

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 10, 2015

**MEMO TO:** Steven Stokes, Technical Director  
**FROM:** Zachery Beauvais, Acting Pantex Site Representative  
**SUBJECT:** Pantex Plant Report for Week Ending July 10, 2015

**Isolator Electrostatic Discharge (ESD) Hazards:** On June 19, 2015, Consolidated Nuclear Security, LLC (CNS) declared a Potential Inadequacy of the Safety Analysis on two separate weapon programs when a vulnerability to a potential ESD hazard was discovered in a common electrical isolator that contains explosive material (see 6/26/15 report). The design agency responsible for the nuclear explosive transmitted an information engineering release (IER) stating that the potential consequences from an ESD insult to the affected isolator could result in high order consequences. On June 30, 2015, CNS determined that the concern resulted in a positive unreviewed safety question for disassembly and inspection (D&I) operations but does not adversely affect the safety of assembly operations. CNS developed a justification for continued operation (JCO) for D&I operations. The current D&I process utilizes a shorting plug and outlet cap plug to electrically isolate the isolator when it is removed from the unit. The JCO states that certain issues of the shorting plug do not provide sufficient ESD protection alone; thus, it requires the use of a connector cover to provide additional ESD margin. The JCO also requires that production technicians (PTs) remain electrically bonded to the unit during isolator removal and installation of the outlet cap plug. The NNSA Production Office (NPO) approved the JCO on July 9, 2015. The acting site representative observed a Nuclear Explosive Safety (NES) Change Evaluation (NCE) performed on July 8, 2015, to evaluate the potential vulnerability of the isolator to ESD hazards for one of the affected programs. The NES Study Group (NESSG) concluded that the operations do not violate the NES standards and communicated two deliberation topics (DT) on hazards related to electrically testing the isolators. In an IER, a design agency requested that CNS not perform electrical tests on the isolator during nuclear explosive operations. The revised procedure for D&I operations removed the test while the isolator is connected to the unit but did not specifically preclude bench testing in the nuclear explosive area. Additionally, a design drawing still required PTs to perform the resistance test while the isolator is on the unit. In their DTs, the NESSG stated that CNS corrected the procedure to disallow bench tests, and the design agency process engineer committed to revise the drawing. The NESSG also noted that isolator testing may present an explosive safety concern wherever it is performed.

**Mechanical Impact Scenario Tooling Analysis:** CNS performed a tooling analysis to determine whether protective caps installed to protect the detonator cable assembly (DCA) from ESD insults would adequately mitigate mechanical insults to below threshold values. NPO directed CNS to complete this as part of the implementation process for the JCO developed in response to a recent DCA removal issue (see 6/19/15, 6/12/15 and 2/13/15 reports). Specifically, force transfer through the material required for adhesion and ESD dissipation of the cap was not previously considered in the mechanical insult analysis. During the tooling analysis, CNS could not demonstrate that the cap complied with functional requirements for protection against impact scenarios and subsequently paused the specific operation. On July 2, 2015, CNS submitted an updated JCO to NPO for approval. The JCO concludes that procedures and training ensure that PTs apply the adhesive material to the underside of the cap in a manner that ensures a “sufficient amount of material is not present” and that an air gap is present between the cap and the DCA to mitigate mechanical loads. At the time of this report, NPO had not approved the JCO.