DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 2, 2001

TO: K. Fortenberry, Technical Director

FROM: D. Grover and M. Sautman, Hanford Site Representatives

SUBJ: Activity Report for the Week Ending March 2, 2001

233-S: Dismantled equipment containing plutonium is stored while awaiting nondestructive assay (NDA) inside a wooden enclosure attached to two sides of 233-S. Mr. Sautman reviewed the authorization basis (AB) coverage and potential safety issues associated with this storage. The attachment summarizes the following issues with storage in the weather enclosure: it does not appear to be within the current safety envelope, it was not adequately analyzed in past unreviewed safety question (USQ) screens, it has possible compliance issues with National Fire Protection Association (NFPA) codes, and it raises concerns with the control of combustibles and ignition sources. Similar AB issues associated with the storage of waste in the yard surrounding 233-S are also being pursued. These issues have been discussed with various Bechtel Hanford Inc. (BHI) senior managers including their President as well as the Department of Energy-Richland's (DOE-RL) Deputy Manager and Assistant Manager for Standards and Engineering (AMSE). So far, BHI's response to the Site Rep has been a promise that NDA will improve and an acknowledgment that this might not be a best practice. Shirley Olinger, the new AMSE, has been very responsive to this issue (as well as the Building 325 issue below). (I-C)

Building 325: At last week's critique regarding unanalyzed storage of radioactive material outside Building 325, Mr. Sautman raised the issue of authorization basis coverage of movement of radioactive material into and out of the facility. This week, an Unreviewed Safety Question was determined to exist and movement of radioactive material has been suspended. (I-C)

Spent Nuclear Fuel Project (SNFP): The SNFP has requested that the requirement for a mandatory senior supervisory watch be lifted based on the marked improvement in conduct of operations while processing the third Multi-Canister Overpack (MCO). DOE RL is still evaluating the situation, meanwhile, the shipment of the fourth MCO scheduled for this week has been delayed due to equipment problems and the Pacific Northwest earthquake. The five available tools used to load outer fuel elements into the MCO basket have failed while loading baskets for the first four MCOs necessitating the use of a repaired tool to finish the current MCO. The project has five additional tools on order and is working to develop a simple design change to remedy the problem. There was also an temporary loss of the pneumatic system used in loading the baskets into the MCO. The problem eventually corrected itself and the project is working to understand the cause. Finally, operations were halted following the earthquake until emergency response procedures for a seismic event were completed and structural inspections determined that the facility was not adversely affected. (III-A)

cc: Board Members

Attachment: Discussion of 233-S Weather Enclosure Safety Issues

The south wooden weather enclosure was constructed several years ago. The east wooden weather enclosure was built in 1997 to add another egress point for workers. In 2000, 233-S started using the weather enclosures for staging Pu-containing items. Size reduced piping and vessels, holdup material, and other decommissioning waste items are wrapped inside two plastic bags and transported to the south weather enclosure to determine Pu content and waste type.

While awaiting assays, the bagged items are stored on the floor. Following NDA, items found to contain gram quantities of Pu are placed within a metal container. Due to inconsistent NDA support, the number of stored items and the storage time is larger than initially intended. For example, a walkdown this week found approximately 3 dozen bagged items on the floor.

Authorization Basis Issues: The current authorization basis does not discuss the storage of radioactive material in the weather enclosure or identify the possibility of a fire in the enclosure affecting this material. The closest the hazard evaluation comes to this is to acknowledge a possible fire during waste transport or a fire in a temporary structure affecting a portable exhauster (which are not used in the enclosures). A Site Rep review of a dozen USQ screens from the last 4 years found screens associated with the construction hazards for building the east enclosure and a positive USQ associated with the discovery that the south enclosure was not fire retardant (which led to the application of fire-retardant paint). However, these date back to when the enclosures were only used as an access/egress area and not for storage. The Site Rep has not been able to find any USQ screens that explicitly discuss the storage of plutonium-containing items in the enclosure. The closest thing found were USQ screens for work packages that note that waste will meet the Site Specific Waste Management Instruction.

