**DEFENSE NUCLEAR FACILITIES SAFETY BOARD**

TO: Steven Stokes, Technical Director
FROM: William Linzau and Rory Rauch, Site Representatives
SUBJECT: Oak Ridge Activity Report for Week Ending November 22, 2013

**Direct Electrolytic Reduction (DER)/Electrorefining (ER):** B&W recently issued a report summarizing the DER and ER technology development progress in fiscal year (FY) 2013. ER, a process to purify uranium metal, is the more mature technology. Experiments to date resulted in metal yields that approach the values needed for production applications; however, the quantity of some contaminants was larger than desired. In FY13, the ER development team used a parametric study to trace the source of the contaminants to certain materials of construction in the ER cell. The team is procuring alternate materials to address the issue. DER, a process that converts uranium oxide to metal, is the less mature technology. The DER development team has not attained the desired conversion efficiency during larger scale experiments. In FY14, the team plans to perform additional experiments to determine which specific factors (e.g., current density, basket size) are limiting conversion efficiency. ER is currently at technology readiness level (TRL)-4 and DER is at TRL-3. B&W plans to achieve TRL-6 for ER by June 2014 and TRL-6 for DER by the end of FY14.

B&W's plan to deploy and operate DER and ER capabilities in Building 9215 is a critical component of Y-12's strategy for shutting down the enriched uranium purification and metal production capabilities currently housed in Building 9212. B&W is preparing the critical decision-1 package for ER deployment, which is currently being treated as a major modification to Building 9215 (see 8/16/13 report). B&W is in the process of updating its transition plan for Building 9212 (see 9/13/13 report) to include the latest timeline for the startup of DER and ER capabilities in Building 9215 and the shutdown of enriched uranium purification and metal production capabilities in Building 9212.

**Oak Ridge National Laboratory (ORNL):** The ORNL Liquid Low-Level Waste System Documented Safety Analysis assumes a damage ratio of 25 percent for events involving the structural failure of tanks larger than 1500 gallons. Last week, URS/CH2M Oak Ridge (UCOR) declared a potential inadequacy of the safety analysis (PISA) after determining that there is not an adequate engineering basis for this assumption. UCOR identified several interim compensatory measures in response to the PISA, including the prohibition of hoisting and rigging activities over the affected tanks and limits on the inventory of low-level waste in the affected tanks. UCOR plans to submit an evaluation of the safety of the situation to OREM early next week. UCOR is performing finite element modeling of the tanks' response to the postulated events as a means of establishing a damage ratio with an adequate engineering basis.

**Transuranic Waste Processing Center (TWPC):** In September, the OREM contracting representative for TWPC issued a letter to the General Manager of Wastren Advantage, Inc. (WAI) expressing OREM's concern with the rigor of operations at TWPC (see 9/27/13 report). Last Friday, WAI submitted the causal analysis and management plan to address the 11 events that formed the basis for OREM's concern. In order to identify overarching conclusions and improvement actions, WAI commissioned an independent team of consultants to perform a collective significance analysis of the root causes for each event. During this analysis, the team identified five program areas that need improvement (conduct of operations, administrative controls, engineering/design, training, and management/quality assurance). The team identified common causes in each program area and developed a set of overarching improvement actions.