

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

October 4, 2024

TO: Timothy J. Dwyer, Technical Director
FROM: Sonia G. Thangavelu, Ph.D., Cognizant Engineer
SUBJECT: Nevada National Security Site (NNSS) Report for September 2024

DNFSB Staff Activity: During the week of September 2, 2024, the Vice Chair and Board's staff observed the Goldenrod annual emergency exercise at the Device Assembly Facility (DAF); performed walkdowns at NNSS facilities; met with senior Mission Support and Test Services, LLC (MSTS) and Nevada Field Office (NFO) leadership; and also met with the Nevada Site Specific Advisory Board.

DAF Linear Accelerator (LINAC) Equivalency Request: In July 2024, MSTS submitted an equivalency request in accordance with DOE Order 251.1D Appendix E for NFO approval. Instead of managing safe accelerator operations under DOE Order 420.2D, the request would allow using DOE Standard 3009-94 CN-3 (existing safe harbor methodology) for LINAC operations. MSTS justified the request by noting that the 10 CFR 830 compliant DAF safety basis and unreviewed safety question (USQ) process are comparable and analogous to the accelerator safety assessment document and unreviewed safety issue process. MSTS concluded the 10 CFR 830 requirements provide an adequate approach to safely protect the public and workers during LINAC operations. MSTS used a similar approach for the safety design basis documents for Scorpius operations at the Principal Underground for Subcritical Experimentation.

Positive USQ Determination (USQD) for Target Assembly (TA) at Joint Actinide Shock Physics Experimental Research (JASPER) Facility: The TA is a leak tested enclosure that provides confinement of a target material and is maintained under high vacuum to support gas gun assembly experiments at JASPER. The high vacuum in the TA prevents corrosion or oxidation that could affect the target sample. The TA is sometimes backfilled to atmospheric pressure with an inert gas following an experiment or if it needs to be transported back to DAF for further analysis. On August 8, 2024, MSTS discovered that the TA high vacuum and backfill activities and associated hazards (e.g., negative pressure loss) are not described nor analyzed in the safety basis. MSTS entered the potential inadequacy of the safety analysis process and declared a positive USQD. MSTS submitted an evaluation of the safety of the situation (ESS) and change notice to the JASPER safety basis for NFO approval. MSTS also issued a timely order (i.e., an operational restriction) to prohibit receipt of an alternate material form to the JASPER facility. The ESS did not identify compensatory measures; however, the change notice incorporated the following updates to the safety basis: added process descriptions of the TA vacuum and backfill processes; included cryogenic hazards in the hazard identification list due to use of new vacuum system components and a liquid nitrogen cold trap; evaluated negative pressure effects and TA over-pressurization in the hazards analysis; and suspended alternate material form operations. On September 11, 2024, NFO issued a safety evaluation report and approved the change notice with one condition of approval and an issue for the next safety basis update. NFO required the timely order to remain in effect until a complete evaluation of TA vacuum and backfill activities is conducted for the alternate material form, and the material-at-risk inventory that includes this form as a JASPER target is removed from the technical surveillance requirements until the hazard analysis is completed.