BHI's position is that the plastic panel fire in the process cell bounds all other fires. Although the dose consequence of this fire bounds doses from other fires, the Site Rep believes the weather enclosure fire should be considered a different type of accident than previously evaluated (as discussed in DOE 5480.21, *Unreviewed Safety Questions*). The prevention and mitigative commitments (e.g., high differential pressure alarm, removal of the plastic panels, fire-retardant flex duct work) for the process cell fire focus on the plastic panels and building features which are not applicable to the weather enclosures. Using one fire scenario to bound different types of fires also results in a missed opportunity for identifying controls to prevent or mitigate a weather enclosure fire that are not applicable to a process cell fire.

The upcoming annual AB update and fire hazards analysis (FHA) revision discuss a weather enclosure fire involving 450 g of plutonium. While the off-site dose consequences are relatively low, the resulting unfiltered ground level release would be significant to workers at 233-S or the nearby 222-S labs. As discussed later, there is little, if any, defense-in-depth present with current operations. In addition, the continued inclusion of the plastic panel process cell fire scenario in these upcoming revisions is not consistent with DOE Orders 5480.23, *Nuclear Safety Analysis Reports*, or 5480.7A, *Fire Protection*, because the plastic panels were removed months ago. Keeping an irrelevant accident scenario on the books just because it will bound any other scenario has the potential to circumvent the USQ process.

National Fire Protection Association Code Issues and Industry Practice: NFPA 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials*, requires that "buildings in which radioactive materials are to be used, handled, or stored shall be fire resistive or noncombustible." Fire retardancy is not sufficient. The staff is still reviewing the applicability of this requirement to facilities being decommissioned. BHI is relying on the generic guidance on temporary enclosures in NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*. However, a preliminary staff review of NFPA 241 identified that 233-S is not meeting the requirement for temporary structures to be separated from the building by at least 30 feet nor are they removing waste material from the structure at the end of each shift.

Plutonium-containing items are usually transported outside in metal drums or boxes. In many places, double containment is required. Relying on just 2 plastic bags is much less protective. The staff is also aware of only one other DOE facility where items containing uranium or plutonium are stored in a wooden facility. A facility at Y-12 stores depleted uranium in a

wooden shed equipped with fire sprinklers, but this facility is hardly ideal either. The use of a wooden weather enclosure at 233-S to store gram quantities of Pu is a significant departure from standard DOE practice.

Control of Combustibles and Ignition Sources: Site Rep walkdowns indicate that 233-S administrative controls to "keep the combustible loading to a minimum required for D&D" and daily Field Superintendent checklists are not very effective. The storage of combustibles near possible ignition sources also concerns the Site Rep. An inspection this week found a laundry bag stuffed with cotton towels stored under a wall-mounted space heater and rolls of tape within inches of the same heater. The towels are used to soak up rainwater that leaks into the facility. (The facility representative reported that all these towels had been hung up to dry inside the enclosure a few days before). Other rain-related combustibles included several mop heads and wooden pallets used to keep NDA equipment off the sometimes wet ground. Other pieces of wood were laying on the floor or against the wall. Fire retardant plastic (still combustible though) covers the floor and walls of the east enclosure. Past events also illustrate the possibility of an exterior ignition source. A few weekends ago, a fire occurred in a nearby trailer when a space heater (different model), not designed for continuous use and not maintained, overheated. This fire was not detected until workers returned to work Monday. In addition, last year's range fire reached 10th St. in front of 233-S and REDOX.

Note: The NFPA 801 code compliance issues were identified by DOE-RL's fire protection engineer and the facility representatives have had similar observations on the efficacy of the combustible and ignition control programs. These individuals have been able to resolve several weaknesses in the FHA. The above discussion summarizes issues not resolved yet and several new issues identified by the Board staff.