

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 21, 2008

TO: Timothy Dwyer, Technical Director
FROM: Donald Owen and David Kupferer, Oak Ridge Site Representatives
SUBJECT: Activity Report for Week Ending November 21, 2008

Criticality Safety. In October, B&W had identified fissile material processes that are not compliant with the Double-Contingency Principle (DCP) as defined in DOE Standard 3007-2007, *Guidelines for Preparing Criticality Safety Evaluations* (see the 10/17/08 site rep. report). B&W requested that YSO approve continuing operations while a revised implementation plan for DOE-STD-3007-2007 is being developed and implemented. YSO has binned the non-compliant fissile material processes into three categories: (1) processes for which geometry is the single parameter being used to ensure criticality safety, (2) processes for which concentration is the single parameter being used to ensure criticality safety, and (3) processes for which no future mission is currently identified or processes for which YSO has identified a means for being compliant with the DCP. Last week, YSO approved a deviation for the processes controlled by geometry. YSO also granted one-year approvals for processes controlled by concentration on the basis that B&W will be able to either identify an additional parameter to control or demonstrate that the analyzed changes in process conditions are incredible. YSO determined that the third category of processes (as described above) do not require an approved deviation.

YSO also recently authorized B&W to expeditiously develop and implement Criticality Safety Evaluations (CSEs) for the Highly Enriched Uranium Materials Facility (HEUMF) that are compliant with the DOE-STD-3007-2007. YSO directed B&W to complete the HEUMF CSEs prior to the start of the HEUMF Operational Readiness Reviews. YSO has also communicated its expectation that DCP requirements will be incorporated into the design of the Uranium Processing Facility.

Furnace Reduction Operations. B&W reported a Potential Inadequacy in the Safety Analysis (PISA) due to anomalies on two reduction reactor vessels and one lid. The reduction reactors are safety-significant equipment credited to withstand the pressure and temperature environment associated with reducing uranium tetrafluoride to metal. The vessels and lid had areas of damage (erosion and/or melting of the base metal) in the region of the lid closure gasket along with some damage to the gasket. The site reps. note that one of the ports in the lid had blockage, apparently from calcium deposits; such deposits had previously been observed and addressed (see the 7/25/08 site rep. report). Engineering evaluation and causal determination of the erosive/melting damage is ongoing along with completion of an Unreviewed Safety Question Determination.

During the critique convened following declaration of the PISA, it was determined that the damaged vessels were identified in late September. This fact was not mentioned in either the external occurrence report or in the internal Initial Event Information report for the PISA. In September, production operations personnel notified facility shift management that the equipment was being taken out of service and pursued the matter with certain engineering personnel. At that time, no formal reporting of the specific damage to this safety-significant equipment was made via an Initial Event Information report (see the 8/29/08 site rep. report). For more than 40 days, no formal hold on furnace reduction operations had been placed until the PISA was declared last week after a facility Shift Technical Advisor became aware of the vessel damage.