Weekly Site Reps Reports — Pantex

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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending August 27, 2010

Electrostatic Discharge (ESD) Controls: B&W has installed the new ESD footwear checker (see 4/2/10 report) at the entrance to one nuclear explosive cell. This week, a production section manager noticed that the barrier plate of the checker had been bent away from the badge reader to allow an individual to use the reader without performing the intended electrical resistance measurement. No nuclear material was present in the facility at the time of the discovery and no work had been performed in the facility between the time when the reader was last observed to be in an acceptable condition and the discovery of this damaged condition. Manufacturing personnel believe a security police officer (SPO) bypassed the reader in order to perform the daily check that the facility is properly secured. This operation requires a SPO, who does not don ESD footwear and thus cannot lower the plate in front of the badge reader, to use the badge reader without entering the facility. System engineering plans to modify the footwear checker to accommodate this verification.

Facility management personnel performed an extent of condition review for the missed in service inspection for an ESD floor covering (see 8/13/10 report) and found one additional floor with the same problem. This time, there was no potential inadequacy of the safety analysis as the facility did not contain a nuclear explosive.

Plutonium Contamination: For the last several months, radiation safety technicians have been surveying legacy components in preparation to transport the components to Sandia National Laboratories for processing. This week, after surveying the outside of a black bag marked only with "caution: radioactive material" and finding no contamination, the technicians carefully slit open the bag and found 63,000 dpm/100 cm^2 alpha (removable, the total contamination readings are still in question). They also found 950 dpm/100 cm^2 alpha (removable) on the polybag that had been placed under the black bag. The technicians immediately double-bagged the component and affixed the proper label to the black bag. Personnel contamination surveys and nasal smears were performed on the technicians and no contamination was found. Radiation safety department management has issued direction to its technicians that any unmarked or improperly labeled legacy components discovered during this initiative shall be set aside for processing at a later date. This work will take place in a contamination area and will likely require the technicians to wear respirators, along with other additional personal protective equipment. After further investigation, radiation safety has determined there are approximately four of these plutonium-contaminated legacy components remaining elsewhere onsite.

Material Moves: During the last several weeks, the B&W emergency management department had been performing a work-for-others activity that required the transportation department to move a weapon trainer unit (with trackable quantities of depleted uranium) to a unique location onsite. Because this location had not been established in the electronic Pantex Material Move System, the operations center had to manually approve the move—a mechanism that is allowed by the Pantex authorization basis, but is not detailed in the B&W procedure for authorizing material moves. B&W recognizes this procedural gap and plans to provide guidance on the process that should be followed to authorize material moves for activities in unique locations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending August 20, 2010

Lightning Safety: In a letters to DOE dated June 22, 2001, the Board communicated concerns about unanalyzed hazards that could result from a lightning strike to a nuclear explosive facility. Specifically, the Board identified the possibility that resultant electromagnetic fields could induce electrical currents in sensitive components through indirect energy transfer mechanisms. In a letter dated March 30, 2007, following several years in which experts focused their efforts on understanding and protecting against direct energy transfer mechanisms, the Board reiterated its concern and stated that considerable uncertainty remained regarding the magnitude of this potential indirect lightning threat. For the past three years, the nuclear security enterprise electromagnetic committee (NSEEMC) has placed considerable effort toward understanding the magnitude of this threat by refining its model of the electromagnetic environment generated in a nuclear facility following the design basis lightning strike and calculating the response of the detonator cable assemblies (DCAs) for each weapon program to this environment. Recently, the design agency representatives from the NSEEMC completed the work to conclude that the DCAs in free space (i.e., absent of any coupling effects from tooling) for all weapon programs screen from the electromagnetic environment generated by the design basis lightning strike.

The NSEEMC considers the work to characterize the indirect lightning threat to DCAs in free space complete; however, the committee must now extend its analysis to cover weapon tooling and other equipment. The committee is drafting the implementation plan for this effort, which could take several years to complete.

Issues Management: Pantex utilizes a Corrective Action Review Team (CART) to enhance the quality, continuity, and consistency of its issues management process. The CART consists of volunteers from the pool of qualified causal analysis facilitators, personnel from the quality and performance assurance department, and a PXSO representative (who participates in an oversight capacity). The team reviews randomly selected quality, safety, and security issues and evaluates these issues for timeliness of identification, adequacy of the extent of condition, quality and appropriateness of the causal analysis, and effectiveness of corrective actions. The CART's goal is to review approximately 250 issues (20 percent of all issues tracked by the Issues Management department) each year. The results of the CART review are provided to the issue owner and the issues management point-of-contact for the affected division(s). However, the CART, which is chartered by standing order, is not currently empowered to re-open issues if significant problems with the execution of the issues management process are found. B&W management plans to transfer the CART charter from the standing order to a work instruction, at which time the CART's authority would be expanded to allow the team to re-open issues when necessary.

Conduct of Operations: Recently, W76 technicians were unable to pass the required vacuum decay rate on a lifting fixture in preparation for a pit removal operation. Upon removing the fixture and inspecting the assembly, they noticed that the technicians from the previous (grave) shift had left pieces of cleaning tissue on the pit. The technicians judged these particulates to be the cause of the failed vacuum decay tests and appropriately suspended operations. Process engineering developed a recovery procedure that directed the technicians to re-clean the pit. Technicians successfully executed the recovery procedure and the remainder of the disassembly. Manufacturing management briefed the responsible technicians on the need to verify the absence of excess material following cleaning operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending August 13, 2010

DNFSB Activity: B. Rosen observed the final week of the W84 SS-21 readiness assessment.

Electrostatic Discharge (ESD) Floor Covering: ESD floor coverings are technical safety requirement (TSR) design features and are required to provide a dissipative path to ground. The TSRs include an annual verification that floors measure between 100 kilohms and 100 megohms to facility ground. B&W did not perform this in service inspection (ISI) within the required periodicity for a bay, which appears to have been caused by a mistake by the facility manager as he had incorrectly updated his status board in April to reflect that the ISI had been completed. B&W declared that a potential inadequacy of the safety analysis exists as the facility in question has a partially disassembled nuclear explosive in the work stand which prevents B&W from testing the ESD floor. B&W performed an engineering evaluation which evaluated the historical performance of ESD floors at Pantex and noted that the oldest one was installed in 2005, none has ever failed an annual ISI, and that their electrical properties appear to be very stable. B&W is determining whether this is an unreviewed safety question and will write an evaluation of the safety of the situation which will serve as the basis to resume disassembly of the nuclear explosive.

Lightning Safety: B&W will be limited to one operational mass properties facility for an indefinite period of time as a result of the damage caused by the flooding event of July 8. To enhance the efficiency of the remaining facility, B&W management asked the lightning subject matter experts on the nuclear security enterprise electromagnetic committee to evaluate the risks associated with installing or removing a nuclear explosive from the mass properties dynamic balancer during lightning warnings, an operation that is currently prohibited by the documented safety analysis. The committee identified several loops created by process tooling that could provide a conduit for lightning energy to couple with the weapon through indirect energy transfer mechanisms. The committee determined the hazard associated with these loops must be further characterized before the subject operational restriction is removed. The B&W members on the committee will identify the bounding loop, characterize the energy transfer mechanism to the weapon, and provide this environment to the design agencies for weapon response.

B53 Nuclear Explosive Safety (NES) Study: The coordination copy of the study's report contained one pre-start finding concerning the structural integrity of a weapon component made out a phenolic resin. The process, as currently designed, relies on this component as part of the load path when removing a large part (containing the main charge high explosives) from the bomb's case. The report's finding notes that there are no process features (such as tooling or inspections) incorporated to remove complete reliance on the component, and that there is a lack of surveillance data to ensure the structural integrity of the component. In addition, the report discussed how B&W has no predefined contingency in place to handle a failed or degraded component. Although B&W and the design agency believe it is unlikely that the components have experienced any significant aging effects, B&W plans to modify the process to add a sling to provide defense in depth in case the weapon component fails under load.

There are some partially disassembled B53s at Pantex that are currently staged in the configuration that is of concern to the NES study group. To address this issue, PXSO will not authorize B&W to transport and ultimately dismantle these units until B&W has had a chance to gather sufficient data on the components during initial B53 dismantlements.

W62 Operations: B&W completed the W62 dismantlement campaign this week, approximately one year ahead of schedule.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending August 6, 2010

DNFSB Activity: C. Martin was onsite to observe the first week of the W84 SS-21 readiness assessment.

Flooding Event: B&W has resumed operations in all nuclear and nuclear explosive facilities affected by the flooding event of July 8. Generally, the final facilities and operations to be restarted were either awaiting completion of more extensive tooling evaluations or PXSO approval of the latest revision to the evaluation of the situation. Facilities in the former group contained workstands that had been exposed to standing water during the flooding event. These workstands contained nuclear explosive configurations at levels of assembly that could not be transferred to unaffected workstands using the existing tool set. Therefore, tooling design personnel performed a detailed investigation to prove the workstands could meet applicable safety basis requirements for the remainder of their respective operations. Of specific concern was whether these workstands would maintain continuity with static dissipative flooring. Because crafts personnel cannot perform these measurements on workstands with nuclear explosive configurations, they tested the electrical continuity and functionality of a similar workstand from another location in the same block of bays. The representative workstand passed the continuity check by two orders of magnitude. In addition, process engineering developed a temporary procedure to allow the tooling design engineer to perform limited functional testing of the affected workstands. Ultimately, tooling design personnel concluded that these workstands will be fully functional and able to satisfy all credited design features.

Upon completion of the tooling evaluation and receipt of authorization to restart in one of the remaining facilities, technicians successfully executed the recovery procedure for the W80 unit that could not be disassembled using the conventional process (see 7/2/10 report).

Violation of a Specific Administrative Control (SAC): As reported last week, a security police officer violated a SAC when he drove on a road that had been closed to support open magazine operations in Zone 4. B&W convened a cause analysis meeting to discuss the reasons for the SAC violation. They also discussed why it took more than one hour for the violation to be reported to the appropriate personnel outside of the safeguards and security (S&S) division so that they could direct actions necessary to restore compliance with the control and to officially enter the generic limiting condition of operation (LCO). The standing order that implements the generic LCO requires that several actions be taken immediately upon the discovery that one of the applicable SACs may have been compromised. Upon its initial release, B&W limited the applicability of the standing order and excluded the S&S division. As a result, the standing order's requirements were never incorporated into S&S division orders and procedures, and the S&S personnel present at the cause analysis meeting were not familiar with them. This is the second time that both the individual that violated the SAC and his supervisor were not aware of the generic LCO and its requirements (see 4/23/10 report, severe weather program SAC) and the third time that B&W did not enter the generic LCO in a timely manner (see 5/14/10 report, crane use authorization SAC).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending July 30, 2010

Flooding Event: Representatives from the design agencies were onsite to understand the process B&W has been using to resume operations following the flooding event of July 8. B&W management presented documented evidence that the appropriate engineering disciplines evaluated and resolved any issues associated with the safety systems, tooling, testers, and nuclear or nuclear explosive configurations. Following a walkdown of select nuclear explosive facilities, the DA representatives, with some minor exceptions, informally indicated they were satisfied with the measures that B&W had taken prior to resuming operations.

