

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 30, 2004

MEMORANDUM FOR: J. K. Fortenberry, Technical Director
FROM: W. White, Pantex Site Representative
SUBJECT: Pantex Plant Activity Report for Week Ending January 30, 2004

DNFSB Activity Summary: W. White was on site all week. T. Hunt and D. Kupferer were on site Monday through Thursday.

W62 Tooling Incident: On Monday, a tooling failure occurred during the process of removing a physics package from a W62 unit. The tooling failure was the result of overloading wire cables used in the extraction process, resulting in one frayed and two broken cables. Although the overloading of the cables did not present a direct safety issue, there is concern regarding communication between BWXT tooling engineering, the design laboratory, and the BWXT authorization basis (AB) group.

The operating parameters outlined in the work procedure, the result of a recent increase in allowable forces, permitted excessive force to be applied to the tooling. Based on experience from previous extraction operations on the W62, it was determined that an increase in the allowable force was needed to facilitate removing the physics package. BWXT requested that the design agency evaluate the weapon response at a greater applied axial force than initially used. The design agency provided documentation to BWXT that there was no weapon response at a total axial force of 7000 lbs. Tooling engineering, which requested that an evaluation be done at this force, intended to communicate to the design agency that the weapon response was for a scenario of 7000 lbs per lifting bolt (there are two lifting bolts on the extraction tool). The design agency, and subsequently the AB group, which provided operating parameters to the process engineers, interpreted the request to be for 7000 lbs total axial force and performed their evaluation and safety documentation development on this basis. At the time of the incident, the maximum axial force on the physics package addressed by authorization basis documents was 7000 lbs. The operating procedure was written to allow a torque on both fixture nuts of 30 ft-lbs, which the AB group understood to be the equivalent of 7000 lbs total axial force. The actual axial force on the physics package at the time of the tooling failure was estimated to be approximately 14,000 lbs. This is the design failure point of the tooling and is significantly less than the force that would cause damage to weapon components. [I, W3]

W78, W62, W76, W88, and W87 Tooling Concern: While walking down W88 operations in support of the hazard analysis task team, BWXT identified a potential failure mechanism in a lifting and rotating fixture used on the program. The fixture is designed to prevent rotation of the unit unless the unit is secured in the fixture with two cables attached to another piece of tooling. In this case, however, personnel managed to rotate the fixture even when the locking mechanisms appeared to be engaged.

The design used for the W88 fixture is similar to that used for lifting and rotating fixtures on the W62, W76, and W78 programs. The fixture is also scheduled for implementation on the W87 program when the enhanced transportation cart is implemented for that program. For the W78 program, which is currently undergoing readiness reviews to support startup of the seamless safety process, the locking mechanisms of the fixture are credited as safety features in specific scenarios in the hazard analysis.

On Thursday, BWXT reported the incident as an inadequacy in the safety analysis for the W78 program. Work involving this type of lifting fixture has been suspended on all affected programs. BWXT is currently working to determine the cause of the failure and appropriate corrective actions. [I, W3]