DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 21, 1995

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: J. Deplitch

SUBJECT: Report on Hanford Emergency Response Exercise "Oz"

1. **Purpose:** This report documents Defense Nuclear Facilities Safety Board's (Board) staff observations made during the conduct of Emergency Preparedness and Response Exercise "Oz." The exercise was conducted through most of the day, June 22, 1995, by Westinghouse Hanford Company (WHC) for the Department of Energy (DOE) Richland Operations Office (RL). Board staff observers were J. Deplitch and D. Thompson, with assistance from E. Dietrich of SPC.

2. **Summary:** Exercise "Oz" was a full-participation exercise to demonstrate the ability of Hanford, State, and local emergency response organization members to handle emergency conditions at the Hanford Site. All levels of Hanford Site emergency response participated, from the facility to the RL Emergency Operations Center (EOC). Offsite State, County, and local agencies responded with representatives or liaisons to the RL EOC and Joint information Center (JIC), and activated EOCs, as appropriate. Kadlec Hospital received and treated a simulated contaminated casualty.

   The Hanford Site demonstrated the availability and use of required emergency response equipment and resources. The exercise included: simulated physical damage to the 105-KW basin transfer area, contamination, an hour-long fire, casualties, and a fatality. Overall, the Board staff observers considered that Hanford marginally demonstrated its ability to respond to an emergency.

3. **Background:** Exercise "Oz" was an emergency preparedness and response exercise intended to demonstrate the proficiency of the DOE contractor emergency response organization for responding to a simulated emergency at Hanford.

   WHC based Exercise "OZ" on a simulated accident at the 105-KW basin transfer area. A disturbed and armed employee gained control of a train for scheduled fuel shipment from PUREX at the 100-K west-side rail gate. He crashed the train through the 105-KW basin transfer area west wall. The derailer derailed the train as it approached the 105-KW transfer area. The engine slid on its side into the 105-KW transfer area west wall. The transfer well car overturned and spilled the entire contents, but stopped short of the building. The three fuel casts were thrown from the well car and remained intact. Engine impact caused: destruction of the ion exchange modules with resin beads scattered throughout the transfer area and outside the basin;

pulverization of the nine ion exchange columns with scattered contaminated resin; destruction of the south and center roll-up doors to the transfer area; and spread of diesel fuel through the transfer area. Electrical shorts ignited paint supplies. The resulting fire ignited the diesel fuel, contaminated resin beads, burial boxes, and other miscellaneous combustible material located in the transfer area, and burned for 56 minutes. Seven individuals were involved in the accident: the disturbed employee was killed instantly; the facility manager sustained injuries that required medical attention; a facility operator was severely injured and trapped under debris in the transfer area; three rail crew members sustained minor injuries; a health physics technician (HPT) was uninjured; and all except the HPT were contaminated by the debris and/or fire.

Board staff observers used the Federal Emergency Management Agency (FEMA) evaluation methodology set forth in FEMA-REP-15, "Radiological Emergency Preparedness Exercise Evaluation Methodology," dated September 1991; and Drills and Exercises (abbreviated as, DOE D&E) and DOE Emergency Exercise Evaluation Criteria (abbreviated as, DOE EEEC) published in the DOE Emergency Management Guide, dated December 11, 1991.

4. Discussion/Observations:

Board staff observed activities of exercise conduct and control, and activities at the accident scene, event command post (ECP), staging area, area emergency control center (ECC), and joint RL EOC. Activities in the Joint Information Center and offsite were not observed. Hanford performed timely notifications, responded to the accident, evaluated the accident, and practiced exercise procedures. The scenario did not require getting control of the hazards. The only release was the plume from the fire; other hazards remained in the building. Poor communications and planning between the initial responders and the ECP and within the ECP prevented any clear picture of the accident scene and evaluation of the hazards for hours.

Hanford had adequate emergency response facilities. Hanford recently extensively remodeled the RL EOC. The RL EOC provided constructive facilities for the Emergency Management Team (EMT) and all of its support teams. The Northern Area ECC was in a dedicated room with workstations and support materials for all of the participants. The accident situation and conditions drove selection of the ECP. Hanford apparently had developed response organizations in echelons of control and support. However, the exercise demonstrated that the ECP had to maintain continuous communications with the ECC and the RL EOC. In the past, due to the distance between the facilities and the RL EOC, an area ECC was probably very effective. Today, with modern communications and data collecting and collating techniques, the area ECC was redundant, caused information communication problems, and added a communications burden.

Partial review of emergency procedures showed that the procedures appear well documented. Documentation included response procedures for each response organization, a consolidated hazard assessment book, and a manual for classifying incidents/accidents/emergencies. Response

procedures seemed logically organized, easy to follow, and written in steps with checklists. The hazard assessment book included source terms and release values for hazards at facilities throughout the site. The book provides information to assist classification of emergencies, and to project preliminary plume and other release modes doses. WHC wrote the manual broadly and detailed enough for classifying emergencies at all facilities on the site. The manual was in decision-making steps with simple, useful tables.

During an emergency Hanford Site controls access to the site by closing State Road 240, putting boats in the Columbia River, and closing site roads. Hanford can accomplish road restrictions and notifications to Hanford facilities quickly. Notifications and restrictions on the river are time consuming and difficult. For emergency preparedness and response the river is the site's boundary to the north and east. County authorities accomplish notifications and restrictions north and east of the river. Hanford Site controls the site roads south and west of the river and has authorization from the Sheriff's Department to close State Road 240 at the Vernita Bridge and at the southern boundary of the site. Hanford can patrol and check the roads to ensure they are clear. Pacific Northwest Laboratories (PNL) are responsible for putting boats in the river and making notifications, which can take hours (three hours in this case). A public address system partially covers the river and can make announcements quickly. Hanford plans to extend the public address system to the Vernita Bridge sometime in the future. PNL and Hanford have no authority to restrict access on the river. The Coast Guard maintains authority for the river.

Hanford emergency response personnel were volunteers. Using volunteers did not seem to have an adverse effect. Volunteers appeared to come from appropriate duty assignments. DNFSB staff observers found this practice unusual. Response personnel assignments are usually based upon line organization to maintain authority, responsibility, and accountability.