B&W has resumed operations in most nuclear and nuclear explosive facilities that contained standing water in the operating area following the flooding event. Operations in the mass properties and vacuum chamber and manifold facilities cannot resume until the authorization basis department submits (and PXSO approves) an evaluation of the safety of the situation (ESS) that describes technical safety requirement-level compensatory measures needed for the newly analyzed performance category-3 flood event. PXSO expects to approve the ESS next week.

Violation of a Specific Administrative Control (SAC): The Pantex documented safety analysis credits several SACs to reduce the likelihood of vehicle impact events during the loading or unloading of nuclear explosives or nuclear explosive-like assemblies from Zone 4 magazines. One of these SACs requires road closure at the ends of the appropriate Zone 4 magazine access road prior to opening the magazine or transport trailer. A separate SAC prohibits anyone from driving on the roads that have been closed. There is an exception for security vehicles, which may travel on the unpaved areas on either side of the closed road.

This week, while a magazine's doors were open, a security police officer (SPO) drove nearby to check on other SPOs and ask whether they needed a break. In doing so, he drove on the closed road at least two times, which violated the SAC. As this SAC is now covered by the generic limiting condition of operation, the event was not a technical safety requirement violation, like it was when a similar event occurred November 12, 2008 (see 11/14/08 report). In that event, the SPO bypassed a closure sign that he thought was not valid. In this case, the SPO never saw the signs because was driving through open roads and unpaved areas between magazines. However, the SPO had been trained on the SAC, should have communicated via radio to ascertain the status of operations, and should have observed the lights on vehicles that indicated operations were in progress and the road had been closed. B&W held a critique for the event and will perform a casual analysis next week.

W84 Contractor Readiness Assessment (RA): B&W recently completed its RA to assess preparations for W84 disassembly and inspection operations using the new SS-21 process. There were 3 pre-start findings, 1 post-start finding, and 3 observations. One pre-start finding addressed 15 procedure issues, 4 of which prevented technicians from performing a step as written. All pre-start findings have since been closed and the post-start finding has an approved corrective action plan in place. The NNSA RA is scheduled to begin next week.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending July 23, 2010

Flooding Event: PXSO issued a safety evaluation report (SER) approving B&W's evaluation of the safety of the situation (ESS) resulting from the flooding event of July 8. The SER contained one condition of approval resulting from PXSO's conclusion that B&W did not demonstrate an acceptable risk for the combined lightning and performance category (PC)-3 rainfall event during manifold operations. PXSO directed B&W to revise the controls for manifold operation such that adequate protection is provided for the aforementioned scenario. B&W plans to suspend manifold operations during lightning warnings until they can develop an electrical isolation feature that can survive a PC-3 rainfall event.

Subsequent to the issuance of the SER, B&W determined that an assumption in an engineering evaluation referenced by the SER is incorrect. The evaluation assumed the mass properties equipment would not remain energized if inundated by water. However, following the flooding event, system engineering observed that the equipment, despite being inundated by water, remained energized. B&W will have to revise and reissue the ESS to describe this scenario and add a compensatory measure requiring personnel to ensure the mass properties equipment is de-energized before contacting an installed unit with tooling or equipment.

Facility management completed its evaluation of the extent of flooding for all facilities in the Zone 12 South material access area by July 9. This week, B&W resumed operations in all facilities in which these evaluation teams found no water or limited amounts of water. For each facility, a multi-disciplined team of engineers documented the evidence they used to affirm that the facility was safe to resume operations. B&W expects to resume operations in the remaining nuclear explosive facilities next week.

W87 Nuclear Explosive Safety (NES) Change Evaluation (NCE): Last week, NNSA convened an NCE to consider a design agency (DA) proposal for an additional electrical test on a W87 disassembly and inspection unit. In proposing this continuity test, the DA intends to eliminate a specific open circuit as the cause of a mechanical safe and arm detonator (MSAD) function test anomaly (see 6/11/10 report). According to the DA, testing the unit in this configuration preserves information that would be lost during disassembly. The NCE group determined the proposed test meets the NES standards; however, they did identify several diagnostic improvements that could be made to the MSAD function test.

B83 NES: As previously reported, B&W is developing a new process that incorporates significant tooling upgrades and a static dissipative environment. These changes require revision of the documented safety analysis, B&W and NNSA readiness assessments, and a NES study, which is scheduled to occur April 2011. An operational safety review (required every 5 years for non-expiring NES studies) for the current process is required by November 2010. B&W recently requested a 10-month extension (until NNSA can convene a NES study for the new process) and submitted a remediation plan as required by DOE M 452.2-2, *Nuclear Explosive Safety Evaluation Processes*. Six post-start findings from the November 2005 NES study remain open.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending July 16, 2010

DNFSB Activity: B. Laake was at Pantex to observe the third week of the B53 SS-21 Nuclear Explosive Safety Study. J. Anderson and D. Campbell were onsite to review a sampling of calculations that form the basis of the Pantex documented safety analysis.

Flooding Event: B&W determined that the potential inadequacy of the documented safety analysis declared in response to last week's flooding was a positive unreviewed safety question. B&W submitted an evaluation of the safety of the situation (ESS) to PXSO that referenced new rainfall analyses recently completed by a subcontractor working on the 10-year site-specific natural phenomena hazards update. These analyses determined that the maximum credible (defined as a frequency of 1 every 10,000 years) water depth in nuclear explosive facilities would be 12 inches as a result of approximately 18 inches of rainfall over a 24 hour period. The ESS evaluated three hazard scenarios for potential nuclear safety consequences, including nuclear criticality, electrical coupling from either AC power or lightning, and chemical effects. It concluded that the risk of continuing operations is acceptable and that no compensatory measures are necessary. B&W plans to submit a justification for continued operation within 30 days of PXSO's approval of the ESS. Ultimately, B&W will incorporate the new rainfall and flooding analyses along with the resulting hazard scenarios into the existing DSA.

Engineers continued to evaluate the condition of facilities; infrastructure; safety-related structures, systems, and components; nuclear explosives; and weapon-related materials. B&W has determined that flooding affected roughly half of the nuclear facilities. No nuclear explosives or nuclear explosive components came in direct contact with water, although some tritium reservoir containers and approximately 1000 pit containers were exposed.

B&W has prioritized restart of each nuclear facility based on operational requirements. For every facility proposed for restart, a management team will collect and review all documentation (including engineering evaluations) affirming that it is safe to resume operations. Once this team's review is complete, the package will be sent to the manufacturing division. The manager for nuclear facility operations will lead a team that will also review the package, ensure that all surveillance requirements and in-service inspections have not expired, and perform a final inspection of the facility. So far, B&W has restarted one nuclear explosive facility.

Tritiated Water Skin Contamination: During the flooding event, storm water contacted several tritium reservoir containers that had been sitting on the floor of a nuclear explosive bay. During cleanup and recovery activities, radiation safety personnel entered the bay and surveyed the empty containers. These containers contain foam, and the interior appeared to be dry. While awaiting survey results, the technicians were told it was acceptable to reseal the containers. While lifting a container, contaminated water that had pooled in the bottom of a container spilled onto a technician's lap and onto his leg through his coveralls. The technician contacted radiation safety personnel, who responded and took samples of the water from several containers, which ranged from 3000-8000 dpm/ml. According to Pantex's procedures, these levels would require personnel to be in the bioassay program and wear plastic coveralls, booties, and face shields if splashing is a hazard. Later that morning, a second technician spilled water onto his (regular) coveralls, but it did not reach his skin. Both technicians submitted bioassay samples, both of which were below detectable limits. B&W chose not to critique this event.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending July 9, 2010

Flood Event: B&W suspended operations and declared a potential inadequacy in the documented safety analysis (DSA) after heavy rainfall left up to one foot of standing water in certain ramps and as much as six inches of standing water in nuclear explosive facilities. The current analysis in the DSA concludes that flooding is not a potential event initiator because the "floor elevation of Pantex Plant production and staging operations building structures are above the 1×10^{-4} per year exceedance flood level." Technicians were immediately assigned to the cleanup effort and ensured all nuclear material and nuclear explosives were in a safe configuration once the water had receded sufficiently to enter the facility. B&W is preparing an evaluation of the safety of the situation (ESS), which will show that no compensatory measures are required because operations will not restart until the facility is completely dry and utilities has determined that all safety and support systems are functioning properly. The ESS will also show that the standing water does not compromise lightning standoff or present an electrical coupling concern. B&W will prepare a justification for continued operations because the 10 year update to the flood analysis, which was recently completed by a subcontractor but not incorporated into the DSA, will not be ready for several months.

Relevant subject matter experts (e.g., design agency and tooling representatives) will assess all tooling, nuclear material, and nuclear explosive configurations that contacted water for any safety or quality implications. Offsite input will be transmitted using the engineering authorization system, which will in turn be reviewed by nuclear explosive safety.

Contractor Assurance System (CAS) Assessment: In early May, B&W Technical Services Group (TSG) performed a corporate validation of the CAS for B&W Pantex. The validation review team determined the B&W Pantex CAS is compliant with relevant requirements and provides an effective and maturing system for identifying and resolving deficiencies and weaknesses. The team identified 2 noteworthy practices, 1 finding, and 23 opportunities for improvement. The finding involved the fact that there was no metric in place to track the effectiveness of actions implemented from lessons learned. Of additional note, the validation review team identified several entries in the issues management database that had somewhat shallow causal factors determinations and weak corrective actions identified. B&W TSG will perform a validation of the B&W Y-12 CAS the week of July 17.

