

## **DEFENSE NUCLEAR FACILITIES SAFETY BOARD**

**MEMO TO:** Timothy Dwyer, Technical Director  
**FROM:** Matthew Duncan and Rory Rauch, Pantex Site Representatives  
**SUBJECT:** Pantex Plant Report for Week Ending June 25, 2010

**DNFSB Activity:** J. Anderson and W. Von Holle were at Pantex to observe the first week of the B53 SS-21 Nuclear Explosive Safety Study.

**High Pressure Fire Loop (HPFL):** There was a significant external rupture of the lead-in piping to a high explosive machining facility. As designed, both diesel pumps started automatically. The operations center directed all plant personnel to stop work and place all operations in a safe and stable configuration. Within approximately 20 minutes, the affected piping had been isolated by fire department personnel. Work across the plant resumed within an hour. This is the 24<sup>th</sup> corrosion-induced leak since 1995. The ongoing HPFL upgrade project is replacing deteriorating ductile-iron piping of the main loop, but funding for facility lead-ins remains unavailable.

**Conduct of Operations:** The vacuum chamber and manifold facility is used for leak checking of nuclear explosives and components as well as for temporary staging. This week, a technician inadvertently filled a nuclear explosive with the incorrect tracer gas composition. Technicians then placed the unit into the vacuum chamber and performed the leak test. Later, when the tracer gas was purged from the unit, technicians took a sample of the gas to confirm the validity of the leak test. A process engineer reviewed the sample results and discovered the error. B&W critiqued the event and is planning to perform a causal analysis to assess what happened and propose enhancements to the process and procedures to prevent recurrence.

**Electromagnetic Safety:** The nuclear security enterprise electromagnetic committee met this week to discuss several unresolved lightning safety issues. Lightning subject matter experts (SMEs) from Lawrence Livermore National Laboratory have demonstrated that the W62 and W80 warheads screen from the hazard posed by the interactions between the weapon detonator cable assemblies (DCAs) and the time-varying electromagnetic fields generated in a facility following a design basis lightning strike (i.e., indirect effects). The committee has now demonstrated that all weapon programs screen from indirect effects and will issue a memo in the coming weeks to formally document closure of the issue. It should be noted that the aforementioned analyses only considered the effect of the electromagnetic fields on the DCAs in isolation. The committee will add co-located equipment and tooling to the analysis as part of its efforts to evaluate the hazard posed by potentially multi-point grounded weapon configurations.

As part of the committee's effort to disposition the postulated bond wire inductance hazard, the Pantex lightning SMEs completed documentation of the new method for verifying intrinsic bonding of facility penetrations to the Faraday cage (see 4/30/10 report) and formally presented the methodology to the committee. All lightning SMEs on the committee verbally concurred that the methodology was reliable enough for use in nuclear safety applications. B&W anticipates testing penetrations at a rate of approximately one facility per month due to constraints in crafts, SME, and facility availability.