

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 31, 2017

**MEMO TO:** Steven Stokes, Technical Director  
**FROM:** Ramsey Arnold and Zachery Beauvais  
**SUBJECT:** Pantex Plant Report for Week Ending March 31, 2017

**DNFSB Staff Activity:** J. Deplitch observed the ongoing W76 nuclear explosive safety study.

**Neutron Detection Equipment:** During process development for the upcoming Warhead Measurement Campaign, CNS safety analysis engineering (SAE) personnel identified potential hazards associated with tubes containing pressurized  $^3\text{He}$ , located within various neutron detection equipment, including those currently used for radiation safety and material control and accountability surveys. Based on a preliminary review of the manufacturers' data, neutron detection equipment used at Pantex contain  $^3\text{He}$  tubes with pressures ranging from 2 to 20 atmospheres, presenting the potential for fragmentation and mechanical insults to units during accident scenarios. Supplemental equipment hazard analyses, performed prior to authorizing the use of radiation detection equipment in nuclear explosive areas, incorrectly dispositioned these pressure hazards. SAE determined that the discovery represents a potential inadequacy of the safety analysis (PISA), and has controlled the use of the affected detectors.

**Predictive Maintenance (PdM):** Facility engineering personnel performed the first vibrational measurements on diesel pumps supporting the safety-class high pressure fire loop (HPFL), as part of a newly established PdM program. The measurements were performed per a recently developed work instruction that specifies requirements and guidance for PdM on that system. Facility engineering plans to perform such measurements and provide tracking and trending of the collected data on a quarterly basis. Similar analysis will be performed for equipment in the high explosive pressing facility. In a November 2015 letter, the Board communicated the absence of a PdM program as a deficiency in the Pantex maintenance program.

**Safety Basis:** CNS upgraded a recent PISA to a positive unreviewed safety question (USQ) due to the hazard presented by a tripping production technician (PT) carrying task exhaust not being analyzed and a separate control not being implemented (see 3/24/17 report). Of the six PISAs declared in March, two were determined to be positive USQs, three were negative USQs, and one awaits further dispositioning. Additionally, NPO approved a justification for continued operations (JCO) last week to address the positive USQ identified last month related to the HPFL pump house temperature (see 2/24/17 report). Compensatory measures include ensuring the HPFL pump house temperatures are at or above 40°F with the use of a temperature sensor system and ensuring that the diesel engine coolant temperature is at or above 95°F with the use of a calibrated device. As part of the JCO implementation, CNS revised a 2015 standing order to improve its clarity and introduce required action statements for responders if a power failure or low temperature indicator signal is received (see 1/13/17 report).

**Cracked High Explosives:** Last week, PTs paused operations in a nuclear explosive cell when they discovered a cracked energetic component on a particular unit. Personnel responded appropriately and placed the unit in a safe and stable configuration. CNS has requested weapon response information from the design agency and is developing a nuclear explosive engineering procedure to continue processing the unit. Additionally, a nuclear explosive safety change evaluation will be executed prior to resuming operations.