Onsite Transportation: A qualified commercial vehicle driver was moving an empty Safeguard Transporter in the Vehicle Maintenance Facility when the trailer detached from vehicle, causing severe damage to the trailer landing gear. Prior to moving the trailer, the driver completed a pull test, but failed to visually verify the kingpin of the trailer was fully engaged with the fifth wheel of the vehicle. Drivers that perform onsite transportation of nuclear material make the same type of connection, but use a checklist to ensure that all required verifications are performed before the move is initiated. Notwithstanding this enhanced formality, the department responsible for nuclear material moves stood down operations following the event until the parties involved could gather all relevant facts. Subsequently, the maintenance division determined the detachment resulted from a "false latch" scenario where the teeth of the clamp grip the larger diameter portion of the trailer pin and can come undone from a series of vehicle turns once the driver begins the move. The only way to ensure that a false latch has not occurred is to visually inspect an indicator on the fifth wheel. This inspection is currently part of the checklist used to by drivers prior to nuclear material moves. There have been four trailer detachment events at Pantex in the last 25 years.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending July 2, 2010

DNFSB Activity: J. Anderson was at Pantex to observe the second week of the B53 SS-21 Nuclear Explosive Safety Study. R. Tontodonato was onsite to observe operations.

Contingency Glovebox: B&W wrote a letter to PXSO proposing to ensure the availability of a reliable glovebox with trained personnel for use in responding primarily to an event involving a breached pit. The glovebox could also be used to evaluate and disposition dropped or damaged pits without a breach, inspect pits with imperfections or other anomalies, or contain a breached canned subassembly. B&W has a mobile glovebox that had been designed and built in 1997 for this purpose but was never made operational. The design documents and drawings indicate it had been designed to the appropriate standards at the time, such as DOE Order 6430.1A, *General Design Criteria*; ERDA 76-21, *Nuclear Air Handling Handbook*; and AGS-1994-G001, *Guideline for Gloveboxes*. B&W proposed to certify the existing glovebox, establish a core response team that would receive plutonium handler training at another DOE site, develop glovebox test and maintenance procedures, and exercise all aspects of the use of the glovebox prior to declaring it ready for use. Details on how the glovebox would be covered by the documented safety analysis and what type of readiness assessment would be required have not yet been finalized. B&W's proposed completion date is the end of September 2011. PXSO is evaluating the proposal.

Formality of Operations: B&W has curtailed operations in the Special Nuclear Materials Component Requalification Facility (SNMCRF) to facilitate a technical quality review in response to the recent NNSA letter that expressed concern with the formality of SNMCRF operations (see 6/18/10 report). Representatives from B&W, Los Alamos National Laboratory, and Lawrence Livermore National Laboratory will perform a review to verify that the design definitions for SNMCRF's acceptance equipment and production processes are complete and properly implemented. The review team will evaluate each SNMCRF station individually. When the quality review team deems the station acceptable for restart, a second review team led by the deputy manufacturing division manager will evaluate the formality of operations at that station. As B&W restarts stations, PXSO has assigned a team to perform enhanced day to day oversight of SNMCRF operations with a focus on quality and conduct of operations. PXSO will determine whether it needs to perform its own independent assessment in the coming weeks.

Operational Suspension: Technicians suspended a W80 disassembly operation after they were unable to separate the main high explosive charges using the currently approved process. Process engineering and manufacturing personnel are developing several recovery options in parallel. The first recovery option, which program personnel selected because it was the simplest, involves the technicians attempting to achieve the separation by hand or using an approved implement (e.g., shimstocks, spatulas). Process engineering should have the necessary approvals for the recovery procedure that governs the first option by early next week. If this operation is unsuccessful, B&W will continue to pursue the other, more complicated recovery options.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending June 25, 2010

DNFSB Activity: J. Anderson and W. Von Holle were at Pantex to observe the first week of the B53 SS-21 Nuclear Explosive Safety Study.

High Pressure Fire Loop (HPFL): There was a significant external rupture of the lead-in piping to a high explosive machining facility. As designed, both diesel pumps started automatically. The operations center directed all plant personnel to stop work and place all operations in a safe and stable configuration. Within approximately 20 minutes, the affected piping had been isolated by fire department personnel. Work across the plant resumed within an hour. This is the 24th corrosion-induced leak since 1995. The ongoing HPFL upgrade project is replacing deteriorating ductile-iron piping of the main loop, but funding for facility lead-ins remains unavailable.

Conduct of Operations: The vacuum chamber and manifold facility is used for leak checking of nuclear explosives and components as well as for temporary staging. This week, a technician inadvertently filled a nuclear explosive with the incorrect tracer gas composition. Technicians then placed the unit into the vacuum chamber and performed the leak test. Later, when the tracer gas was purged from the unit, technicians took a sample of the gas to confirm the validity of the leak test. A process engineer reviewed the sample results and discovered the error. B&W critiqued the event and is planning to perform a causal analysis to assess what happened and propose enhancements to the process and procedures to prevent recurrence.

Electromagnetic Safety: The nuclear security enterprise electromagnetic committee met this week to discuss several unresolved lighting safety issues. Lightning subject matter experts (SMEs) from Lawrence Livermore National Laboratory have demonstrated that the W62 and W80 warheads screen from the hazard posed by the interactions between the weapon detonator cable assemblies (DCAs) and the time-varying electromagnetic fields generated in a facility following a design basis lightning strike (i.e., indirect effects). The committee has now demonstrated that all weapon programs screen from indirect effects and will issue a memo in the coming weeks to formally document closure of the issue. It should be noted that the aforementioned analyses only considered the effect of the electromagnetic fields on the DCAs in isolation. The committee will add co-located equipment and tooling to the analysis as part of its efforts to evaluate the hazard posed by potentially multi-point grounded weapon configurations.

As part of the committee's effort to disposition the postulated bond wire inductance hazard, the Pantex lightning SMEs completed documentation of the new method for verifying intrinsic bonding of facility penetrations to the Faraday cage (see 4/30/10 report) and formally presented the methodology to the committee. All lightning SMEs on the committee verbally concurred that the methodology was reliable enough for use in nuclear safety applications. B&W anticipates testing penetrations at a rate of approximately one facility per month due to constraints in crafts, SME, and facility availability.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending June 18, 2010

Technical Safety Requirement (TSR) Assessment: B&W recently submitted a change to the documented safety analysis (DSA) to correct approximately 50 errors associated with description and supporting analysis of the nuclear explosive cells facility structure, a design feature that provides 17 safety functions (e.g., Faraday cage, two hour fire barrier). The designated control owner found these errors while conducting an assessment as part of the site's program to re-evaluate the implementation of 20 percent of the TSRs each year. In general, the errors can be grouped into two categories: descriptions of the facility structure in the DSA that were inconsistent with control drawings and discussions in the hazard and accident analysis that were inconsistent with referenced engineering documents. The control owner noted that none of the identified inconsistencies exposed weaknesses in the ability of the control to perform its credited safety functions. While the volume of errors discovered during this assessment is a concern, it is positive that the scope of the assessment was broad enough to review and identify inconsistencies between the reference documentation and the DSA.

Procedure Adherence: A first line supervisor for the W62 program discovered that technicians had been inappropriately removing polyvinylchloride (PVC) gloves prior to a sequence of steps during mechanical operations. The technicians had been exchanging the PVC gloves for leather gloves, which they believed could not be mixed with any other form of hand protection. The procedure allowed the technicians to use leather gloves if desired, but required the PVC gloves during the subject sequence of steps—even under the leather gloves—to provide a barrier against depleted uranium contamination. Manufacturing management held refresher training for the technicians involved to remind them that the procedure will explicitly direct the donning and removal of required personal protective equipment in a specific step.

Nuclear Explosive Testers (NET) Storage: The nuclear explosive safety (NES) branch recently approved closure of a post-start finding from the Approved Equipment Program (AEP) NES Master Study that identified the lack of standardized requirements for the design of the dual locks that protect NET storage areas. The NES branch noted that the closure package presented by B&W only addressed the one example of potentially weak locks cited in the AEP NES Master Study report and that the fundamental issue still remains. However, they agreed that the remaining portion of this finding could be addressed outside the NES finding closure process.

Formality of Operations: The chief of NNSA's submarine launched ballistic missile branch of the nuclear weapons stockpile division recently wrote a letter to B&W and PXSO expressing concern with the formality of operations at the Special Nuclear Material Component Requalification Facility. The letter cited: (1) failure to identify an out-of-tolerance facility temperature prior to contact gauging, (2) failure to properly measure pit surface temperature during contact gauging, and (3) restart of an integrated pit fill station after review of microfocus x-ray data, but before review of qualification weld metallography data. The letter requested a formality of operations assessment and verification of corrective actions for the events cited.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending June 11, 2010

DNFSB Activity: R. Rosen was at Pantex to observe the fourth week of the W84 SS-21 Nuclear Explosive Safety Study.

Weapon Response Application: Last May, B&W requested weapon response from Los Alamos National Laboratory (LANL) after authorization basis (AB) personnel determined that they had made an assumption regarding the application of weapon response that was not within their jurisdiction. AB personnel had assumed the forces applied by a piece of special tooling to a specific W76-1 configuration would be localized; therefore, they determined that certain elements of the weapon response rule were not applicable. In February, B&W declared a potential inadequacy in the documented safety analysis (DSA) as it continued to wait for weapon response to address this unmitigated hazard scenario (see 1/29/10 report). Last week, LANL issued weapon response indicating the original assumptions made by B&W AB personnel were incorrect and increased the consequences of the unmitigated hazard scenario accordingly. The AB department declared a positive unreviewed safety question as a result of this change. B&W submitted the DSA change reflecting the new weapon response this week. Meanwhile, site management has determined that no compensatory measures are needed as the change in weapon response only affects the unmitigated hazard analysis; they still consider the control used during this part of the operation—special tooling that limits the force applied to the configuration—adequate to protect against the postulated hazard.

Procedure Adherence: The Office of Secure Transportation began an offsite shipment of approximately 4,000 lbs of insensitive high explosives without the B&W material handler removing the explosives from the inventory of the originating facility (i.e., dispatching the items from the facility to the trailer), as required by procedure. In preparation for shipment, B&W had staged the trailer, with its full complement of explosive cargo, in front of a Zone 4 magazine. Pantex Material Movement System (PMMS) personnel therefore added the explosive weight of the trailer to the explosive inventory of the magazine, a combined explosive inventory that was an order of magnitude below the magazine's limits. The responsible material handler did not realize she needed to remove the explosive contents of the trailer from the magazine's inventory prior to the initiation of the offsite shipment. This issue was discovered the day after the trailer departed when the material handler contacted PMMS personnel to complete the transaction. PMMS personnel removed the explosives from the magazine's inventory at that time. Transportation department management held refresher training this week on the proper conduct of offsite shipments of explosives.

