UNITED STATES
NUCLEAR REGULATORY COMMISSION
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August 31, 1999

MEMORANDUM TO: C. William Reamer, Chief
HLWB/DWM/NMSS

THRU: N. King Stablein, Section Leader
Engineering and Material Section
HLWB/DWM/NMSS

FROM: John Contardi, Chemical Engineer, HLWB/DWM/NMSS
B. Jennifer Davis, Materials Engineer, HLWB/DWM/NMSS
Jack Parrott, Project Scientist, DCB/DWM/NMSS

SUBJECT: TRIP REPORT - U.S. DEPARTMENT OF ENERGY WORKSHOP ON DISPOSITION PATH(S) FOR HIGH-LEVEL WASTE CONTAMINATED COMPONENTS, WEST VALLEY, NEW YORK, AUGUST 2-4, 1999

On August 2-4, 1999, B.J. Davis, J. Parrott, and J. Contardi attended a U.S. Department of Energy (DOE) workshop on the disposition path(s) for high-level waste (HLW) contaminated components from vitrification. The goals of the workshop were to address the concerns of EM-32 in their June 7, 1999, memo, WEST VALLEY DEMONSTRATION PROJECT WHITE PAPER CONCERNING ENCAPSULATING GLASS CONTAMINATED INCONEL MELTER HARDWARE IN A HIGH-LEVEL WASTE VITRIFIED CANISTER as well as the review of the "evaluation" process for the "waste incidental to reprocessing" provided in DOE M 435.1 Section II.B(2) (attached).

DOE sites represented at the workshop included the following: Savannah River Site (SRS), Hanford (DOE-RL), DOE-Headquarters (DOE-HQ), Idaho National Engineering and Environmental Laboratory (INEEL), West Valley Demonstration Project (WVDP), and the Office of Civilian Radioactive Waste Management (OCRWM). A complete attendee list is attached.

The workshop began with SRS and WVDP presenting their individual site inventories for HLW glass contaminated waste streams. Afterwards, SRS discussed the resolution of an unexpected occurrence with a pour spout at the Defense Waste Processing Facility (DWPF). At the DWPF during normal operations, a pour spout fell into a HLW canister and was subsequently covered in HLW glass. SRS determined that metal equipment of known pedigree (as in this case) should have no adverse affects on the integrity of the HLW canister. Therefore, HLW glass contaminated metal components could theoretically be disposed of in HLW glass canisters at Yucca Mountain (YM). During this discussion, other possible options for disposal were also formulated.

The ability to consider disposal options other than HLW disposal at YM stems from DOE Order 435.1 and the associated manual, M 435.1, Section II.B(2) for incidental waste classification. The manual allows waste to be declared as incidental by two processes. The first process is

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through citation. A waste form that meets the description included in the Notice of Proposed Rulemaking (34 FR 8712) for proposed Appendix D, 10 CFR Part 50, Paragraphs 6 and 7, can be classified as incidental by citation. The second manner in which a waste may be declared as incidental is through an evaluation process. The evaluation process allows waste to be managed as either low-level waste (LLW) or transuranic waste (TRU). In order for a waste to be managed as a LLW it must meet three criteria similar to the three criteria established by the NRC in the March 2, 1993, letter from M. Bernero (NRC) to J. Lytle (DOE). The only difference between DOE M 435.1 and the Bernero to Lytle letter is in regards to meeting Class C LLW concentration limits stated in 10 CFR 61.55. Rather than requiring that waste cannot exceed the applicable concentration limits for Class C low-level waste, DOE has included "...or will meet alternative requirements for waste classification and characterization as DOE may authorize.". Similar criteria are provided for TRU waste classification, which must also meet the provisions of Chapter III of DOE M 435.1.

The sites then listed all of the possible waste streams from the vitrification process. Examples of these waste streams are as follows: glass contaminated metals, glass contaminated non-metals, melters, off-gas collection equipment and media, glass samples, and general debris. With the ability to classify wastes as LLW or TRU, the sites can consider different options for disposal of many of the different categories of glass contaminated components resulting from vitrification of HLW. Possible disposal options include LLW disposal, TRU waste disposal at the Waste Isolation Pilot Plant (WIPP), mixed TRU waste disposal at WIPP, and HLW disposal at YM. A decision analysis process was then administered for each anticipated waste stream to determine what the feasible options were. In general, the process began by assuming that the waste would either meet or fail the incidental waste criteria. Then each path was further segmented to allow for all possible options. Finally, each disposal option was compared to a reference case to determine if it was more or less likely to be cost effective, technically feasible, timely, protect human health and the environment, and for ease of implementation.

