John T. Conway, Chairman
A.J. Eggenberger, Vice Chairman
John W. Crawford, Jr.
Joseph J. DiNunno
Herbert John Cecil Kouts

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

625 Indiana Avenue, NW, Suite 700, Washington, D.C. 20004
(202) 208-6400

July 19, 1993

The Honorable Hazel R. O'Leary
Secretary of Energy
Washington, DC 20585

Dear Secretary O'Leary:

On July 19, 1993, the Defense Nuclear Facilities Safety Board, in accordance with 42 U.S.C. § 2286a(5), unanimously approved Recommendation 93-5 which is enclosed for your consideration. Recommendation 93-5 deals with Hanford Waste Tanks Characterization Studies.

42 U.S.C. § 2286d(a) requires the Board, after receipt by you, to promptly make this recommendation available to the public in the Department of Energy's regional public reading rooms. The Board believes the recommendation contains no information which is classified or otherwise restricted. To the extent this recommendation does not include information restricted by DOE under the Atomic Energy Act of 1954, 42 U.S.C. §§ 2161-68, as amended, please arrange to have this recommendation promptly placed on file in your regional public reading rooms.

The Board will publish this recommendation in the Federal Register.

Sincerely,

John T. Conway
Chairman

Enclosure

Copy to: Mark B. Whitaker, DR-1

RECOMMENDATION 93-5 TO THE SECRETARY OF ENERGY
pursuant to 42 U.S.C. § 2286a(5)
Atomic Energy Act of 1954, as amended.

Dated: July 19, 1993

Since its beginning almost four years ago, the Board has assigned one of its highest priorities to assurance of safety at the high level nuclear waste storage tanks at the Hanford Site. The Board addressed two of its sets of recommendations (90-3 and 90-7) to potential hazards associated with tanks containing ferrocyanide compounds and pointed to the need for action in connection with tank 101-SY, which periodically vents flammable mixtures of nitrous oxide and hydrogen gas. In Recommendation 90-7, the Board emphasized the urgent need for more rapid and complete sampling and analysis of tank wastes. The wastes in the Hanford tanks differ markedly from tank to tank. Identification of what specifically is in each tank is essential and urgent. Without timely characterization of the wastes, the nature of the risks associated with the tanks cannot be fully assessed and, where necessary, mitigated. Further, until the characteristics of the wastes are known, final methods for tank waste monitoring, retrieval, transport, and treatment cannot be realistically established.

The Board has repeatedly expressed its dismay at the continued slow rate of conduct of this characterization program and has urged a greater rate of progress. At last count only 22 of the 177 tanks on the site have been sampled. Only four of those sampled were among the 54 tanks on the watch list of tanks that generate the greatest safety concerns. The number of samples per tank continues to be insufficient to provide adequate characterization of the full tank. While the published schedules for sampling and analysis promise improvement, they seem optimistic when viewed against the record to date. They appear to present wishes rather than anticipated activities.

Two sets of problems appear to be principal contributors to the slow pace of characterization of the contents of the tanks. The first is a complex of factors acting to impede access to the interiors of the tanks and extraction of samples of their contents. The second is the exhaustive set of measurements made on each sample, along with limitations on laboratory capability for completing these measurements. The Board notes that measurements made for safety purposes do not necessarily receive priority over those done for other reasons, such as satisfaction of formal EPA-related requirements for final waste disposition.

The Board believes that accelerating the pace of the program of characterizing the contents of Hanford's high level nuclear waste tanks is important to nuclear safety at this important defense site. This view is shared by other experts, including DOE's own "Red Team", which reviewed the waste characterization program for the Hanford Tank Farm (DOE-EM, July 1992, Independent Technical Review of Hanford Tank Farm Operations). Characterization is essential for ensuring safety in the near term during custodial management and remedial activities, and also in the long term for advancing the development of permanent solutions to the high level waste problems at Hanford.

In addition to the matter of acceleration and reprioritization of the sampling schedules, the Board is also concerned about the sampling effort itself. The Board notes that a recently released DOE/RL audit (DOE-RL/OPA Audit 93-02, April 1993) of the sampling programs revealed significant weaknesses in the control, management, and technical implementation of core sampling, laboratory, and supporting activities.

Because the failure to vigorously pursue tank waste characterization raises important health and safety issues, DOE needs to take action to accelerate and strengthen the management of the characterization effort to ensure adequate protection of public health and safety.

Therefore, the Board recommends that DOE:

1. Undertake a comprehensive reexamination and restructuring of the characterization effort with the objectives of accelerating sampling schedules, strengthening technical management of the effort, and completing safety-related sampling and analysis of watch list tanks within a target period of two years, and the remainder of the tanks by a year later;

    a. In accordance with the above, give priority in the schedule of tanks to be sampled to the watch list tanks and others with identified safety problems, and priority to the chemical analyses providing information important to ensuring safety in the near term during the period of custodial management. Other analyses, required by statutes such as the Resource Conservation and Recovery Act prior to final disposition of the waste, should not be cause for delay of safety-related analyses. In most cases, analyses needed for long-term disposition may be postponed until more pressing safety-related analyses are completed.

    b. Reexamine protocols for gaining access to the tanks for sampling with the objective of simplifying documentation and approval requirements.

    c. Increase the laboratory capacity and activities dedicated to tank sample analysis:

        (i) Expedite efforts to obtain and begin utilizing additional sampling and analytical equipment now being procured, and the training of personnel needed for an enlarged through-put capacity.

        (ii) Explore availability and utility of laboratory services on- and off-site, such as Hanford's Fuel Materials and Examination Facility and the INEL and LANL laboratories, for accelerating the waste characterization effort.

2. Integrate the characterization effort into the systems engineering effort for the Tank Waste Remediation System:

   a. Schedule tank sampling consistent with engineering and planning for removal, pre-treatment, and vitrification of the tank wastes.

   b. Critically examine the list of chemical analyses done on samples to establish the smallest set needed to satisfy safety requirements.

   c. Strengthen the management and conduct of the sampling operations.

John T. Conway, Chairman