Test Anomaly: A nuclear explosive did not respond as intended during a tester operation. Technicians immediately placed the unit in a safe configuration and contacted their supervisor. Subsequent investigation by tester design determined the tester was functioning properly. Program management is awaiting direction from the design agency before proceeding.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending June 4, 2010

Positive Unreviewed Safety Question (USQ): Last week, B&W declared a positive USQ as a result of the the severe weather warning event that exposed potentially conflicting technical safety requirements (see 4/23/10 report). This USQ determination was the first opportunity for the authorization basis (AB) department to develop an evaluation of the safety of the situation (ESS) using the enhanced content required by the new Pantex USQ procedure. In the ESS and attached USQ determination, AB department determined the documented safety analysis (DSA) should be changed to clarify the actions required to achieve a safe configuration when severe weather is encountered during operations at a loading dock. Specifically, the material handlers are now required to use the minimum adequate tie-downs to maintain control of the material while the transportation trailer is being moved to provide sufficient clearance to close the trailer doors. These actions are currently captured in a standing order until a full cause analysis has been completed. The ESS further states that there is no credit taken in the DSA for the use of tie-downs and recommends eliminating the control from the technical safety requirements. The AB department will submit the DSA change by the end of July.

Training: This week, B&W conducted conservative decision making training for a group of new production technicians (PTs), most of whom will support the W76 program. The primary goal of the training is to ensure that PTs understand the expected response to process anomalies. Specifically, PTs are trained to achieve a "safe and stable" configuration, stop work, and contact their supervisor. The training reinforced the attributes of high reliability organizations and the principles of conservative decision making by reviewing important lessons learned from several high consequence accidents (e.g., the space shuttle Columbia accident) and guiding the technicians through the desired response to several hypothetical process anomalies.

Special Tooling: The B61 program has had to stop work on several recent occasions because of issues with its workstand. Most of the issues involved a slipping or gradual tightening of the gears and drive chain for the trunnions. In one recent example, PTs stopped work after they heard a popping noise while raising the unit in the workstand. The PTs lowered the unit into a safe and stable configuration. Process engineering developed a recovery procedure that directed the PTs to transfer the unit to the workstand on the opposite side of the bay and continue disassembly. Tooling personnel investigated the incident and found one of the teeth on the lower gear was misaligned with the drive chain. Program management will use surplus surveillance funding to support an enhancement of the workstand to a simpler, more robust design that eliminates the drive chain mechanism in favor of a system of interfaced gears. The first new B61 workstands should be available by October.

Pit Surveillance: The fiscal year 2010 performance evaluation plan incentivizes B&W to qualify laser gas sampling operations in support of B61 pit surveillance. To that end, the special nuclear materials division recently completed the first set of laser gas sampling operations on B61 pits. Thus far, it appears the sampling and welding for each item has been adequate. B&W is awaiting a qualification engineering release from the design agency before resuming operations.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending May 28, 2010

DNFSB activity: C. Martin was at Pantex to observe the second week of the W84 SS-21 Nuclear Explosive Safety (NES) Study.

Emergency Management: Last week, Pantex had a no notice emergency management exercise. The scenario involved an explosion during high explosive synthesis operations. The simulated explosion killed the two technicians in the bay and injured one in an adjacent bay. In addition, it ruptured two nearby anhydrous ammonia cylinders, complicating the initial security and fire department response. From the vantage point of the incident scene, the exercise appeared to be designed and run adequately. The fire department successfully dealt with the situation at the scene by putting out the fires, searching the building, and rescuing the injured technician within about 45 minutes of the explosion. At the critique, the evaluators discussed various issues that they had observed. The most serious issue appeared to be coordination between security personnel and the incident commander as well as various communication issues.

Potential Inadequacy in the Documented Safety Analysis (PISA): While performing an unreviewed safety question determination on a change to a calculation, the evaluator noticed a discrepancy between the calculation and a surveillance requirement supporting the performance of the diesel pumps that feed the high pressure fire loop. B&W subsequently declared a PISA. The calculation demonstrates that the minimum fuel volume required to support operability of the diesel pumps is 72 gallons, a value that includes the 30 gallons of unusable fuel in the tank. The surveillance requirement indicates that the minimum fuel volume required to support operability of the diesel pumps is 42 gallons. B&W believes the volume specified in the surveillance requirement was intended to reflect the minimum required *usable* fuel volume. Authorization basis personnel plan to change the surveillance requirement to align with the calculation and explicitly state whether the fuel volume includes the unusable portion of the fuel. Meanwhile, B&W determined no compensatory measures are required in response to this PISA because the maintenance procedure for the subject surveillance requirement requires the technician to verify the fuel tank is a minimum one quarter full, a level that corresponds to a volume of 131 gallons.

Electrical Equipment Program: B&W conducted a for cause independent assessment of the category 1, 2, and 3 electrical equipment programs following several incidents involving failures of these programs during the last year (see 1/15/10, 12/11/09, and 4/24/09 reports). The assessment team concluded the programs are in compliance with the requirements of DOE O 452.2D, *Nuclear Explosive Safety* and DOE M 452.2, *Nuclear Explosive Safety Manual*. The assessment team identified three findings, four weaknesses, and three observations. One finding captured the fact that B&W has not formally documented its process for verifying that all equipment used in nuclear explosive areas has been specifically approved for that operation. The report stated that B&W is maintaining compliance with the electrical equipment program requirements in the absence of a fully documented process because the program is being run by knowledgeable and conscientious personnel. The report went on to state that continuing to rely on this dynamic would not be a sound long-term strategy. Of additional note, the assessment team observed a lack of ownership of the electrical equipment program by any single organization at the plant. The NES organization owned these processes several years ago, but now it is not clear whether these processes belong to the organizations performing the evaluations (system engineering or tester design), or those that would identify the need for an evaluation (process engineering, tooling, or quality acceptance).

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending May 21, 2010

DNFSB activity: C. Martin and R. Rosen were at Pantex to observe the second week of the W84 SS-21 Nuclear Explosive Safety (NES) Study. J. Anderson and outside expert L. McGrew were onsite to attend the kickoff meeting and training for the B53 SS-21 NES Study.

B61 Operations: As reported on 1/29/10, technicians suspended a B61 disassembly operation after they were unable to separate the pit from a high explosive charge. B&W designed a new tool that is capable of applying additional force to achieve the separation. Last week, a NES Change Evaluation Group determined that the new tool and process did not pose a threat to NES. This week, technicians successfully completed the operation.

Conduct of Maintenance: During a recent fire protection assessment, PXSO discovered a discrepancy in the work package that documented completion of the semi-annual surveillance of the deluge fire suppression system in the 12-44 cells. As part of the sensitivity testing of the deluge initiating device (in this case, an infra-red (IR) detector), the maintenance procedure requires crafts personnel to verify the reading in the detector self-check module is between 90-100 counts per second (cps). In the subject work package, crafts personnel recorded a value of 89 cps for 3 of the 12 detectors. The maintenance procedure contains a note that requires crafts personnel to clean the detector lens and repeat the test if the reading is not within the specified bounds. The individual that conducted this surveillance could not recall if he complied with the instructions in the note. Operability of the IR detector is actually defined by a range of 80-110 cps; therefore, fire protection engineering would have deemed the system operable had the discrepant reading been brought to their attention at the time the surveillance was performed.

Unreviewed Safety Question (USQ) Procedure: This week, PXSO approved a revision to the Pantex Plant USQ procedure. The primary purpose of the revision was to incorporate USQ program enhancements based on feedback from external assessments and to reflect the expectations promulgated in the new revision to DOE G 424.1-1B, *Implementation Guide for Use in Addressing Unreviewed Safety Question Requirements*. The most significant change involves the incorporation of explicit instructions on the format, content, and timing of the notification of an evaluation of the safety of the situation. Of additional note, per the implementation plan for the new Pantex USQ procedure, the authorization basis department will revise the Pantex-specific procedure for processing new information to ensure that B&W declares a potential inadequacy in the documented safety analysis (PISA) as soon as the new information has been verified as valid and applicable to the existing DSA. The previous version of this procedure, contrary to the guidance in DOE G 424.1-1B, allowed the USQ evaluator to skip the PISA declaration if enough information existed to perform the USQ determination.

NES Process Improvements: B&W has proposed to PXSO the implementation of NES "by design," a new process that would integrate the NES community into the development of a new or significantly revised nuclear explosive process at a time when changes can be made without a major rework effort. This Conceptual NES Study (CNESS) would be led by a certified NES Study Group chair, who would select an appropriate set of subject matter experts to aid in the review. The CNESS team would take input from the weapon safety specification, process descriptions, tooling and tester concepts, and requirements process flow documents. The CNESS would likely take place in parallel with the Hazard Analysis Task Team reviews. This process has been presented to and agreed upon by PXSO and the NES Division manager.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending May 14, 2010

DNFSB activity: R. Rosen and T. Spatz were at Pantex to observe the first week of the W84 SS-21 Nuclear Explosive Safety Study. W. Andrews was onsite to augment site rep coverage.

Lift Planning and Execution: The documented safety analysis contains a specific administrative control (SAC) that requires the operations center (OC) to authorize all crane operations in the material access area (MAA). The OC utilizes the lift plan for the crane operation to determine whether they must limit the duration of the lift authorization. Typically, this will occur if the lift is scheduled to take place near an approved nuclear explosive or explosive transportation route. This week, per the lift plan associated with a construction activity in the MAA, the OC instructed the B&W liaison for the construction subcontractor to cease lifting operations at a specific time in anticipation of a material move. The liaison failed to discontinue lifting operations when the authorization for the lift expired. The subject SAC is covered by the Generic Limiting Condition of Operation (LCO). Therefore, upon notification of this noncompliance (approximately 24 hours after the lift authorization expired), the manager for nuclear facility operations entered the Generic LCO, determined compliance with the SAC had been achieved (i.e., lifting operations had ceased), and exited the LCO.

B&W and PXSO determined this event was not a technical safety requirement (TSR) violation because the version of the lift plan utilized by the OC did not correctly represent the TSR implications of the lift. The original version of the lift plan correctly stated that the lift was not taking place near an approved nuclear explosive or explosive transportation route. However, this information was deleted in subsequent revisions to the lift plan. B&W will perform a causal analysis to address the configuration management and formality of operations issues from this event.

Conduct of Operations: Technicians assembled a W88 arming, fuzing, and firing (AF&F) system using the incorrect revision of the procedure. They subsequently installed the AF&F onto a nuclear explosive. The process engineer had recently revised the procedure but the new issue never made it to the nuclear explosive bay. There were no safety or quality issues that resulted due to the nature of the changes to the procedure.

