

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 14, 2024

TO: Timothy J. Dwyer, Technical Director
FROM: A. Holloway and C. Stott, Resident Inspectors
SUBJECT: Pantex Plant Activity Report for Week Ending June 14, 2024

Special Tooling: Last week, during nuclear explosive assembly operations on graveyard shift, CNS production technicians identified that one of the lead screw nuts had loosened on the in-use cell stand, causing the normally level trunnions to tilt and bind. The purpose of the lead screw nuts is to physically support the trunnions of the cell stand, which support and maintain control of the associated nuclear explosive during assembly and disassembly operations. Upon discovery, in accordance with standard practices, CNS technicians paused operations, called the required CNS organizations, and placed the unit in a safe and stable configuration based on information relayed during this phone call and field observations by those present at the time.

Later, when day shift personnel arrived and observed the condition, CNS concluded that additional measures were needed for a safe and stable configuration. These measures included returning the loose lead screw nut to its position against its associated lower trunnion as well as removing a certain weapon component suspended by tooling on the upper trunnions.

During the critique, since additional measures were required, PFO questioned the adequacy of the initial safe and stable determination via phone as opposed to in-person observation by all parties. PFO highlighted that in the initial safe and stable configuration, CNS implicitly credited the safety catches of the tool on the upper trunnions—which suspended a certain component over high explosives—even though the safety catches are not credited in the safety basis. CNS responded that—while the safety catches are not formally credited—the tool on the upper trunnions is credited to maintain positive control of supported components. The resident inspectors note that this credited tool relies on a non-credited system to maintain positive control.

While personnel were able to easily recreate this loosening of the lead screw nut on a different cell stand, CNS stated that they could continue utilizing other stand copies since they performed a finite element analysis and engineering evaluation to assert that the cell stand could maintain its safety function with the lead screw nut loosened and lower trunnions tilted. CNS stated that the engineering evaluation sufficiently accounts for the additional stresses applied to the uneven tool loading in the cell stand. At the time of the critique, CNS had not published the finite element analysis or the engineering evaluation. PFO indicated that the engineering evaluation would not bound the maximum weights experienced during normal use. Furthermore, PFO informed CNS of an issue for a previous cell stand revision where the engineering evaluation did not reach the same conclusion.

After this discussion, CNS Tooling and Tester Engineering declared a stop work event, prohibiting CNS from performing operations utilizing any copy of the associated cell stand until CNS can implement a solution to address loosening lead screw nuts. Furthermore, CNS discussed plans to develop a procedure to remove the material of concern from this cell stand, along with a potential to incorporate a higher strength threadlock material on the lead screw nuts to preclude similar loosening of the lead screw nuts.