

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 7, 2021

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

**DNFSB Staff Activity:** During April, the Board's staff conducted a teleconference review with personnel from Mission Support and Test Services, LLC (MSTS), a subcontractor to MSTS, and the Nevada Field Office. The review focused on the plans for conducting the soil-structure interaction analysis for the Device Assembly Facility. The Board's staff also conducted a teleconference with the site to discuss the Board's staff team's observations from their review of using an alternative location for the co-located worker when analyzing explosion scenarios at the U1a Complex. The Board's staff conducted no onsite activities during April.

**U1a Complex Seismic Reduction Factor:** MSTS is currently working on two major modification projects to the U1a Complex, the enhanced capabilities for subcritical experiments project (see NNSS Monthly Report for February 2019 for additional details) and the U1a.03 test bed project (see NNSS Monthly Report for March 2021 for additional details). Both projects are applying the design requirements in Department of Energy (DOE) Order 420.1C, *Facility Safety*. For natural phenomena hazards, which include seismic hazards, DOE Order 420.1C requires major modifications to be developed in accordance with the applicable requirements and criteria contained in DOE Standard 1020-2016, *Natural Phenomena Hazards Analysis and Design Criteria for DOE Facilities*. Based on the safety analyses for these projects, MSTS identified underground seismic-related controls that need to meet seismic design category (SDC)-2 criteria. DOE Standard 1020-2016 requires SDC-2 controls to be designed to the criteria of the 2015 International Building Code (IBC-2015). However, MSTS notes that the IBC-2015 seismic design criteria are applicable for the design of new controls at the surface and that the seismic ground motions are reduced at the underground elevation. As a result, MSTS developed a report that provides a technical justification for reducing the seismic hazard underground at the U1a Complex. In the report, MSTS identifies relevant external studies and several site-specific reports and data that support a reduction in the underground seismic ground motions. MSTS had the technical justification effort peer reviewed. The independent peer review team agreed with the reduction factor and performed several supplemental evaluations, which provide additional confidence. MSTS plans to apply the reduction to the IBC-2015 seismic design criteria when designing the seismic-related controls that will be located underground at the U1a Complex.

**Radioactive Waste Facilities (RWF) Explosion-Proof Spheres:** As discussed in the NNSS Monthly Report for March 2021, MSTS performed nonintrusive characterization for the two explosion-proof spheres that are staged in the Transuranic Waste Pad Cover Building at the RWF. MSTS performed these tests to determine if there is a vent path for the spheres, which would ensure that any potential hydrogen generated in the spheres would not be retained. From these tests, MSTS found that there are multiple valves shown to be open or partially open. In addition, MSTS found no removable contamination on the exterior of the spheres and did not detect any explosive gases. However, MSTS is still investigating the possibility of the filters being plugged, which would allow the spheres to be capable of holding an internal pressure. MSTS will not ship the spheres offsite until the potential concern is resolved.