There are several controls intended to prevent such an occurrence. Every time technicians perform pre-operational checks—which occur every shift or every 24 hours for a continuously performed operation—they are required to verify procedures against an electronic database that lists the current revision as well as any applicable annotated changes. The technician must initial the pre-operational checklist to document completion of the verification. Once the technicians complete the entire checklist, everyone involved is required to review it to verify completion of all tasks. In this instance, the technician failed to adequately verify the procedure and did not initial the checklist. Also, all of the technicians failed to review the checklist carefully and missed the fact that the initials for the procedure verification were absent from the checklist. Finally, the technicians failed to maintain a cover sheet on the procedure that tracks these verifications, tracks procedure changes, and ensures that annotated changes have been incorporated as required.

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 May 7, 2010

The site representatives were at DNFSB Headquarters in Washington, DC. This report is submitted for continuity purposes only.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending April 30, 2010

Offsite Shipments: As reported on 1/8/10, B&W had shipped a canned subassembly (CSA) to Y-12 with a serial number on the shipping label that did not match the serial number on the component. Since then, there have been two additional events involving a discrepant CSA serial number. The second event occurred during shipping container packaging preparations. The lids from multiple drums were removed and placed out of the way. Upon reassembly, the lids were not placed on their matching drums. The most recent event resulted from a technician misreading a "9" as a "7". B&W suspended similar shipments pending a full investigation and causal analysis. In addition, B&W will evaluate the causal analysis and corrective actions from the first event to determine whether they should have prevented the final two occurrences.

Lightning Safety: Lightning subject matter experts (SMEs) from the Nuclear Security Enterprise Electromagnetic Committee met last week at Pantex. The primary objective of the meeting was for the design agency SMEs to observe firsthand the new method of verifying intrinsic bonding of facility penetrations to the Faraday cage. The new method first utilizes time-domain reflectometry (TDR) to establish whether the penetration is intrinsically bonded on a global scale. To determine whether the intrinsic bond exists at the Faraday cage boundary, the analyst utilizes TDR to measure the distance of the conductive path between an established connection to the facility Faraday cage (a ground lug) and the penetration. The analyst will deem the penetration intrinsically bonded if this measured distance is within some margin-of-error of the distance reconstructed from the dimensions of the Faraday cage represented in drawings and old construction photographs. The SMEs raised no issues with the new method and the B&W participants on the committee will continue to prepare the supporting documentation (i.e., engineering evaluation) needed to obtain formal committee approval.

Loss of Power Events: A nuclear explosive cell lost primary power on two occasions in a four day span. The limiting conditions of operation (LCO) for the deluge fire suppression system in this facility state that both primary and secondary power are required for the system to be fully operable. Following the second event, the facility manager entered the LCO for loss of primary power because there were greater than Hazard Category 3 quantities of nuclear material in the facility. Per the action statements of the LCO, fire protection engineering personnel evaluated the configuration of the material and determined a fire watch was not necessary. The secondary power supply (batteries credited to provide power for 24 hours) worked as designed in both events.

Maintenance personnel determined the cause of both events was similar. In both cases an older piece of equipment—in one case a heater and the other an electrical ballast in a lighting panel—caused a ground fault, which tripped the main breaker in the facility. System engineering personnel believe the two events were independent and are not indicative of a more global deficiency in the facility electrical distribution system. Fire protection personnel have been planning to add a redundant secondary power supply for all deluge fire suppression systems to facilitate removal of primary power from the operability requirements for this system.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending April 23, 2010

Potential Inadequacy in the Safety Analysis (PISA): Early one morning, material handlers were preparing to load two vehicles with canned subassemblies (CSAs). After they moved the CSAs from the warehouse where they were staged to the loading dock, the plant shift superintendent (PSS) issued a severe weather warning. The severe weather program is a specific administrative control (SAC) covered by the generic limiting condition of operation (see 11/27/09 and 3/12/10 reports). Severe weather warnings are issued for high wind, tornado, or severe thunderstorm warnings. The control requires that operators move CSAs (or other items such as nuclear explosives [NEs]) into an approved structure or an NE or nuclear material transport trailer with the doors closed upon issuance of the warning.

The material handlers decided to load the trailers because the dock area was not an approved structure. Later, they realized they needed to close the doors; however, they would have had to move the trailers at least ten feet to allow the doors to close. They remembered they were not allowed to move trailers unless all of the CSAs were tied down (this is another SAC), but that would have taken about an hour to perform properly. Instead of taking an action that would have been compliant with the SAC (e.g., moving the CSAs to an approved structure) they chose to do nothing. About 20 minutes later, the PSS lifted the severe weather warning. This event was initially declared a Technical Safety Requirement (TSR) violation, but the next day B&W changed the event categorization to a PISA since closing the trailer doors in this situation would require violation of the tie down SAC.

Missed In-Service Inspection (ISI): While performing monthly ISI activities on a facility crane assembly in a nuclear explosive bay, maintenance personnel noticed the sticker for the annual hoist insulator ISI—which ensures the hoist pendant and hoses will sufficiently limit the current to the lightning sensitive component following a lightning strike—indicated the inspection was approximately 10 months overdue. They immediately contacted the on-shift facility manager who subsequently set the facility material limits to zero after he was unable to locate any evidence that the hoist insulator ISI had been performed within the required time frame. The following day, the day-shift facility manager located the relevant paperwork, which showed the ISI had been initiated in May 2009, but maintenance personnel never completed the work. The facility manager returned the facility to operational status after the hoist pendant passed the current-limiting requirements associated with the ISI.

Transportation Accident: While attempting to park an empty NE transportation trailer in an approved NE staging area, the driver contacted a metal pole, rupturing the fuel tank and spilling approximately 20 gallons of fuel (the TSRs specify a limit of 30 gallons of fuel for all NE transport trailers). The driver's supervisor contacted the PSS, who immediately dispatched the spill team. The spill was contained within two hours. B&W management has removed the driver's qualifications and will require spotters for all NE transportation trailer parking in Zone 4 until a formal investigation and causal analysis has been completed. NE transport trailers are qualified to protect thermally-sensitive contents from the fuel fire that could have resulted from this spill.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending April 16, 2010

DNFSB activity: J. Anderson, B. Laake, J. MacSleyne, R. Raabe, R. Verhaagen, and outside expert D. Volgenau were at Pantex to assess the implementation of Integrated Safety Management in the planning and control of activity-level work and verify that technical procedures and maintenance work packages include appropriate controls for worker protection.

Special Tooling: Technicians were raising a W76 unit using the 1230 assembly cart in preparation to rotate the unit from a horizontal to a vertical configuration when they observed that an anti-rotation pin failed to engage as designed (see 4/9/10 report for other work suspensions related to the 1230 cart). The anti-rotation pin is part of an interlock that ensures technicians cannot rotate the unit at a height that would cause the unit to impact the bottom of the 1230 cart. Technicians immediately suspended the operation. The process engineer developed a recovery procedure that directed the technicians to hoist the unit to a replacement 1230 cart and continue the operation. Technicians successfully executed the recovery procedure the following day. The tooling engineer has not completed a formal evaluation of this particular tooling malfunction; however, a similar malfunction of the 1230 cart occurred in January and the engineering evaluation of that malfunction concluded it was caused by a burr in the retracting pin. In that instance, the tooling engineer determined no other actions (aside from repairing the cart) were necessary because this interlock is functionally tested by tooling production support personnel before they release the 1230 cart for use.

Technical Safety Requirement (TSR) Assessments: During FY09, B&W began the process of formally evaluating 20 percent of the TSRs each year. The authorization basis department recently completed a management self-assessment (MSA) of the effectiveness of this TSR assessment program. After reviewing aspects of 108 TSR assessments (e.g., training, issues identification and resolution), the MSA team concluded that the TSR assessment program is effective at identifying, tracking, and resolving issues related to the implementation of TSRs. The lone finding from the MSA captured the fact that the team lead for a TSR assessment had not completed all required training. The MSA also noted that B&W's performance assurance department, through their experience in performing independent evaluations of the TSR assessments, developed new criteria, review, and approach documents that should enhance the thoroughness of the TSR assessments by requiring control owners to understand how the control was derived in the documented safety analysis before they evaluate whether it was properly implemented.

B61 Operations: During an operation in a non-nuclear bay to dismantle a portion of the bomb case that contains the spin rocket motor, a technician inadvertently dropped a subassembly while preparing to transfer it from a work stand to a table. The process step is relatively awkward due to the design of the work stand and the subassembly's center of gravity. The subassembly sustained minor damage from the impact. While it was on the floor and without bonding himself using wrist straps, the technician lifted it up and determined that the shorting plug was still in place. He picked the subassembly up and placed it on the table then notified his supervisor. B&W plans to meet next week to discuss whether the technician responded appropriately and to discuss potential changes to the tooling and procedures.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending April 9, 2010

W78 Operational Safety Review (OSR): B&W submitted and PXSO approved a closure plan for the two post-start findings from the W78 OSR that occurred last November. The first finding was that bare high explosive (HE) components are not sufficiently protected from mechanical impacts that may initiate the HE. Some changes to address the finding have been made. Additionally, B&W will evaluate and implement use of new or modified existing carts for installing and removing tooling during HE operations. These changes are due May of next year. The second finding was that some dissipative drag straps used in carts are not flexible enough to provide reliable continuous contact with the dissipative floor, thus defeating an important electrostatic discharge control element. B&W will redesign the drag strap or implement another existing design that is more reliable. Completion of this action is due in September.

Radiation Protection Program: B&W submitted a revised version of the Radiation Protection Program to PXSO. This version is intended to bring the program into compliance with a June 2007 change to 10 CFR 835. Implementation throughout DOE is required by July. The only exemptions in use at Pantex continue to be for nuclear accident dosimetry.

Separation System Testing (Sep Test) Operations: NNSA has announced that it will terminate Sep Test operations—a surveillance test that gathers data associated with the performance of the release assembly—for war reserve (WR) submarine-launched ballistic missile systems at the end of FY11. As documented in an associated impact evaluation by Sandia National Laboratories (SNL), NNSA and the Department of Navy (DON) are developing an alternate release assembly (ARA) that, when fielded, will render Sep Test operations at Pantex obsolete because the ARA will never be installed on units shipped to Pantex. SNL believes the type of data currently obtained in Pantex Sep Tests can be obtained for ARAs using an inert test body. NNSA has indicated that it will negotiate with the DON, Strategic Systems Programs on alternative testing options that do not require the use of WR units.

