

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

TO: Timothy Dwyer, Technical Director  
FROM: William Linzau and Rory Rauch, Site Representatives  
SUBJECT: Oak Ridge Activity Report for Week Ending November 30, 2012

W. Linzau began his assignment as a Board site representative in Oak Ridge. B. Broderick, R. Kazban, and C. Shuffler were at Y-12 to walk down Building 9212, Building 9215, Building 9204-2E, and select development activities.

**Technology Development:** B&W continues to progress in its development of direct electrolytic reduction (DER, a process to convert uranium oxide to uranium metal) and electrorefining (ER, a process to purify uranium metal) technologies for Y-12 mission applications (see 4/20/12 report). Towards the end of last fiscal year (FY), development personnel installed a second generation ER prototype. The second generation ER prototype contains modifications (e.g., different electrolyte) for improved compatibility with the DER prototype. The first two runs with the second generation ER prototype produced depleted uranium metal at throughput rates close to those required for production applications. In addition, the metal contaminant levels in the product from these runs were generally within specification. The DER technology is not as mature as its ER counterpart for Y-12 applications. The DER prototype runs to date have resulted in a lower throughput than expected. B&W's Acceleration Plan for the Uranium Processing Facility (see the 3/23/12 report) identified that production versions of the DER and ER processes need to be installed in Building 9215 by the end of FY 2016. Subsequently, B&W revised the date for DER deployment to FY 2019 after coordination with NNSA program managers to firm up funding within budget targets. B&W believes that this deployment date is still consistent with the programmatic needs described in the Acceleration Plan.

**Safety Basis Quality:** Last week, NPO issued a letter to B&W identifying several issues with the quality of B&W's safety basis submittals during the last year. One of the five examples provided involved B&W's failure to incorporate a safety basis supplement into the Highly Enriched Uranium Materials Facility safety basis during the latest annual update of the document. NPO had required this action in its initial approval of the safety basis supplement. In the letter, NPO indicated that these issues reflect the need for B&W to improve its independent review processes for safety basis documents. The letter requests that B&W review the issues provided and implement any necessary process improvements.

**Respirator Malfunction:** Last week, during preparation for a maintenance activity in Building 9212, the corrugated breathing tube on a supplied-air respirator ruptured within seconds of being connected to the breathing air system. Within minutes of the event, the radiological control supervisor suspended the maintenance activity. Within hours, B&W had suspended all supplied-air respirator activities at Y-12. Industrial hygiene personnel performed an evaluation of the respirator in question. The evaluation indicated that the likely cause of failure was a valve at the connection between the mask and the ruptured tube that had been installed incorrectly when the respirator was reconditioned. B&W returned the equipment to the manufacturer for a definitive analysis of the failure. B&W subsequently reduced the scope of its suspension of supplied-air respirator activities to apply to only reconditioned respirators.