

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 28, 2008

TO: J. Kent Fortenberry, Technical Director
FROM: R. Todd Davis/David Kupferer/Donald Owen, Oak Ridge Site Representatives
SUBJECT: Activity Report for Week Ending March 28, 2008

Staff members Andersen, Blackman, Burnfield and Grover, and outside expert Stevenson visited Y-12 to review Highly Enriched Uranium Materials Facility (HEUMF) construction issues.

A. Enriched Uranium Material - Unexpected Thermal Reaction. On Tuesday, operators in the Enriched Uranium Operations Building identified a storage can with its lid raised above the normal seated position. The can was being used to store enriched uranium chips that had been pressed into a briquette. Briquettes are placed individually into zip-lock bags and two briquettes are typically stored in a can. The can loading is performed in an inert atmosphere. Briquettes provide a feed source to casting operations.

The operators stopped work and notified shift management. After review by safety and supervisory personnel, other chip briquette cans were inspected. Operators identified several additional cans with raised lids including one can where a small amount of liquid could be observed inside the zip-lock bag. Operators then identified a can (inside a steel lockbox) with material that appeared to have gone through a thermal reaction. Ash was observed around the can and heat discoloration was noted on the can and inside the lockbox. The lockbox was secured and the area was administratively controlled. Following discussions with subject matter experts and a pre-job brief, operators completed the inspections of chip briquette cans (approximately 160 cans). Operators identified that about half of the cans had lids raised above the normal position. B&W has started a formal investigation. Briquette time-in-storage and a recent chip cleaning fluid change are among factors being evaluated.

B. Highly Enriched Uranium Materials Facility. The staff and site rep. reviewed recent quality assurance issues associated with HEUMF construction. The main issues addressed include:

- **Overloaded Storage Rack Bolts:** Load-indicating fastener assemblies (using direct-tension indicating washers) are used to ensure a minimum bolt load in the installation of safety-class storage racks. Several bolts have been found to be overloaded well beyond yield with some tensile failures. While identified bolts have been replaced, the staff inquired as to what prevents overloading of bolts during installation. B&W noted that a limit on turn-of-the-nut has been verbally provided to construction personnel. The staff noted to HEUMF personnel that implementation of the limit into formal procedures and/or training may be warranted.
- **Lack of Sub-tier Vendor Quality Assurance Program Documentation:** Regarding the overloaded bolt issue noted above, B&W has not received documentation for the Quality Assurance program used by sub-tier vendors for the fastener components. Investigation by B&W continues.
- **Concrete Placement Deficiencies:** Deficiencies (lack of consolidation) with concrete placements in the loading dock and in other localized areas are being evaluated by B&W. A path forward for remediation of the deficiencies is to be determined in the next few weeks.