Special Tooling: Technicians use the 1230 cart as the workstand and transfer cart for most operations on configurations in which an aeroshell is installed. During the last year, technicians were forced to declare several work suspensions on operations involving the 1230 cart. Examples of the events that led to these suspensions include: the inability of the cart to mate with an enhanced transportation cart (see 3/13/09 report), the cart trunnions locking up while technicians were raising the unit (see 8/21/09 report), and the loss of function of the hand crank during a nuclear explosive operation. While none of these suspensions led to a direct safety concern, the tooling design engineer did identify several modifications to the cart that would prevent recurrence of these events. The engineer initiated the work order to revise the cart in January, but production tooling support personnel are still in the process of scheduling the revision to the 58 copies of the tool. Because of the cart's ubiquity and B&W's desire to maintain current production rates, production tooling support will only be taking a few carts out of service at a time to perform the revision. The complete revision of all 1230 carts will likely take another several months.

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 April 2, 2010

Electrostatic Discharge (ESD) Control Enhancement: Prior to entering operational facilities with static dissipative flooring, all personnel must pass a minimum electrical continuity requirement (specifically, the foot to hand continuity) using a footwear checker. Since its inception, this process has been controlled administratively—B&W relies on postings and training to ensure that all personnel pass the minimum electrical continuity requirement before entering an ESD program area. By the end of April, B&W plans to install a new technology (at first in one facility) that controls this process in an engineered manner by interlocking the badge reader with the footwear checker. Personnel will have to pass the footwear checker in order to lower a plate covering the badge reader, at which time they can complete the access process and enter the facility.

Documented Safety Analysis (DSA) Improvement Initiative: This week, B&W issued the third revision of the DSA Improvement Initiative, an effort aimed at reducing the number of technical safety requirement (TSR) violations at Pantex (see 3/27/09 and 8/7/09 reports). The four focus areas from the first issue of the initiative remain the same, but the latest version contains several additions and modifications to the actions within some of the focus areas. Of note, B&W modified the completion date of the action associated with the administrative control (AC) reclassification effort to reflect its deferral to the second quarter of FY11 (see 3/19/10 report). For the remainder of FY10, B&W is redirecting the resources that would have been applied to the AC reclassification effort toward creating a basis document to expand and clarify the applicability of current ACs developed in the Sitewide, Transportation, Staging, Nuclear Material, and all satellite facility safety analysis reports. This basis document would aid safety basis analysts in performing unreviewed safety question determinations, and will provide a solid foundation for the AC reclassification effort when it resumes in FY11.

W87 Nuclear Explosive Safety (NES) Change Evaluation: A W87 recently failed an electrical test that indicated a short within the weapon electrical system. Technicians suspended the operation. Further electrical testing will be required to isolate the problem. The design agency wrote in a special instruction engineering release that there are no safety concerns because the environmental sensing device and the mechanical safe and arm detonator have been verified to be in the safe position. DOE O 452.2D, *Nuclear Explosive Safety*, prohibits redundant electrical tests or electrical troubleshooting unless the procedures and test equipment have been subjected to a NES evaluation for the specific application. Therefore, this week a NES change evaluation group evaluated the proposed operations and determined that they would not pose a threat to NES. The group did not identify any findings and there were no deliberation topics.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

MEMO TO: Timothy Dwyer, Technical Director
FROM: Matthew Duncan and Rory Rauch, Pantex Site Representatives
SUBJECT: Pantex Plant Report for Week Ending March 26, 2010

Lightning Safety: The Nuclear Security Enterprise Electromagnetic Committee met this week to discuss several unresolved lightning safety concerns. Lawrence Livermore National Laboratory (LLNL) is finalizing the last of several analyses that demonstrate its weapon programs screen from the hazard posed by the time-varying electric and magnetic fields (i.e., indirect effects) generated in Pantex nuclear explosive facilities following a design basis lightning event. LLNL expects to formally transmit the results of these analyses to Pantex within the next 30 days, at which time the committee will close this issue. As part of the committee's effort to disposition the postulated bond wire inductance hazard, B&W presented the data it had collected using a new method of intrinsic bond verification (see 3/12/10 report). The committee believes the new protocol will be able to establish intrinsic bonding of facility penetrations to the Faraday cage with the level of assurance required to support nuclear safety applications, but would like to observe the new protocol firsthand before passing final judgment. B&W will demonstrate the new protocol when the committee reconvenes on April 20.

W88 Operations: Perceptive technicians noticed a minor anomaly with a canned subassembly and suspended the operation. At this stage in the process a component is suspended by a vacuum fixture. While the configuration was initially considered safe and stable, engineers later determined that tooling could be installed that would provide additional defense in depth in the unlikely event of vacuum fixture failure.

Procedures: Two events this week are driving procedure enhancements. In the first event, technicians discovered that a recently assembled pit shipping container was missing several protective caps that are required by the container's product definition. Since these caps are prone to falling out the process engineer will revise the procedure to ensure proper cap installation.

The second event involved pit gas sampling. A sample bottle had made it to the laboratory, but technicians discovered it was empty. While the exact cause is unknown, corrective actions for the most likely causes are being implemented. The gas sampling procedure will be revised to require independent verification of the position of a valve. The formality of sample bottle handling and tracking will also be increased.

Joint Test Assembly (JTA) Operations: Technicians inadvertently caused minor damage to a detonator cable assembly on a high fidelity JTA during a relatively difficult series of continuously performed steps involving a hoist. While all current nuclear explosive operations have benefited from SS-21 upgrades, some JTA operations (like this one) continue to use an old process and tooling. In this case, no SS-21 assembly process or tooling exists as the weapon program does not currently have a mission need to perform any assembly operations. JTA operations by their nature have minimal nuclear safety impact—when live main charge explosives are used a dummy pit is also used—except for the potential impacts of an explosion on nearby nuclear operations (which is controlled by technical safety requirements). PXSO and B&W are discussing what, if any, improvements should be made to these processes to reduce the likelihood of similar component damage in the future.

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 March 19, 2010

Electrostatic Discharge (ESD) Control Program: This week, PXSO approved a documented safety analysis (DSA) change that added the ESD Control Program to the Sitewide safety analysis report. The ESD Control Program is not a safety management program in the conventional sense; rather, it conveniently consolidates the different methodologies used to characterize the mitigated and unmitigated ESD environments, identify the hazards, and establish the controls. The application of these methodologies to specific hazard scenarios and weapon response rules can still be found in the hazard analysis report (HAR) for a given weapon operation. PXSO did establish one condition of approval (COA) for this DSA change based on its judgment that the draft W84 HAR does not adequately describe the administrative actions necessary to support the use of static dissipative flooring as a design feature. As part of the COA, PXSO suggests one way to correct this shortcoming is to establish these actions as a programmatic administrative control in the new ESD Control Program.

In conjunction with incorporating the ESD Control Program into the DSA, the change also eliminated the static dissipative flooring buffer zone as a technical safety requirement (TSR). The static dissipative flooring buffer zone was established to isolate lightning sensitive components from the electrical current flowing through the facility wall following a design basis lightning strike. In the engineering evaluation that supports the elimination of this TSR, B&W concluded the buffer zone is not necessary because the hazard presented by lightning current flowing onto the static dissipative flooring is no different than the hazard presented by lightning current flowing onto the original facility flooring. The nuclear security enterprise electromagnetic committee is evaluating this hazard as a part of its efforts to disposition potentially multi-point grounded weapon configurations.

Re-classification of Administrative Controls: Last week, B&W submitted a request to remove the administrative control re-classification initiative, which requires B&W to evaluate all administrative controls for potential re-classification (e.g., as a specific or programmatic administrative control) or removal from the DSA, from the fiscal year (FY) 2010 performance evaluation plan. This initiative cannot be completed in FY10 because PXSO, which must approve any control re-classifications resulting from the evaluation, has committed its safety basis group to other, higher priority projects (e.g., review and approval of the W84 and B53 SS-21 HARs) for the remainder of the fiscal year. The administrative control re-classification effort is one of the focus areas of B&W's plan to reduce the number of TSR violations at Pantex.

Tester Upgrade: The PT-4030, an electrical resistance tester used on every currently operating weapon program, has been obsolete for several years. As a result of the consequent part shortage (maintenance personnel have been scavenging replacement parts from the excess inventory of PT-4030 testers), B&W recently began design of a replacement electrical resistance tester. The new tester is scheduled for a conceptual design review in April and qualification by the end of FY11. At that time, B&W will begin to implement the new tester on a program-by-program basis.

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 March 12, 2010

Lightning Safety: The lightning committee, in its efforts to disposition a postulated bond wire inductance hazard, has been working for two years to develop a methodology that verifies intrinsic bonding of facility penetrations to the Faraday cage. B&W personnel recently resumed facility-level testing to support the development of time domain reflectometry (TDR) as a method of intrinsic bond verification. B&W was forced to postpone this testing for several months while it resolved equipment issues. During the postponement, system engineering personnel developed what they hope to be a more efficient, defendable TDR protocol (personnel can now establish intrinsic bonding directly from the instrument's output data rather than performing a series of computations). The lightning committee plans to meet this month, at which time the B&W representatives on the committee will present the data gathered using the new protocol and the committee will determine the steps needed to vet, implement, and approve its use.

Prohibited Items: While establishing a fire watch, technicians discovered prohibited items—a 1.4g explosive and a pre-flight controller with spin rockets—in the equipment interlocks of two separate bays. Technicians had placed the items in their respective interlocks two days prior while preparing to restart operations following maintenance activities. In response to this discovery, B&W exercised the newly implemented Generic Limiting Condition of Operation (LCO, see 11/27/09 report). Per the action statements of the Generic LCO, if B&W finds that it has failed to comply with a specific administrative control (SAC) covered by the LCO (the LCO governs about 50 SACs), compliance with the SAC shall be restored immediately. In this case, technicians placed the items in their respective operating bays. As an extent-of-condition review, manufacturing management directed technicians to inspect all equipment interlocks and verify the absence of prohibited items. B&W management held a stand-up briefing to remind the technicians involved with the incident of the applicable requirements. Prior to the implementation of the Generic LCO (which is allowed per DOE-STD-1186), this incident would have been declared a technical safety requirement (TSR) violation and externally reported.

