

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

**MEMO TO:** Timothy J. Dwyer, Technical Director  
**FROM:** Matthew Duncan and Rory Rauch, Pantex Site Representatives  
**SUBJECT:** Pantex Plant Report for Week Ending October 23, 2009

**DNFSB Staff Activity:** B. Laake was onsite to observe the Nuclear Security Enterprise Electromagnetic Committee (NSEEMC) meeting. Outside expert F. Lenning was onsite to discuss lightning safety with the NSEEMC.

**Electromagnetic Safety:** The NSEEMC met this week to discuss electrostatic discharge (ESD) and lightning safety issues. The methods used by B&W and the design agencies to characterize the unmitigated ESD environments for different weapon programs continue to vary. The latest variation resulted from the work performed by B&W and Los Alamos National Laboratory to characterize the unmitigated ESD environment in support of the hazard analysis for the B53 SS-21 process. Relative to its predecessors, the B53 unmitigated ESD environment includes more detailed circuit diagrams and is governed by more conservative assumptions. The committee has yet to determine whether these additions need to be backfit to previous analyses.

B&W indicated that the lack of a consensus methodology for characterizing unmitigated ESD environments has made performing the unmitigated hazard analysis unnecessarily laborious. B&W, in an effort to focus more resources on the development of engineered controls instead of additional analysis, has proposed a nuclear safety research and development initiative to study the use of air ionizers. The addition of this engineered feature would allow for the development of a more conservative unmitigated hazard analysis, which should satisfy more technical stakeholders with a less complex analysis and in turn reduce the analyst's burden.

The NSEEMC continues to make little progress towards closing open lightning safety issues. The committee's path forward to resolve the bond wire inductance issue involves the verification of intrinsic bonding of facility penetrations to the Faraday cage. However, neither proposed methodology for intrinsic bond verification—time-domain reflectometry (TDR) or inductive current transformer technology—has been approved for use by the committee. TDR was once thought to be a fully vetted methodology, but emerging concerns related to the potential for subtleties in facility geometries to lead to false positives have caused the committee to revisit TDR's development and implementation. Regarding indirect lightning effects, Lawrence Livermore National Laboratory (LLNL) evaluated whether field enhancements from specific tooling configurations would exceed previously bounding cases. Though the new configurations were found not to be bounding, LLNL is now further delayed in meeting its commitments. LLNL is now scheduled to provide weapon response for indirect lightning effects in January.

**W76-1 Operations:** B&W submitted a revised justification for continued operations to PXSO to recover from the recent W76-1 high explosive separation event (see 8/28/09 and 10/2/09 reports). Along with minor tooling changes, the proposed process has been modified to remove the pit, package it, and move it to another area prior to performing operations with scenarios where high explosive components could impact nylon surfaces. The pit and main charge high explosives would no longer be collocated. Since a nuclear explosive would no longer be present, B&W's Applied Technology division can provide the weapon response instead of Los Alamos National Laboratory. The nuclear explosive safety change evaluation is scheduled to restart next week.