

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 16, 2004

**MEMORANDUM FOR:** J. Kent Fortenberry, Technical Director  
J. J. McConnell, Deputy Technical Director  
**FROM:** R. T. Davis/ T. D. Burns  
**SUBJECT:** SRS Report for Week Ending January 16, 2004

**TRU Waste Activities:** During routine drum movement operations in E-Area, operators observed that one of the drums was bulging. Further investigation on the drum history indicated that it had been packaged by the HB-Line facility in 1982 with a qualitative “zero-inventory” assessment by the facility at that time. The drum was subsequently buried. When dug-out in 1998 it was vented and marked as containing a prohibited item for TRU disposal.

E-Area personnel decided to repackage the contents of this drum and remove the prohibited item. Repackaging requires an assay as a prerequisite, so the drum was taken to the assay facility (Hazard Category-3 with a inventory limit of 56 Plutonium-239 Equivalent Curies) and measured. The drum was found to contain 283 Plutonium-239 Equivalent Curies (primary contribution from ~8 g of Pu-238). In addition to having exceeded the inventory control in the Technical Safety Requirements, this drum had not been previously subject to venting and criticality controls commensurate with its high radio-nuclide inventory. Although this situation clearly represents operations outside of the safety envelope outlined in the Technical Safety Requirements, the facility has been resisting its classification as a Technical Safety Requirement violation.

A Potential Inadequacy in the Safety Analysis has been declared with regard to appropriateness of the Authorization Basis assumption that drums qualitatively determined by the generating facility to be “zero-inventory” contain no more than 20 Plutonium-239 Equivalent Curies. The remaining inventory of 324 “zero-inventory” drums have had hold tags placed on them to prevent any movements until a path forward can be established to re-assay them. If they cannot be demonstrated to be below the assay facility’s inventory limit, then additional safety analysis will be required to determine what additional controls are needed to perform the necessary measurements.

**TCON-Project:** While performing inspections of vendor supplied equipment to support start-up testing in Building 234-7H (the new reservoir conditioning and contaminated metalography facility), WSRC identified electrical code compliance issues with the Safety Significant Environmental Chamber to be used for thermal cycling of bare reservoirs. Since mission requirements preclude the use of secondary containers in this Environmental Chamber to mitigate gas leaks from the reservoir that could lead to an explosive atmosphere, the Environmental Chamber was designed to *National Electric Code Article 501, Class 1, Division 2* standards to minimize the potential for electrical sparking that could lead to an explosion. The specific code compliance issues involved improper grounding of Environmental Chamber ventilation fan motors and failure to enclose a non-qualified voltage regulating component in an atmospherically isolating electrical box.

An NCR has been issued and WSRC is currently developing a path forward to properly ground the fan motors and enclose the non-rated component. Physical repairs are scheduled for completion next week to support closing out the NCR by the end of this month. This incident emphasizes the importance of independently validating that vendor supplied equipment relevant to safety meets the appropriate design specifications.