Specific waste streams from the WVDP vitrification process were then analyzed using the same decision analysis method to determine how well the process works, and to identify possible disposal options for WVDP glass contaminated wastes. The results of the decision analysis process were then formalized so that it could be presented to the management of WVDP, West Valley Nuclear Services (WVNS), and eventually to the entire DOE complex.

At the workshop, DOE-HQ suggested that NRC involvement in the incidental waste determination should be solicited. From this, several DOE sites expressed interest in implementing a memorandum of understanding (MOU) between DOE-HQ and NRC for the review and determination process for incidental waste classification, similar to the MOU already established between SRS and the NRC for the review of the HLW tank closure methodology.

To view or obtain copies of handouts from the workshop, please see John Contardi in T-7C14 (415-6680).

Attachments: DOE M 435.1 Section II.B(2)
Attendee List

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Workshop, August 3-5, 1999
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CHAPTER II

HIGH-LEVEL WASTE REQUIREMENTS

A. Definition of High-Level Waste. High-level waste is the highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation.

B. Waste Incidental to Reprocessing. Waste resulting from reprocessing spent nuclear fuel that is determined to be incidental to reprocessing is not high-level waste, and shall be managed under DOE's regulatory authority in accordance with the requirements for transuranic waste or low-level waste, as appropriate. When determining whether spent nuclear fuel reprocessing plant wastes shall be managed as another waste type or as high-level waste, either the citation or evaluation process described below shall be used:

(1) **Citation.** Waste incidental to reprocessing by citation includes spent nuclear fuel reprocessing plant wastes that meet the description included in the Notice of Proposed Rulemaking (34 FR 8712) for proposed Appendix D, 10 CFR Part 50, Paragraphs 6 and 7. These radioactive wastes are the result of reprocessing plant operations, such as, but not limited to: contaminated job wastes including laboratory items such as clothing, tools, and equipment.

(2) **Evaluation.** Determinations that any waste is incidental to reprocessing by the evaluation process shall be developed under good record-keeping practices, with an adequate quality assurance process, and shall be documented to support the determinations. Such wastes may include, but are not limited to, spent nuclear fuel reprocessing plant wastes that:

(a) Will be managed as low-level waste and meet the following criteria:

1. Have been processed, or will be processed, to remove key radionuclides to the maximum extent that is technically and economically practical; and

2. Will be managed to meet safety requirements comparable to the performance objectives set out in 10 CFR Part 61, Subpart C, *Performance Objectives*; and

3. Are to be managed, pursuant to DOE's authority under the *Atomic Energy Act of 1954*, as amended, and in accordance with the provisions of Chapter IV of this Manual, provided the waste will be incorporated in a solid physical form at a concentration that does not exceed the applicable concentration limits for Class C low-level waste as set out in 10 CFR 61.55, *Waste Classification*; or will meet alternative requirements for waste classification and characterization as DOE may authorize.

(b) Will be managed as transuranic waste and meet the following criteria:

1. Have been processed, or will be processed, to remove key radionuclides to the maximum extent that is technically and economically practical; and

2. Will be incorporated in a solid physical form and meet alternative requirements for waste classification and characteristics, as DOE may authorize; and

3. Are managed pursuant to DOE's authority under the *Atomic Energy Act of 1954*, as amended, in accordance with the provisions of Chapter III of this Manual, as appropriate.

C. Management of Specific Wastes. The following provide for management of specific wastes as high-level waste in accordance with the requirements in this Chapter:

(1) **Mixed High-Level Waste.** Unless demonstrated otherwise, all high-level waste shall be considered mixed waste and is subject to the requirements of both the *Atomic Energy Act of 1954*, as amended, the *Resource Conservation and Recovery Act*, as amended, DOE O 435.1, *Radioactive Waste Management*, and this Manual.

(2) **TSCA-Regulated Waste.** High-level waste containing polychlorinated biphenyls, asbestos, or other such regulated toxic components shall be managed in accordance with requirements derived from the *Toxic Substances Control Act*, as amended, DOE O 435.1, *Radioactive Waste Management*, and this Manual.

D. Complex-Wide High-Level Waste Management Program. A complex-wide program and plan shall be developed as described under *Responsibilities*, 2.B and 2.D, in Chapter I of this Manual.

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