

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy J. Dwyer, Technical Director
FROM: Timothy Hunt and Rory Rauch, Pantex Site Representatives
DATE: 03 April 2009
SUBJECT: Pantex Plant Weekly Report

Lightning Protection: The August 2000 nuclear explosive safety (NES) master study of the lightning protection system at Pantex identified a post-start finding concerning the lack of understanding of the effects of lightning-induced concrete spalling. Last December, the Nuclear Weapon Complex Electromagnetic Committee (NWCEMC) issued a memo recommending closure of this finding. Sandia National Laboratories had performed analytical and empirical work to determine that a voltage at least twice the maximum anticipated facility voltage was needed to initiate spalling in a Pantex facility. Therefore, the NWCEMC concluded that spalling is unlikely or impossible in Pantex nuclear explosive areas. This week, the NES division concurred that the work done by the NWCEMC was sufficient to close this finding.

Deluge Fire Suppression System Degradation: The ultra-violet (UV) detectors supporting the deluge fire suppression must receive an alignment inspection annually to ensure detection coverage of the facility operating area remains adequate. This week, during the annual alignment surveillance, maintenance personnel discovered a UV detector in a bay was shifted by approximately 1/8 inch from the alignment markings on its mounting plate. This misalignment translated to a detection zone on the floor that had moved approximately 7 feet from the intended target area. B&W Pantex subsequently declared a performance degradation of the deluge fire suppression system that prevented satisfactory performance of its design function when it was required to be operable. This is the first failed surveillance of a deluge fire suppression system detector alignment (UV or infra-red) since the surveillance requirement was first implemented approximately six years ago. Fire protection engineering is trying to determine the reason for the misalignment. To better understand the margin of fire detection coverage associated with the detector alignment, fire protection engineering plans to analyze the change in fire detection coverage when a detector is missing or misaligned by varying degrees.

Derived Weapon Response: Limitations on design agency (DA) resources occasionally compel B&W Pantex to derive weapon response rules to facilitate timely approval of an operational startup or restart. This practice involves applying the weapon response rules that have been formally issued by the DA for one weapon program to the accident scenarios that have been postulated for operations on a different program. The derivation is performed by authorization basis personnel and no DA input or approval is required. The need for formal DA input on the derived weapon response is then captured as a planned improvement in the DSA.

A staff review showed that these derivations are performed in a reasonably conservative manner. Actual weapon response for one weapon program is only applied to a new program if the two programs are supported by the same design agency, the component in the scenario is identical (e.g., same high explosive) or judged to be sufficiently similar (e.g., canned sub-assembly), the configurations of the units are similar, and the environment parameters in the actual weapon response are the same or bounding for the scenario to which they are being applied. There is no indication that weapon response has ever been derived for electrical events involving detonator configurations. The number of outstanding derived weapon responses has decreased from more than 100 to less than 20 as the rate of SS-21 startups has slowed in the last 18 months.