

Bruce Hamilton, Acting Chairman  
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**DEFENSE NUCLEAR FACILITIES  
SAFETY BOARD**

Washington, DC 20004-2901



September 24, 2018

The Honorable James Richard Perry  
Secretary of Energy  
U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-1000

Dear Secretary Perry:

The Defense Nuclear Facilities Safety Board identified safety issues with maintenance and inspection processes and procedures for structures, systems, and components at the Waste Isolation Pilot Plant. These safety issues, summarized in the enclosure, can degrade structures, systems, and components and result in hazards (e.g., fires) affecting onsite personnel. These issues are similar to ones identified in the Department of Energy's Accident Investigation Report as contributing to the fire event in 2014. The enclosure is provided for your information and use as the Department of Energy considers additional focused oversight and sustainable corrective actions in these areas.

Yours truly,

A handwritten signature in black ink that reads "Bruce Hamilton". The signature is written in a cursive style with a large initial "B".

Bruce Hamilton  
Acting Chairman

Enclosure

c: Mr. Joe Olencz

## Enclosure

***Maintenance and Inspection of Vehicles in the Underground***—Fires in the Waste Isolation Pilot Plant (WIPP) underground threaten the lives of workers and are identified in the *Waste Isolation Pilot Plant Documented Safety Analysis* (DSA), Revision 5b, as a potential generator of radiological hazards to onsite personnel. On February 5, 2014, a salt haul truck caught fire in the WIPP underground. Following the fire, the Department of Energy (DOE) appointed an Accident Investigation Board (AIB) to analyze the event. The DOE AIB report (*Accident Investigation Report, Underground Salt Haul Truck Fire at the Waste Isolation Pilot Plant, February, 5, 2014*) found “...the direct cause of this accident to be contact between flammable fluids (either hydraulic fluid or diesel fuel) and hot surfaces (most likely the catalytic converter) on the salt haul truck, which resulted in a fire that consumed the engine compartment and two front tires.” The DOE AIB conclusion highlights the importance of underground vehicle inspections and maintenance, and procedural compliance.

Reviews conducted by the Defense Nuclear Facilities Safety Board’s (Board) staff in 2016 and 2018 found deficiencies similar to those discussed in the AIB report. The AIB report, Conclusion 9, states: “NWP [Nuclear Waste Partnership, LLC] management has allowed less than acceptable rigor in the performance of equipment inspections, resulting in the operation of [underground] equipment in unacceptable condition.” Contrary to underground vehicle inspection procedures, the Board’s staff’s reviews identified (1) continuing operation of vehicles with dripping leaks of hydraulic fluid, engine oil, or fuel that, by procedure, need to be removed from service until repaired; (2) operator equipment inspections that either failed to identify vehicle leaks or, in the staff’s opinion, classified the leaks incorrectly; (3) vehicle logbooks that did not receive the required supervisory reviews; and (4) unapproved or outdated implementing procedures being used for vehicle inspections. The Board’s staff’s reviews also found that the current preventive maintenance schedules for infrequently used underground vehicles result in significant time intervals between major maintenance activities. The Board’s staff’s reviews provide evidence that weaknesses in equipment inspections and maintenance processes persist since release of the AIB report and additional DOE oversight and sustainable corrective actions are needed to reduce the likelihood of another fire event in the underground.

***Preventive Maintenance Procedures Implementing Technical Safety Requirements (TSR)***—Proper documentation and implementation of TSR steps are imperative to ensure WIPP personnel inspect and maintain safety significant structures, systems, and components (SSC) at a level that validates that the preventive and mitigative functions are not degraded. The Board’s staff identified a number of concerns with the flowdown of TSRs into preventive maintenance procedures. The governing document for technical procedures, which includes preventive maintenance procedures, is DOE Order 422.1, *Conduct of Operations*. Relevant requirements from the order include: (1) procedures incorporate appropriate information from applicable source documents, including design, safety basis, and vendor technical documents; (2) procedures are technically and administratively accurate, instructions and information are correct; and (3) procedures reflect human factors considerations such as highlighting important steps or information.

The March 2018 Board's staff review identified more than 40 TSR-related noncompliances with the WIPP DSA and/or WIPP *Work Control Document Writer's Guide*. Examples of noncompliances found in various preventive maintenance procedures and associated datasheets include: (1) TSR steps that are not [correctly] flowed down from the current revision of the DSA; (2) TSR steps that should be, but are not, identified as TSR steps in the procedure; (3) steps incorrectly identified as TSR steps; and (4) misidentified surveillance requirements. Improper documentation or execution of TSR steps could result in safety significant SSCs not operating as designed when called upon.

***Vendor-Recommended Maintenance***—The DOE AIB report identified the need to resolve deficiencies associated with the gaps between the maintenance protocol outlined in the vendors' operations and maintenance manuals and what was incorporated into WIPP's preventive maintenance and preoperational procedures, primarily those for underground, liquid-fueled mobile equipment. The Board's staff determined that WIPP has not formalized procedures and processes to ensure vendor-recommended maintenance is being incorporated into, or justifiably excluded from, preventive maintenance and preoperational procedures. The Board's staff also has found that WIPP has not validated current preventive maintenance procedures to ensure a technical justification is developed and documented for any deviations from the vendor recommendations. Routine monitoring, inspection, and maintenance of safety-related equipment recommended by the manufacturer are important activities that should be evaluated for incorporation into WIPP preventive maintenance procedures. The vendor-recommended preventive maintenance activities that are not included in the WIPP procedures could affect SSC performance.