Positive Unreviewed Safety Question (USQ): While reviewing a work package for maintenance on the dynamic balancer in a mass properties bay, the system engineer noticed a discrepancy between the bolts on the drawing and the bolts that were specified in the work package. The actual bolts had coarse threads, whereas the bolts specified in the work package contained fine threads. The engineer updated the work package to require the installation of coarsely threaded bolts and the maintenance was completed. Approximately two weeks later, the engineer discovered this discrepancy affected the safety basis. As currently specified in the TSRs, the dynamic balancer is required to withstand a torsional load of 35,880 ft.-lbs—a safety factor of 102:1 relative to the actual torsional load required. The coarse bolts reduced the safety factor to 101:1; therefore, B&W declared a positive USQ. The system engineer will update the calculation to reflect the use of coarse bolts. The authorization basis department plans to change the TSR to specify only the required minimum safety factor, not the full capability of the bolts.

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 March 5, 2010

W78 Operational Safety Review (OSR): In November 2009, NNSA convened an OSR (a five year re-evaluation of an operation by nuclear explosive safety (NES) personnel) of W78 disassembly and inspection operations. In December, the OSR group issued a report to NA-122 for review and final approval identifying one pre-start and one post-start finding. The pre-start finding captured the judgment of the OSR group that NES was not assured during W78 disassembly for certain operations around bare conventional high explosives.

PXSO recommended the pre-start finding be re-categorized (to a post-start finding or deliberation topic), citing its judgment that the issues identified by the OSR group would not make the operation unsafe if left unaddressed. Upon further consideration, the OSR chairman also recommended the finding be re-categorized (to a post-start finding) based on actions taken by the W78 project team to correct most of the shortcomings that led to the finding. Based on these recommendations, NA-122 re-categorized the finding as a post-start and formally approved the OSR group's report. The other post-start finding, which captured the discovery that the ground strap on a transfer cart would fail to maintain electrical continuity with the static dissipative floor if perturbed in a specific way, was left as originally categorized. NA-122 designated PXSO as the federal lead for managing the findings.

Tritium Detected: Technicians were removing a tritium reservoir from a W76 when the co-located airborne tritium detector alarmed, indicating airborne activity levels exceeding 10,000 $\mu Ci/m^3$. Previous steps in the procedure explicitly require the technicians to evacuate the facility and contact radiation safety if the detector alarms. In this instance, the detector unexpectedly alarmed at a point in the procedure that contained no explicit instructions for how to respond to the alarm. Therefore, the technicians contacted their supervisor before exiting the facility. After the evacuees arrived at the muster station, the supervisor contacted radiation safety. Radiation safety personnel entered the facility twice within a 30 minute period, found readings consistent with activity levels normally encountered during this operation (approximately 50 $\mu Ci/m^3$), and confirmed it was safe to restart operations, pending NES approval. Detector readings during reservoir removal are the result of tritium off-gas collecting in a valve on the unit. Radiation safety personnel believe the higher levels of off-gassing on this unit are the result of the length of time the bottle had been installed.

Nuclear Security Enterprise Reengineering Activities: B&W Pantex recently evaluated the feasibility of tailored governance reform and concluded the Kansas City Plant (KCP) governance model could easily be applied to most operations at Pantex. The study focused on the element of the KCP governance model that involves directives reform. B&W Pantex identified 96 of the 350 directives in the contract for initial consideration and recommended to PXSO that it use the results of the analysis conducted by KCP (rather than conducting its own analysis) as the basis for how to disposition these directives. PXSO formally concurred with this approach and asked B&W Pantex to develop an FY10 project execution plan. A further review could include directives governing nuclear operations, but B&W in the initial scope of this plan. In addition to pursuing directives reform, B&W Pantex has requested an evaluation of its Contractor Assurance System by B&W Technical Services Group (a corporate entity) in the March/April timeframe.

B&W Staffing: Greg Meyer resigned from his position as general manager of the Pantex Plant. John Woolery, the former deputy general manager for operations, replaced him on Friday.

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 February 26, 2010

Person-to-Person Coverage Nuclear Explosive Safety Change Evaluation: T. Hunt was at Pantex this week to observe a Nuclear Explosive Safety Change Evaluation for a proposed change to operating procedures to remove the person-to-person designators ("[M]" is put in the margin of every step that requires it) in favor of a system that uses procedural steps to direct the technicians to post standardized signs designating person-to-person coverage. B&W suspended the evaluation and expects to restart it in several months after the project team performs a human factors analysis.

W87 Operations: Technicians damaged a cable while sliding it through a slot in the physics package during a W87 disassembly operation. They immediately suspended operations and contacted their supervisor. B&W is awaiting instructions from Lawrence Livermore National Laboratory regarding how to proceed, but does not believe the damage to the cable will impact safety for the remainder of the operation. Before performing the next W87 disassembly, B&W will incorporate a tool, which technicians already use during assembly operations, to help technicians guide the cable through the subject slot. The cable that was damaged is part of a circuit that allows technicians to verify the state of a component prior to reaching lower levels of disassembly.

Conduct of Maintenance: A work order to tighten loose bolts on a support I-beam for a safety-class structure supporting a dynamic balance and mass properties measurement machine specified bolts that were different than what was actually installed in the field. Upon discovery, the maintenance worker should have stopped work. Instead, the individual tightened the bolts to a torque value based on a reference book, even though different torque values were specified in the work order. The worker also discovered that a bolt was missing and replaced it. B&W suspended the worker's qualifications. System engineering personnel evaluated the situation and had maintenance personnel install the appropriate bolts.

High Pressure Fire Loop: This ongoing construction project will replace thousands of feet of deteriorating safety-class piping. In a letter to B&W, PXSO noted several recent instances of ineffective quality control and quality assurance in construction execution. Some examples include: (1) installation and subsequent replacement of non-conforming bolts, (2) installation and subsequent replacement of non-conforming flange assemblies for fire hydrants, and (3) receipt and acceptance of non-conforming post indicator valves. In some cases, multiple opportunities to correct these deficiencies were missed throughout the ordering, receipt and inspection, and installation processes.

W88 Operations: Technicians discovered damage to a detonator cable assembly during an assembly (prior to the introduction of any special nuclear material) and suspended operations.

DOE Voluntary Protection Program: B&W Pantex achieved STAR status this week.

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 February 19, 2010

Operational Lesson Learned: Technicians were performing a cutting operation to separate a nuclear explosive from its aeroshell when the cutter flexed excessively and scratched the unit. Because of the threat of contamination from such an event, the procedure directing the operation contains a warning requiring the technicians to suspend operations and contact radiation safety if the unit incurs any damage. However, the damage went unnoticed by the technicians and the unit was transported from the facility for further disassembly. The technicians in the destination facility noticed the scratch while preparing for the subsequent disassembly operation and immediately contacted their supervisor. Radiation safety personnel swiped all potentially contaminated tooling and equipment and found no contamination. Process engineering plans to revise the subject procedure to require technicians to perform a complete inspection of the unit upon completion of the cutting operation.

Special Tooling: During W76-1 assembly operations, technicians install the pit using a tool that moves the pit along a semi-circular path from the transfer cart to the workstand in a controlled manner. This week, one of the two bearings that provide the pivot point for this movement broke after technicians lifted the pit approximately 30 degrees from its initial resting position on the transfer cart. Technicians returned the pit to its resting position, suspended operations, and contacted tooling personnel. After evaluating the configuration, tooling personnel concluded that the pin at the end of an interlock, which ensures the technicians only install the vacuum fixture that holds the pit when the tool is at rest, failed to retract fully and placed excessive stress on the pivot bearing, causing it to break. Process engineering will modify the procedure to prompt technicians to inspect the bearings and ensure the pin is fully retracted prior to beginning the operation. Tooling personnel are considering a redesign of the tool to make the pivot bearing more robust.

B61 Operations: The NNSA readiness assessment that reviewed B61 command disablement testing operations has been completed. The assessment team developed one post-start finding related to the fire hazards analysis documents for the facilities where this operation will take place. One or all of the applicable fire hazards analyses: (1) contained out of date plant standards and DOE orders, (2) did not properly evaluate toxic or radiological releases due to fires (one assumed the facility had HEPA filtration when it does not), (3) did not evaluate the impact of lightning on fire safety, (4) did not include the cost of operational interruptions and weapon component values in the maximum possible fire loss calculation, (5) did not thoroughly evaluate how fire water run-off would be handled by the fire department, and (6) did not list the safety systems that are susceptible to fire damage. This week, PXSO approved B&W's corrective action plan and authorized startup of the operation.

W80 Operations: B&W Pantex recently allocated additional technicians to support W80 operations. W80 deliverables are scheduled to increase by approximately 50 percent above the original FY10 baseline.

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 February 12, 2010

Facility Management: B&W recently responded to PXSO's letter (see 12/25/09 report) which expressed concern over an observed negative trend with respect to the conduct of facility management in recent years. One of B&W's key corrective actions is to develop "check sheets" for every safety system that has limiting conditions for operation (LCO). These check sheets will contain sufficient information to help facility managers and system engineers determine whether or not safety systems are operable. Additional corrective actions are focused on enhancing the facility manager requalification process, improving and formalizing communication protocols, and evaluating whether certain LCO operability statements could be clarified. Finally, B&W management has directed facility managers to conservatively enter LCOs immediately once a problem with a system has been identified. In the past, facility mangers would typically wait to discuss the problem with the system engineer or other subject matter experts before taking the actions directed by the LCO.

PT3669 Nuclear Explosive Safety (NES) Change Evaluation (NCE): In January, NNSA convened an NCE to evaluate changes to the PT3669 in-situ mechanical safe and arm detonator tester. B&W, in consultation with Lawrence Livermore National Laboratory (LLNL), made these changes to enhance the quality and reliability of the tester, but B&W, as required by NES directives, requested the NCE since the changes affected two safety-related components. The NCE group did not find any issues with the proposed changes; however, they did identify several process issues associated with outdated tester requirements and concluded that NNSA and the design agencies need to revisit and redefine the requirements and review processes for Category 1 electrical equipment (defined as equipment intended for connection to an electrical circuit of a nuclear explosive).

PXSO approved the PT3669 NCE approximately three weeks after the NCE group completed deliberations. The NCE chair delayed issuing the final report until LLNL approved several hardware changes, drawing suffix changes, part number typographical errors, and drawing updates, which were ongoing during the NCE. During LLNL's review, an NCE group member identified an error in the calculation of the center of gravity of the tester. The ensuing discussion between LLNL and B&W regarding how to resolve this concern—the tester would slide in a performance category-3 seismic event—further delayed LLNL's approval of the changes. Ultimately, the authorization basis department determined this scenario would not present a hazard to the weapon.

B53 Dismantlement: Los Alamos National Laboratory has discovered an issue that will change the weapon response for the proposed B53 dismantlement process. In response to this discovery, the B53 project team plans to modify seven tools to increase their electric charge dissipation rate (when modified, the tools will be able to bleed charge from the unmitigated voltage environment to 100V, instead of 5 kV, in one second). The project team does not believe this issue will impact the scheduled authorization date of September 2010 for B53 dismantlement operations.

