DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 24, 2004

TO: J. Kent Fortenberry, Technical Director
FROM: R. Todd Davis/Donald Owen, Oak Ridge Site Representatives
SUBJ: Activity Report for Week Ending November 26, 2004

The site reps. will be out of the office on Thursday and Friday.

A. Near-Miss Electrical. This week, BWXT completed their investigation of the recent electrical near-miss at the Special Materials Processing building (see site rep. weekly 10/29/04). The investigation team concluded that the Integrated Safety Management System implementation was inadequate for work conducted by support and service personnel. The team also noted weaknesses in the control/authorization of work and training on facility-specific hazards. Near-term corrective actions have been implemented by BWXT management that include additional evaluation and communication of activities performed by support and service personnel. A long-term corrective action plan is being developed. BWXT is also developing a lessons learned package to communicate this issue to other DOE sites.

B. Saltless Direct Oxide Reduction. BWXT continues to develop the Saltless Direct Oxide Reduction (SDOR) technology to replace hydrofluorination and reduction processes used to produce enriched uranium metal buttons. Earlier SDOR development testing resulted in an explosion and fire in a glovebox in April 2003 (see site rep. weeklies 4/18/03, 4/25/03 and 5/2/03). Corrective actions and lessons learned from this event are being factored into the prototype design and hazards analysis including a redesigned oxide dissolution system and prohibition of sealed containers. During 2005, BWXT plans to complete design and construction of the SDOR prototype and start operations using depleted uranium. During 2006, additional runs are to be completed to support development of design requirements for a production facility and to make a decision on whether to proceed with SDOR for enriched uranium metal production.

C. New Cooling System for Casting Operations. Cooling water is needed to cool seals and mating surfaces for the casting furnaces in the Enriched Uranium Operations building. Cooling water has been supplied from an open-loop supply of cooling water from the facility. If leaks occurred in the cooling water channels, it would be possible to fill the furnace and create the potential for a criticality accident. As a result, check valves, a water detection system, and operator action were relied on as safety basis controls to prevent water from filling the furnace. BWXT has redesigned the cooling water supply to a closed-loop system that limits the amount of water that could be delivered to the furnace. Based on use of redesigned cooling system, YSO has approved elimination of the prior safety basis controls. Modifications for all the casting furnaces are in progress and are expected to be completed by mid-December.

D. Off-Specification Uranyl Nitrate Solutions. As part of the uranium disposition program, BWXT plans to process approximately 180 safe bottles of off-specification uranyl nitrate solutions stored in a legacy uranium processing building. These solutions will be converted to an oxide using a lab scale precipitator and a calcining tube furnace in the special processing area of the Enriched Uranium Operations building. BWXT has concluded that this activity is adequately covered under the existing Basis for Interim Operation and does not represent an unreviewed safety question. A contractor Readiness Assessment (RA) will be performed with BWXT as the startup authority. The RA is scheduled for early January. The duration of this campaign is expected to be approximately 4 months. The resulting uranium oxide will be shipped off-site as a part of the uranium blend down program.