrification facility and first drafts are to be available in April 1994. Development of the SAR includes the use of radiological dose criteria for both the public and co-located workers. The source of these criteria is the proposed DOE Standard, DOE-DP-STD-3005-93, *Definitions And Criteria For Accident Analysis*.

- 3. Background:** The WVDP is operated by WVNS for the Department of Energy to process high level nuclear waste (HLW) that was created by the reprocessing of commercial and defense spent fuel from 1966 to 1972. The waste is located in two tanks; one containing PUREX waste, and the second containing THOREX waste. The PUREX waste has been pretreated to remove cesium and transuranic radionuclides, and the decontaminated supernatant liquid is being solidified into a Class A low level waste (LLW) in the form of cement. WVNS plans to vitrify and dispose of the HLW, and treat and dispose of all LLW

generated in what is called Phase I of the project. Phase II involves decontamination and decommissioning the site and site closure. Current plans indicate that hot vitrification will begin in early 1996.

4. Discussion:

a. **Radiation protection program:** WVNS has a well developed radiation protection program, as demonstrated by its procedural compliance with the DOE Radcon Manual. Management leadership in the radiological controls organization appeared strong. Also, WVNS has shown significant initiative by implementing the radiological area posting requirements specified in Chapter 2 Part 3 of the Radcon Manual, including the use of radiological buffer areas. Other positive aspects of the program included:

1. Qualifications of the radiation protection and health physics staff
2. Radcon training program
3. Control of radiological work
4. Occurrence reporting and issue tracking
5. Bioassay program

Upon review of the program to verify compliance in the field with the Radcon Manual, the DNFSB staff noted the following deficiencies:

1. The types of meters available at frisking stations were not consistent, and clear instructions for the use of alpha contamination frisking instruments were not available (Radcon Manual Article 338.8)
2. Positive control of respirators is not maintained per Article 531 of the Radcon Manual
3. Inconsistencies and lack of proficiency were noted in persons removing anti-contamination clothing (Radcon Manual Chapter 3)
4. The use of temporary shielding was not in compliance with Radcon Manual Article 314¹. Specific observations included:
 - a) Items not used as shielding were marked as shielding.
 - b) Items used as shielding were not marked as shielding.
 - c) Shielding listed in the temporary shielding log was not installed.
 - d) Shielding not listed in the temporary shielding log was installed.
 - e) Some installed shielding consisted of bare lead - a toxicity hazard.
 - f) Some temporary shielding was not secured - an industrial hazard.

¹ Although all items listed are not specifically in violation of the Radcon Manual requirements, the existence of the condition and compliance are mutually exclusive.

- g) One facility manager was not aware of the existence of a site temporary shielding instruction, even though temporary shielding was utilized routinely in their facility.

- b. **Safety Analyses and TSRs:** WVNS is developing a Safety Analysis Report (SAR) and Technical Safety Requirements for the vitrification facility, the scope of which includes waste transfer to the vitrification plant, vitrification, and interim waste storage. The SAR was started in early CY 1993 and the first draft is expected to be delivered to the DOE West Valley Project Office in April 1994.

Of note in the SAR is the use of the proposed DOE Standard, DOE-DP-STD-3005-93, in selecting public radiological criteria and co-located worker radiological criteria.