

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 5, 2024

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

DNFSB Staff Activity: The Board's staff conducted no onsite activities in June.

Positive Unreviewed Safety Question (USQ) Determination for Seismic Evaluation at Device Assembly Facility (DAF). The DAF building structures are safety class components with performance criteria to meet seismic design category 3 (SDC-3) requirements for preventing and mitigating seismically induced accidents. In 2007, Mission Support and Test Services, LLC (MSTS) submitted a probabilistic seismic hazard analysis (PSHA), including the soil structure interaction (SSI) analysis to the Nevada Field Office (NFO); these efforts halted due to a software issue. In 2017, MSTS stated the need to update the DAF assessment per the U.S. Department of Energy (DOE) Order 420.1C – *Facility Safety* requiring reevaluation of the seismic hazard assessment every 10 years. MSTS recommended using the 2007 PSHA for the restart of the SSI analysis. NFO agreed with MSTS recommendation and modified the 2007 input earthquake design spectra by slightly increasing the peak ground acceleration spectral values. NFO approved the modified 2007 PSHA results for use as the 2017 PSHA results.

In March 2024, the MSTS subcontractor submitted the SSI analysis to MSTS. The analysis contained structural evaluation results and structural demand calculations not previously evaluated by past seismic analyses, including demand-to-capacity (D/C) ratios for structural components within the structural load path. The D/C ratio is used to indicate if a component meets the SDC-3 performance goal by defining acceptable performance as D/C less than or equal to 1. The analysis concludes six DAF buildings exceed the D/C ratio of 1. MSTS concluded the six building structures may not perform their safety function, meet functional requirements, or meet SDC-3 performance goals as described in the safety basis, and could damage other safety class components (e.g., fire suppression system) in an accident scenario. MSTS entered the potential inadequacy in the safety analysis process and declared a positive USQ determination. On May 6, 2024, MSTS submitted the evaluation of the safety of the situation (ESS) to NFO for approval. The ESS identified a commitment to update the safety basis with the new SSI analysis and to develop a recovery plan to restore the seismic qualification of the impacted buildings and systems. NFO is currently developing the safety review letter.

Change Notice to DAF Safety Basis. On May 23, 2024, MSTS resubmitted a change notice to the DAF safety basis for the Enhanced Staging Project (ESP). The change notice scope restricts high explosive materials in the materials handling area building that will be used to support the ESP. NFO is currently developing the safety evaluation report.

Classification Change to Joint Actinide Shock Physics Experimental Research (JASPER) and Radioactive Waste Management Complex (RWMC) Safety Bases. On May 21, 2024, and June 6, 2024, respectively, MSTS submitted two letters to NFO formally changing the classification markings of the JASPER and RWMC safety bases. The changes satisfy DOE Order 471.1 – *Controlled Unclassified Information* requirements.