

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 6, 2020

TO: Christopher J. Roscetti, Technical Director
FROM: Zachery S. Beauvais and Miranda McCoy, Resident Inspectors.
Peter J. Foster, Acting Resident Inspector
SUBJECT: Pantex Plant Activity Report for Week Ending March 6, 2020

DNFSB Staff Activity: J. Anderson observed and evaluated the first week of an operational safety review. Z. Beauvais concluded his assignment as a Pantex resident inspector.

High Pressure Fire Loop (HPFL): This week, a subcontractor responsible for performing upgrades to the safety class HPFL provided a third party test report to CNS documenting less-than-expected strengths for high density polyethylene (HDPE) butt fusion welds. These upgrades are part of a multi-year effort that Pantex has undertaken to renovate the HPFL infrastructure, including replacing ductile iron piping, which has proven susceptible to corrosion, with HDPE piping. The test report documented tensile testing performed by the manufacturer of the welding equipment, and was focused on the welds associated with one contract. The tensile testing demonstrated the majority of weld strengths were between 40-60% of the unaltered pipe strength, and high variance in weld strength around the pipe circumference. CNS held a fact finding to investigate the approximately two dozen butt fusion welds completed within the scope of the contract; however, CNS engineering personnel noted that the same welding method was used in previous contracts, potentially extending the number of affected butt fusion welds to several hundred across the plant. Fact finding participants noted that the sections of pipe currently in question passed the code-required pressure testing, and could not identify any requirement associated with weld-to-pipe relative tensile strength. However, the equipment manufacturer relayed that they typically see values in excess of 70%. The resident inspectors note that a number of premature failures and quality assurance concerns have affected newly installed HPFL upgrades performed by multiple subcontractors, including the subcontractor that performed the HDPE butt fusion welds (see 11/8/19, 5/17/19, and 7/7/17 reports). Of particular note, a separate HDPE joint mechanism, electrofusion coupling, experienced early-life failures as a result of improper installation (see 5/26/17 report). CNS intends to complete an extent of condition review and an operability evaluation of the system.

Electrical Distribution: Engineering personnel performed a series of troubleshooting activities on distribution equipment affected by a previous onsite electrical interruption (see 1/24/20 report). After testing the affected cabling and circuit protection, power was slowly restored to the isolated components. Once power was restored to the recently installed Zone 11 interconnect, CNS utility personnel heard a possible internal fault in distribution equipment and re-isolated the equipment. Preliminary analysis by the equipment vendor found a faulted electrical lead on a potential transformer used for control, and evidence of multiple short-circuit events. The resident inspectors were able to observe a significant portion of the cable testing and noted a thorough and methodical approach to troubleshooting. The affected equipment remains electrically isolated and CNS engineering personnel are working with the equipment vendor to determine the repairs necessary to restore the interconnect to operability. This is not the first instance of problems in newly installed electrical equipment and the plant will continue operating without the increased electrical reliability the interconnect provides for the near future.