

February 6, 2003

The Honorable Jessie Hill Roberson  
Assistant Secretary for Environmental Management  
U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-0113

Dear Ms. Roberson:

The Defense Nuclear Facilities Safety Board (Board) continues to follow efforts of the Department of Energy (DOE) and its contractor to safely stabilize deteriorating spent nuclear fuel stored in the K-East and K-West Basins at Hanford, in accordance with the Secretary's Implementation Plan for Recommendation 94-1, *Improved Schedule for Remediation in the Defense Nuclear Facilities Complex*, and Recommendation 2000-1, *Prioritization for Stabilizing Nuclear Materials*.

Prompted by a leak test failure, the Board, in its letter of February 15, 2002, discussed deficiencies in the process for mechanically sealing the spent fuel containers, or Multi-Canister Overpacks (MCOs). MCOs are mechanically sealed in the K-West Basin, using closure bolts, to allow transport to the Cold Vacuum Drying Facility for processing, followed by transport to the Canister Storage Building for interim storage and final sealing via welding. MCOs 1 through 40 have been removed from the K-West Basin without a torque check of the closure bolts and, even having passed a leak check, the continued adequacy of the mechanical seals cannot be ensured. An inadequate mechanical seal could allow the inert atmosphere of the MCO to be lost prior to welding, leading to the introduction of oxygen and possibly violent reactions and/or explosions.

The Board's letter requested information regarding accelerated welding of the 40 MCOs with suspect seals. The DOE response letter, dated April 18, 2002, committed to accelerate welding of the first 40 MCOs, after checking closure bolt torque and ensuring that any MCOs which failed the torque check were properly sealed and inerted. In addition, DOE added a requirement to check the closure bolt torque for subsequent MCOs at the K-West Basin.

In May 2002, MCO 63 failed the leak test at the Cold Vacuum Drying Facility after having passed the required torque check at the K-West Basin. A subsequent torque check of MCO 63 at the Cold Vacuum Drying Facility indicated significant torque relaxation from the values measured during the torque check at the K-West Basin. It should be noted that there will be lifting stresses imposed on the

mechanical seal during movements at the Canister Storage Building that might contribute to torque relaxation.

In addition to leak test failures, a small population of MCOs that passed the leak test exhibited leakage rates several orders of magnitude higher than most other MCOs. These higher than normal leak rates raise questions concerning the adequacy of the mechanical seal.

In discussions with DOE and its contractor, the Board's staff has communicated its concern with further leak test failures and higher than normal leak rates, and has suggested that all MCOs be retorque-checked prior to welding. However, the current welding procedure requires verification of torque only for MCOs that did not receive an initial torque check in the K-West Basin. Because of the continuing uncertainty regarding the adequacy of the mechanical seals, the Board believes that this is not a conservative approach.

The Board believes it would be appropriate for DOE to require a final torque check of closure bolts for all MCOs prior to welding, as well as appropriate corrective actions to ensure that MCOs that fail the torque check are properly sealed and inerted. Therefore, pursuant to 42 U.S.C. § 2286b(d), the Board requests that DOE provide a report within 15 days of receipt of this letter that provides assurance that MCOs are properly sealed and inerted prior to welding, and the proposed disposition of any MCOs that have already been welded.

Sincerely,

John T. Conway  
Chairman

c: Mr. Keith A. Klein  
Mr. Mark B. Whitaker, Jr.