

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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May 21, 2010

The Honorable Thomas P. D'Agostino
Administrator
National Nuclear Security Administration
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0701

Dear Mr. D'Agostino:

Proper categorization of facilities with hazardous material is essential to ensuring that hazards are comprehensively analyzed, consequences of postulated accidents are understood, and controls necessary to mitigate these consequences are identified and rigorously implemented. The Defense Nuclear Facilities Safety Board (Board) is concerned that the Hazard Category designation for the recently refurbished Sandia National Laboratories (SNL) Z machine may not correctly recognize the hazard of some experiments being carried out in that facility.

Carefully controlled experiments are being planned for SNL's Z machine that will vaporize gram quantities of plutonium. The Department of Energy (DOE) Standard 1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*, outlines a two-part methodology for hazard categorization of facilities. As detailed in the enclosed report, SNL's analysis relies upon the computed release fraction for plutonium that begins as a solid, as opposed to material that has been vaporized. SNL's analysis also relies incorrectly upon the vacuum system and the secondary containment for the Z machine to mitigate the release of plutonium, which consequently lowers the airborne release fraction appropriate for vaporized plutonium by several orders of magnitude. DOE Standard 1027-92 specifically states that the analysis of the unmitigated release should not consider control features that would prevent or mitigate a release.

It is noteworthy that the Board issued a letter in June 2006 regarding the need for supplemental guidance for DOE Standard 1027-92 that would have clarified the hazard categorization of Z machine based on the appropriate release fraction. DOE developed supplemental guidance for this standard in 2008, but it was never implemented. The Board believes that the issue documented in the enclosed report could have been avoided had DOE either implemented the supplemental guidance or revised DOE Standard 1027-92.

Therefore, pursuant to 42 U.S.C. § 2286b(d), the Board requests a briefing within 45 days of receipt of this letter that provides the technical justification for the current hazard categorization of the Z machine for plutonium isentropic compression experiments. The enclosed report prepared by the Board's staff provides additional detail on this issue.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter S. Winokur". The signature is stylized with a large initial "P" and a long, sweeping underline.

Peter S. Winokur, Ph.D.
Chairman

Enclosure

c: Mr. Glenn S. Podonsky
Ms. Patty Wagner
Mr. Andrew Wallo III