

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 3, 2023

TO: Katherine R. Herrera, Acting Technical Director
FROM: C. Berg, Acting Resident Inspector
SUBJECT: Pantex Plant Activity Report for Week Ending February 3, 2023

Staff Activity: J. Anderson and C. Berg attended the W80-4 nuclear explosive safety (NES) preliminary design review at Lawrence Livermore National Laboratory.

Co-located Unit Operations: The assembly/disassembly of nuclear explosives with a conventional high explosive main charge are currently performed with only one unit in the bay or cell. This approach prevents an accident on the unit from initiating an additional, and possibly more severe, accident on a second unit. In its July 2022 letter, the Board noted concerns with a proposed operational change for a specific weapon program that would allow conducting assembly/disassembly operations on a nuclear explosive—with conventional high explosives—while a fully assembled nuclear weapon of the same type is staged in its handling gear in the same nuclear explosive bay. NNSA and CNS indicated that the proposal could enhance production efficiency, primarily from gaining flexibility to move the fully assembled unit into or out of the bay at a more opportune time (e.g., when not impacted by a lightning warning).

Late last year, a NES study group conducted a NES change evaluation for the same weapon program, assessing the safety of transporting the fully assembled unit within its handling gear in Zone 12 ramps and corridors during lightning warnings (see 12/16/22 and 12/23/22 reports). The study group endorsed the transportation activity, stating the NES standards remain satisfied. Subsequently, NPO questioned whether the above co-located unit operations were necessary given the authorization to move during lightning warnings and the resulting gain in production efficiency. In response, CNS re-evaluated the proposed operational change and recommended that it not be pursued at the current time.

Fire Protection: For nuclear material bays, the safety class facility structure is credited as a design feature to prevent an external fire from progressing to an internal fire. Specifically, the facility exterior walls, roof, and doors must withstand a two-hour external fire. In addition, fire penetration seals are used when facility equipment—such as piping—must breach the fire barrier. This week, while performing an in-service inspection within a nuclear material bay, CNS Facility Engineering identified a degraded fire penetration seal within the facility wall and determined that the crack in the seal exceeded operability limits defined in an engineering evaluation. As a result, CNS declared the penetration seal degraded and established a compensatory measure to maintain a five-foot standoff from the entire wall inside the facility.

Safety Basis: Last month, CNS executed a single-use nuclear explosive engineering procedure (NEEP) that did not implement all appropriate controls. Prior to steps to install a component over an uncased high explosive configuration, the NEEP did not require application of special tooling that prevents a potential impact scenario to the configuration. CNS did evaluate the NEEP prior to its execution (i.e., during an Unreviewed Safety Question review) but did not identify this missing control. Of note, this event is related to a recent declaration of a potential inadequacy of the safety analysis (see 1/13/23 and 1/27/23 reports).