

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 18, 2009

TO: Timothy Dwyer, Technical Director
FROM: Donald Owen and David Kupferer, Oak Ridge Site Representatives
SUBJECT: Activity Report for Week Ending December 18, 2009

Staff member Todd Davis was in Oak Ridge this week to augment site rep. coverage.

Highly Enriched Uranium Materials Facility (HEUMF). On Wednesday, NNSA completed its Operational Readiness Review for startup of HEUMF and issued its final report (see last week's site rep. report). The review team commended YSO and B&W on the overall preparedness to startup HEUMF. The review team identified noteworthy practices including the rigor of the Readiness Certification Assurance process used by B&W (see the 6/5/09 site rep. report). The review team identified 5 pre-start findings and 10 post-start findings. The pre-start findings were related to the following topics: Secondary Confinement System inoperability, facility announcing system inaudibility, screening site-wide issues that potentially affect HEUMF, staging shipping containers in HEUMF, and securing containers to the storage racks.

The site reps. observed meetings regarding the corrective action plan for the pre-start finding on the inoperability of the Secondary Confinement System. B&W acknowledged that it has not yet been able to determine why the exhaust fans have repeatedly shut-down unexpectedly. B&W is planning to conduct further testing during the next several weeks. Per the approved safety basis, the exhaust fans can operate in either of the following modes: variable frequency drive (varying fan power to control air flow) or variable inlet vane (operating the fan at full power and using dampers to control air flow). The fans were operating in the variable frequency drive mode each time they unexpectedly shut-down. B&W's current plan for startup is to procedurally require operating the fans in the variable inlet vane mode (i.e., a fan operating in the variable frequency drive mode will be considered inoperable); however, no change to the HEUMF safety basis was proposed. The site reps. have inquired with YSO and B&W management on the need to address this planned restriction via a safety basis change (e.g., a Justification for Continued Operation).

Furnace Reduction Operations/Criticality Safety. The criticality safety posting on the pickling hood in the furnace reduction area allows up to three containers (any combination of button/pickling cans, cans for slag, or cans for uranium salvage metal) in each end of the hood. In late November, B&W reported a Potential Inadequacy in the Safety Analysis (PISA) because it was not immediately clear that the analysis in the Criticality Safety Evaluation (CSE) bounded the contingencies that could occur with the container configurations permitted by the posting. Two contingencies analyzed in the CSE are inadvertently adding an extra container to the hood and a water line failure that results in unexpected flooding of containers. According to the CSE, a loaded button/pickling can is the most reactive of the three containers in normal conditions. The CSE states that both of the following configurations are subcritical: (a) four button/pickling cans (extra container contingency) and (b) two button/pickling cans collocated with an internally flooded salvage can (flooding contingency). The CSE requires that the slag and salvage cans be covered (i.e., lids on) other than when loading/unloading. Because of the lid requirement, the analysis assumes it would not be credible for more than one salvage can to become flooded in the event of a water line failure. B&W completed its Unreviewed Safety Question Determination (USQD), which concludes that the CSE analysis bounds credible abnormal conditions and that no USQ exists.

During a walk-down of the reduction area, the site reps. noted that the requirement to keep lids on containers was not included on the criticality safety posting for the pickling hood. Operators present were generally aware that containers are to be kept covered (other than when loading/unloading), but they did not seem knowledgeable of the criticality safety basis for the requirement. The site reps. discussed these observations with YSO and B&W management.