

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

TO: Steven Stokes, Technical Director  
FROM: William Linzau and Rory Rauch, Site Representatives  
SUBJECT: Oak Ridge Activity Report for Week Ending January 31, 2014

Staff members D. Campbell, R. Eul and J. Pasko were at Y-12 to evaluate conduct of operations and work planning and control performance.

**Nuclear Criticality Safety (NCS):** Last month, Production management suspended uranium briquetting operations after NCS engineers identified that briquettes may be retaining quantities of a hydrogenous material that had not been analyzed in applicable criticality safety evaluations (CSEs, see 12/13/13 report). To address this unanalyzed condition, NCS engineers are implementing a new control that requires operators in Building 9212 to measure the density of the briquettes prior to placing them in a storage container. If the bulk density of the briquette is lower than a set value, then it is classified as a “wet” briquette and a more limiting storage configuration is required. Briquettes found to be above the defined density will be restricted to a revised “dry” container loading limit. These changes were approved this week and briquetting operations resumed shortly thereafter.

While evaluating the possible sources of this unanalyzed material, NCS engineers also questioned if the amount of machining coolant adhered to uranium chips introduced more moderator than previously assumed in applicable CSEs. To address this concern, NCS engineers wrote a technical deviation document to lower the mass of uranium chips allowed in a chip dolly cylinder. The coolant is made of several constituents and engineers also lowered the limit on the amount of a specific additive that has a higher ability to moderate. One additional solution currently being evaluated by B&W management would involve cleaning the chips to remove this hydrogenous material prior to briquetting.

**Freeze Protection Program:** Earlier this month, the Y-12 site experienced freezing conditions that caused damage to several systems and required B&W to take a significant number of proactive measures to protect equipment from freeze-related damage (see 1/10/14 report). The week following the event, B&W senior management held a meeting to identify opportunities to further improve Y-12’s freeze protection program. One of the preliminary actions identified during the meeting was to improve the fidelity of some of the remote temperature monitoring equipment. The infrared sensors in some locations were reading the temperature of the air in open space, but the actual temperature of the equipment was considerably colder. This was particularly problematic for equipment located near exterior walls and ceilings. B&W is working to adjust these sensors as well as pursuing other improvement actions, including: developing a list of sprinkler systems known to have higher risk of freezing, insulating portions of buildings that are susceptible to freezing, using heat tape where allowed by code, installing audible/visible alarms on water collection points (drip drums) in dry pipe fire suppression systems, and ensuring heaters can maintain required minimum temperatures in vulnerable areas.

B&W has completed repairs to equipment damaged during the freeze with the exception of a few non-critical components. During the last two weeks, temperatures have dropped below 10° F on several occasions and no additional piping systems have experienced damage.

**Building 9212:** A small amount of special nuclear material was unknowingly transported out of Building 9212 through an unintended exit point, but was detected prior to leaving the protected area. B&W suspended the use of this type of exit point for outgoing material transfers and established a set of corrective actions that must be completed before resuming related activities.