

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

November 5, 2021

TO: Christopher J. Roscetti, Technical Director
FROM: Austin R. Powers, Cognizant Engineer
SUBJECT: Nevada National Security Site (NNSS) Report for October 2021

DNFSB Staff Activity: The staff conducted no onsite activities at NNSS during October.

Suspect Bolts at the Joint Actinide Shock Physics Experimental Research (JASPER)

Facility: Lawrence Livermore National Laboratory (LLNL) personnel at JASPER identified suspect bolts on the credited primary target chamber (PTC), which provides confinement to the radiological material after an experiment. LLNL personnel discovered the suspect bolts on a mounting bracket for a valve that is located on the line to the PTC's credited filter. LLNL personnel were removing the bolts on the mounting bracket to inspect the internals of the valve. During disassembly, the nuts seized on the bolts. LLNL personnel applied additional torque to remove the nuts, which caused the bolts to shear. Mission Support and Test Services, LLC (MSTS), evaluated the suspect bolts as part of the nonconformance report process. The evaluation included an analysis of attributes based on background information for the bolts, analysis of attributes based on common suspect/counterfeit items and their symptoms, visual inspection of the bolts, and a material analysis using an alloy analyzer. From the evaluation, MSTS concluded that the bolts did not meet the criteria for a counterfeit item. This conclusion was based on the bolts having the appropriate markings per industry standards and the confirmation that the bolts were the expected stainless-steel alloy. MSTS found that the nuts that seized had the same stamp marking. MSTS also found that the threads on the bolts were not lubricated as recommended by the manufacturer prior to installation. LLNL personnel have sent the bolts back to LLNL for nondestructive testing (e.g., liquid dye penetrant testing, ultrasound testing, and radiography). LLNL personnel will use the results of these tests to determine the appropriate follow-on actions.

Enhanced Capabilities for Subcritical Experiments (ECSE) Project: The ECSE project consists of multiple projects that constitute major modifications to the U1a Complex. MSTS is following Department of Energy (DOE) Order 420.1C, *Facility Safety*, for this project, which requires the safety analysis and supporting design to be developed and integrated in accordance with DOE Standard 1189-2016, *Integration of Safety into the Design Process*. As part of the project, MSTS will install a new single-axis multi-pulse radiography system and a Zero Room with infrastructure and support systems similar to the existing Zero Room. In October, MSTS submitted the final preliminary documented safety analysis (PDSA) for this portion of the project to the Nevada Field Office (NFO) for review and approval. MSTS developed the PDSA using the methodology, criteria, and guidance in DOE Standard 3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*. In the submittal letter, MSTS informed NFO that a future revision of the PDSA will address the final design for the fire extinguishing system, active confinement ventilation strategy after experiment execution, and an increase in high explosive limits. NFO plans to complete its review of the PDSA in January 2022.