



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 28, 1997

RELEASED TO THE PDR

6/4/97
date

DKW
initials

MEMORANDUM TO: L. Joseph Callan
Executive Director for Operations

FROM: John C. Hoyle, Secretary

SUBJECT: STAFF REQUIREMENTS - SECY-97-083 -
CLASSIFICATION OF HANFORD LOW-ACTIVITY TANK
WASTE FRACTION AS INCIDENTAL

70-3091

The Commission has approved the proposed letter to DOE with the changes indicated in the attachment. The letter emphasizes that the preliminary findings are contingent on proper characterization of the waste and that a re-evaluation by NRC of compliance with the waste criteria is needed if different radionuclides are discovered in the tank waste or if the radionuclide inventory is found to be higher than current estimates.

The NRC has the regulations, regulatory guides, technical positions, and qualified staff for conducting a licensing review of the type of facility being proposed by DOE for the disposal of incidental waste at Hanford. The External Regulatory Task Force should consider the Hanford incidental waste disposal facility as a candidate for external regulation by NRC.

(EDO)

(SECY Suspense: 6/30/97)

The final determination of the subject wastes can be classified a technical matter. Absent any unforeseen policy issues, the staff should inform the Commission of its final determination.

Attachment:
As stated

DFCB 9/1

SECY NOTE: THIS SRM, SECY-97-083, AND THE COMMISSION VOTING RECORD CONTAINING THE VOTE SHEETS OF ALL COMMISSIONERS WILL BE MADE PUBLICLY AVAILABLE 5 WORKING DAYS FROM THE DATE OF THIS SRM.

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PDR 10CFR
PT9.7

PDR



cc: Chairman Jackson
Commissioner Rogers
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
OGC
CIO
CFO
OCA
OIG
Office Directors, Regions, ACRS, ACNW, ASLBP (via E-Mail)
PDR
DCS

Mr. Jackson Kinzer, Assistant Manager
Office of Tank Waste Remediation System
U.S. Department of Energy
Richland Operations Office
P.O. Box 550
Richland, WA 99352

SUBJECT: CLASSIFICATION OF HANFORD LOW-ACTIVITY TANK WASTE FRACTION

Dear Mr. Kinzer:

The U.S. Nuclear Regulatory Commission has received your letter dated November 7, 1996, requesting NRC agreement that the Hanford tank waste planned for removal from the tanks and disposal on-site is incidental waste [i.e., not high-level waste (HLW)] and, therefore, would not be subject to NRC licensing authority. In response to your request, NRC and contractor staff [Center for Nuclear Waste Regulatory Analyses (CNWRA)] have reviewed the "Technical Basis for Classification of Low-Activity Waste Fraction from Hanford Site Tanks" (Technical Basis report) and supporting documents, including the "Hanford Low-Level Tank Waste Interim Performance Assessment" (Interim Performance Assessment (PA)), to determine whether there is reasonable assurance that the tank waste slated for disposal as low-activity waste (LAW) meets the incidental waste classification criteria specified in the March 2, 1993, letter from R. Bernero, NRC, to J. Lytle, U.S. Department of Energy (DOE).

Criterion One from the March 1993 letter specifies that "...wastes have been processed (or will be further processed) to remove key radionuclides to the maximum extent that is technically and economically practical." To comply with this criterion, available separation technologies were identified for each of the main radionuclides of interest and individually evaluated to determine the status of the technology and the radionuclide removal efficiency. Three separation technologies were deemed both technically and economically practical. Currently, it is expected that all three will be used. The three technologies include a simple solids-liquids separation, removal of transuranics wastes from selected tanks, and single-cycle ion exchange removal of cesium-137 from certain wastes. Approximately 3.1×10^{17} Bq (8.5 MCi) of activity will remain in the LAW, which corresponds to about 2 percent of the estimated 15.6×10^{18} Bq (422 MCi) generated at the Hanford site (based on a December 31, 1999, decay date).

NRC staff concludes that available separation processes have been extensively examined to determine those that are both technically and economically practical, and that the residual 2 percent of the activity generated at the Hanford site represents the maximum amount of separation currently technically and economically practical for this case. It is considered that Criterion One for classifying the Hanford site LAW fraction as incidental waste will be met if the waste management plan presented in the Technical Basis report is followed. Note that if actual radionuclide inventories, either in the tanks or following separation, are significantly higher than or different in character from those projected, compliance with this criterion will require re-evaluation by NRC.