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 February 5, 2010

The site representatives were at DNFSB Headquarters in Washington, DC. This report is submitted for continuity purposes only.

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 January 29, 2010

W76-1 Operations: B&W received authorization from the design agencies (DAs) to restart all W76-1 operations, with certain exceptions, last Friday. Besides the noted exceptions (for which a final conclusion regarding the safety of operations has yet to be made), the DAs have determined that there are no safety implications of the cause of the suspension.

B61 Operations: Approximately two weeks ago, a B61 disassembly operation was suspended after technicians were unable to separate the pit from a high explosive (HE) charge. Additional attempts to perform the separation using the techniques and tooling specified in the procedure have also been unsuccessful. Technicians will sometimes encounter variable levels of resistance while attempting to separate the pit from an HE charge, but a B61 unit has never stuck in this configuration before. B&W is designing a new tool, which should be available in March, to complete the operation. B&W is considering whether to permanently incorporate the tool as a process improvement.

New Information: B&W declared another potential inadequacy of the documented safety analysis (PISA) this week to reflect new information that has the potential to change an unmitigated hazard analysis in the W76 hazard analysis report. The weapon response request had been outstanding for several months and, until this week, B&W management had been granting extensions on the new information until the design agency could provide formal weapon response. Operations were deemed safe to continue in the interim because site management believed the mitigated environment was adequately understood and controlled. This is the third PISA declared as a result of new information in three weeks. The increase can be attributed to the fact that B&W has reduced its threshold for declaring PISAs in certain situations. For example, the need for the DA to formally issue weapon response is no longer deemed a viable basis for deferring PISA declarations.

Electrical Safety Requirements: Several components of category 2 electrical equipment (equipment not intended to make an electrical connection to a nuclear explosive or high explosive subassembly but could or does make a mechanical connection) were discovered without the required NRTL listing. At least one of the electrical safety evaluations noted that the components were available as UL listed intrinsically safe; therefore, the evaluator required the applicable drawing to specify the use of NRTL listed versions of the components. While none of this equipment had been used on a nuclear explosive, B&W is evaluating potential improvements to the electrical equipment evaluation and procurement processes to prevent recurrence.

Fire Protection: A recent PXSO assessment of B&W's fire protection program found inconsistencies between B&W's frequency of inspection, testing, and maintenance and the frequencies specified by the recently adopted 2008 version of NFPA 25. In some cases, no approved equivalency exists that supports a less conservative frequency. Another assessment found several examples where assumptions and bases credited in a facility fire assessment (FFA) or fire hazard analysis (FHA) are not properly documented or periodically reviewed and confirmed during performance of the FHAs and FFAs, as suggested by the DOE guide and required by B&W's procedures. In addition, three FHAs had not been reviewed within the three year periodicity required by DOE O 420.1B.

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 January 22, 2010

Special Tooling: Prior to starting a W76 disassembly operation, technicians discovered that the latch on the workstand that holds the swing arm away from the unit was broken. Operations never commenced and engineering personnel met to discuss potential restart options. The swing arm is credited to protect sensitive configurations from tools or subassemblies that are being added or removed from the unit. However, when not in use, the swing arm also presents an impact hazard if it is not held in place. B&W determined the introduction of the tooling required to perform an in-service repair would present a greater hazard than completing the disassembly with a technician holding the swing arm away from the unit. Therefore, B&W has prepared a justification for continued operations (JCO) to capture the risk associated with administratively controlling the swing arm. PXSO expects to receive the JCO early next week. B&W plans to remove the workstand from the facility for repair after this unit, at which time the JCO will no longer be valid. Tooling is performing an extent of condition review to ensure a similar problem does not exist on other copies of the workstand.

Potential Inadequacy in the Documented Safety Analysis (PISA): B&W declared a PISA to reflect an unanalyzed hazard scenario during W78 operations. B&W will request weapon response to determine whether additional controls or process changes are necessary. Until then, B&W will rely on the secondary support features of the tooling utilized during the subject operational sequence as a compensatory measure. No compensatory measures were identified for the operations that take place prior to the engagement of the secondary support features; B&W believes the time-at-risk for the unanalyzed hazard during this part of the operation is sufficiently low.

Transportation Procedure Violation: The Pantex Material Move System is used to authorize the safe transportation of nuclear explosives, explosives, and nuclear material within the plant. Several Specific Administrative Controls (SACs) are intended to prevent movement of high explosives (HE) while a nuclear explosive or nuclear material is also being transported nearby. Recently, a configuration 1 nuclear explosive-like assembly (NELA)—a designation for a unit containing live main charge HE and an inert pit—with a canned subassembly (CSA) was incorrectly denied permission by the system to be moved outside of the HE move window. Later, the window was opened and the item was moved. After the move, the production section manager realized that plant procedures (those that implement the transportation program SACs mentioned above) require NELAs with CSAs to be moved while the HE move window is closed. Upon discovery, the generic Limiting Condition of Operation was entered as a precaution but no actions were ultimately necessary. It turned out that no other prohibited items were being transported at the time, so the SAC was not violated. Further research determined that the NELA was labeled incorrectly in the plant's material resource planning tool, causing the system to prevent it from being moved outside of the HE move window. An extent of condition reviewed revealed that several other NELAs, which had not yet been assembled, were also labeled incorrectly.

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 January 15, 2010

Special Tooling: B&W recently discovered that a tool did not match its bill of materials; the length of a piece part was shorter than specified. The tool, which had been used for approximately 18 months in nuclear explosive operations, was immediately removed from service. B&W has concluded that there were no safety concerns as a result of this discrepancy. Subsequent research revealed that other copies of this tool were found to be similarly discrepant when they arrived from the vendor (Sandia National Laboratories, SNL) several years ago. The discrepancy was corrected on some of the tools, but no extent of condition review was initiated. As a result, the subject copy of the tool was never recalled from the line. B&W has initiated a full bill of materials inspection on all tools manufactured by SNL. Further, tooling acceptance is determining the best method to ensure that extent of condition reviews are initiated in all appropriate instances in the future. It should be noted that SNL no longer manufactures special tooling for Pantex.

Potential Inadequacy in the Documented Safety Analysis (PISA): B&W declared a PISA this week to reflect the discovery of an unanalyzed hazard scenario in the W78 Hazard Analysis Report (HAR). The scenario was first postulated in early November, but B&W was awaiting a formal response from the design agency to determine whether the scenario was credible enough to warrant a PISA declaration. B&W requires new information to be closed within 10 working days of its discovery unless the engineering division manager approves an extension. In this case, an extension was granted to the end of this month because the design agency indicated informally that the newly postulated hazards would not lead to a weapon response. B&W has yet to receive a formal response from the design agency, but PXSO requested the PISA declaration in advance of this deadline to document why compensatory measures are not required and initiate an evaluation of the safety of the situation.

B&W presented a different unanalyzed hazard scenario that had the potential to affect the W78 HAR to the Board in November. As of last week, the authorization basis department had yet to determine whether the scenario was credible. Therefore, in this instance, the actions taken by B&W did not meet the aforementioned requirements for the processing of new information. B&W plans to declare this hazard a PISA this week.

Missed Electrical Equipment Evaluations: The recently completed contractor readiness assessment of B61 command disablement operations led to a pre-start finding to capture the fact that a piece of Category 2 electrical equipment had not been evaluated for its electrical threat potential during the subject operation. DOE Order 452.2D, *Nuclear Explosive Safety*, requires organizations responsible for nuclear explosive operations to verify that all equipment used in nuclear explosive areas be specifically approved for that operation. This is the second recurrence of this issue since April 2009 (see 12/11/09 and 4/24/09 reports), indicating the corrective actions from the first occurrence have been ineffective to date. B&W management is considering ways to prevent further recurrence of the issue.

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 January 8, 2010

W78 Operations: B&W recently encountered several problems while attempting to extract a W78 canned subassembly (CSA). The first stoppage resulted from a tooling issue. Technicians were pressurizing the sealing clamp that is used to regulate the motive force for the extraction when the clamp's rubber seal detached. Per protocol, operations were placed on hold. The tool was removed and repaired, and operations were restarted only to be stopped again when technicians were unable to extract the CSA using the maximum force specified in the procedure. Program personnel suspected excessive structural material was preventing the area below the CSA from becoming fully pressurized. Process engineering developed a recovery procedure to allow the technicians to remove the material that appeared to block the entrance to the CSA's housing. After two extraction attempts, and one procedure revision to adjust the implements that were used to remove the excess material, the CSA was successfully extracted.

Offsite Shipments: Recently, B&W Pantex shipped a CSA to B&W Y-12 with a serial number on the shipping label that did not match the serial number on the component. Immediate corrective actions included the cessation of offsite shipments from Pantex. Since that time, B&W Pantex management has lifted the restrictions on shipments of War Reserve Units, Joint Test Assemblies, Test Beds, Reservoirs, ALT Kits, and Diamond-stamped Handling Gear. This decision was based on a pre-standing requirement that the part and serial number of each item be independently verified by line personnel and the quality organization during the build or packaging process. For CSAs, analogous practices to independently verify the accuracy of shipping labels prior to packaging were not in place prior to this incident. Before re-authorizing shipments of CSAs, B&W Pantex management has requested that all previously packaged CSAs be verified. All other shipments will be evaluated individually until an extent of condition analysis and corrective actions (e.g., implementing requirements to formally verify the accuracy of component serial numbers and other identifiers on shipping labels) have been completed.

Technical Procedures: In a 15 October letter, the Board identified several potential improvements related to the development and implementation of technical procedures. The site reps. met with B&W and PXSO this week to discuss the status of actions that would address the areas identified in the letter. The process engineering and tooling departments are developing performance objectives that would require their personnel to spend a pre-specified amount of time (nominally one process evolution per year) observing the operations to which they have been assigned. These observations would take place when processes are functioning normally and are intended to bolster the lines of communication between the manufacturing and engineering divisions. In addition, B&W is finalizing an improvement initiative that was chartered to remove non-value added components of the procedure revision process while examining ways to prevent the word processing issues that arose last fall. One notable component of the initiative was a comprehensive review of the B&W Writer's Manual for Technical Procedures. The review team, which included a representative from the manufacturing division, has drafted a revision to the manual. Many of the changes are focused on simplifying formatting requirements that were found to have no human factors benefit. These simplifications should enhance the consistency and usability of procedures.

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 January 1, 2010

The site representatives were on leave this week.