

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 27, 2009

TO: Timothy Dwyer, Technical Director
FROM: Donald Owen and David Kupferer, Oak Ridge Site Representatives
SUBJECT: Activity Report for Week Ending February 27, 2009

Staff member John Abrefah visited Y-12 to augment site rep. coverage.

Highly Enriched Uranium Materials Facility (HEUMF). B&W has received nearly all testing results for the program to address the lack of vendor Quality Assurance program documentation for safety-class storage rack fasteners (see the 2/13/09 and referenced site rep. reports). In general, the test results show the installed fasteners are compliant with applicable American Society for Testing and Materials specifications for tensile, hardness and chemistry/material properties. The hardness testing for three lots of bolts is being re-performed using a preferred method (i.e., testing the cross-section of the bolt shaft verses the head of the bolt, which has likely been work hardened). In addition, B&W continues to work with the vendor to address a missing Certified Material Test Report (CMTR) for one lot of bolts and discrepancies between bolt head-markings and the head-markings indicated on certain other CMTRs.

In April 2006, B&W developed a Lessons-Learned Report for HEUMF. B&W has updated this document annually and most recently in November 2008. In the area of construction quality assurance, the document contains a detailed discussion of the reinforcing steel issues that were discovered in January 2006 and a short discussion regarding the flow-down of quality requirements to lower-tier vendors. However, the document does not contain the same level of detailed discussion regarding the numerous issues identified with concrete placements and fastener procurement and installation. The report does address lessons-learned for constructing and operating mock-ups of storage racks and the repackaging work area, but several benefits gleaned from operating the mock-ups are not discussed in the report

NNSA Headquarters Biennial Review of Y-12. NNSA Headquarters staff visited Y-12 this week to prepare for its Biennial Review planned for late March.

Furnace Reduction Operations. Furnace reduction operations remain suspended as a result of damage to two safety-significant reactor vessels identified in September (see the 1/23/09 site rep. report). B&W's engineering evaluation of the damage to the vessel base metal is discussed in two technical reports. The reports indicate that calcium, migrating from the crucible to the vessel wall and lid during the reduction reaction, is attacking the nickel-based alloy material of the vessel and lid. B&W believes that the calcium migration is the result of depletion of the argon cover gas backfilled during reactor vessel preparation. B&W personnel stated that corrective actions are being proposed including: higher backfill pressure for the argon cover gas, additional pressure checks before and after placement of the reactor vessel in the furnace, and increased torque of the fasteners for the reactor vessel lid. B&W projects completion of the Unreviewed Safety Question Determination on this issue during the next few weeks.

Microwave Casting. B&W continues work on the project to install a microwave casting unit for production use in the Enriched Uranium Operations Building (see the 3/7/08 site rep. report). B&W recently removed a conventional casting furnace to make room for the new production microwave. Preliminary design efforts are nearing completion and Critical Decision-2 approval for the project is planned for late March. Following Critical Decision-2 approval, B&W plans to place a contract with a vendor to design and fabricate the unit.