Compliance with Criterion Two, "...wastes 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 Part 61," was determined using the estimated total vitrified waste volume (158,000 m³) (42,000,000 gallons) in conjunction with projected radionuclide activities. From these calculations, which NRC staff verified, the vitrified waste form is expected to meet the limits for Class C or less, as specified. Note that molten metal processing is also being considered for the LAW form. This method would considerably decrease the total waste form volume such that the waste classification could be affected. If the radionuclide inventories in the LAW are significantly higher than those projected in the Technical Basis report, or if the waste form type or total volume are altered, re-evaluation of conformance with this criterion will be necessary.

To evaluate Criterion Three, "...wastes are to be managed, pursuant to the Atomic Energy Act, so that safety requirements comparable to the performance objectives set out in 10 CFR Part 61, Subpart C are satisfied," an Interim PA was prepared. The DOE PA was performed to the requirements of DOE Order 5820.2A, "Radioactive Waste Management," September 26, 1988. This order is similar with respect to the 10 CFR Part 61 performance objectives.

The Interim PA is the first of three PAs planned and is somewhat preliminary; it was conducted before selection of a disposal facility site and design, specific treatment alternatives, or LAW form, or a complete and verified radiological and chemical characterization of the contents of the Hanford tanks. Our review identified a number of specific issues and concerns associated with the Interim PA, documented in the February 6, 1997, Request for Additional Information (RAI) from M. Bell, NRC, to D. Wodrich, DOE, and discussed in the enclosed CNWRA report. DOE's responses to the RAI constitute Appendix B to the CNWRA report. Many of the RAI comments cannot be fully resolved until the site, facility design, and solidification process are selected. It is expected that uncertainties and concerns identified with respect to the Interim PA can be satisfactorily addressed in the subsequent PAs.

Although the Interim PA is preliminary, it indicates that the performance objectives of Part 61 will be met. Consistent with the preliminary nature of this Interim PA, the staff's preliminary finding is that Criterion Three appears to be satisfied. As the disposal facility site is chosen, the disposal facility design is completed, treatment alternatives are selected, and the LAW form is determined, and proper characterization of the contents of the tanks is confirmed, the various assumptions and input parameters are likely to be further refined. Please submit future PAs as supplements to the Technical Basis report so that they can be reviewed to confirm the current analysis and resolve any outstanding issues.

Based on the preliminary information provided in the DOE Technical Basis report and the Interim PA, the staff's preliminary finding is a provisional agreement that the LAW portion of the Hanford tank waste planned for removal from the tanks and disposal on-site is incidental waste and is, therefore, not subject to NRC licensing authority. Staff considers that the information

presented is not sufficient to make an absolute determination at this time. Note that if the Hanford tank waste is not managed using a program comparable to that set forth in the Technical Basis report, or the current characterization of tank contents is not confirmed, the incidental waste classification must be revisited by DOE, and the NRC consulted. As a fundamental element of the incidental waste classification, DOE must ensure the contractors that perform LAW separation and disposal do so in accordance with the criteria set forth in the March 1993 letter and the approved Technical Basis report.

Successive PAs should be submitted as supplements to the Technical Basis report so that they can be reviewed to confirm the current analysis and resolve any outstanding issues. Other specific changes that would necessitate DOE re-evaluation and further consultation with NRC include, but are not limited to, the following:

- 1) Continuing characterization of tank waste results in a determination that the radionuclide inventory in the HLW tanks is higher than or different from that used to develop the Technical Basis report and the Interim PA. This would affect the resolution of all three criteria.
- 2) The LAW fraction of the Hanford tank waste is not vitrified, or the final volume of the waste form is significantly different from that projected in the Technical Basis report. The waste form is a determining factor in classification of waste as Class A, B, or C (Criterion Two), and would also impact PA (Criterion Three).
- 3) Final selection of the LAW disposal site, or changes to site characterization parameters will affect the resolution of Criterion Three.

If you have any questions about the details of this letter, please contact Michael Bell of my staff at (301) 415-7286.

Sincerely,

Carl J. Paperiello, Director
Office of Nuclear Material Safety
and Safeguards

Enclosure: As stated