

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 1, 2019

TO: Christopher J. Roscetti, Technical Director
FROM: Austin R. Powers, Cognizant Engineer
SUBJECT: Nevada National Security Site (NNSS) Report for February 2019

DNFSB Staff Activity: A. Powers, D. Andersen, D. Bullen, and R. Oberreuter were on site during the week of February 4 to conduct routine oversight of NNSS as part of the quarterly cognizant engineer site visit. During the visit, the staff team conducted walk downs at the various NNSS defense nuclear facilities, discussed revisions to safety basis documents, and discussed ongoing and planned infrastructure improvement projects at each facility.

U1a Complex Experiment and Contamination Event: During February, Los Alamos National Laboratory and Lawrence Livermore National Laboratory (LLNL) executed an experiment at the U1a Complex. This was LLNL's first experiment at U1a since 2003. Preliminary results indicate high-quality data return. However, when re-entering the Zero Room, the radiological control technicians detected contamination near the confinement vessel. The confinement vessel is currently isolated in the Zero Room (i.e., between two steel plugs), which is credited to confine radioactive material if the confinement vessel is breached. The National Nuclear Security Administration Nevada Field Office informed the Defense Nuclear Facilities Safety Board's staff that it appears that the contamination is only local to the confinement vessel, given that the continuous air monitoring system did not detect any contamination. The vessel has been vented and is currently under vacuum, which is expected to prevent any further release of contamination. Mission Support and Test Services, LLC (MSTS) personnel are periodically monitoring the pressure of the confinement vessel to ensure it is still under vacuum. MSTS and the laboratories are developing a plan to decontaminate the Zero Room and are working to determine the cause of the contamination release.

Enhanced Capabilities for Subcritical Experiments (ECSE) Project. During February, MSTS submitted a revised Safety Design Strategy (SDS) for the ECSE project at the U1a Complex. The ECSE project is a major modification to U1a that will follow the safety-in-design approach described in Department of Energy (DOE) Standard 1189-2016, *Integration of Safety into the Design Process*. The project includes installing a new single axis multi-pulse radiography system, reactivity measurement system, and Zero Room with infrastructure and support systems similar to the current Zero Room. MSTS plans to construct the ECSE project in a drift with no current mission. The project will not have an impact on the current experimental operational area. The revised SDS states that the primary hazards associated with the proposed new activities are radioactive material, high explosives, high-energy radiography, and operation of a neutron source. The amount of special nuclear material and high explosives, the confinement strategy (confinement vessel in a Zero Room sealed with two plugs), and the method to convey the experimental package to the new Zero Room will be the same as or similar to the current experimental operational area. To account for the new project, MSTS will revise the current safety basis in accordance with DOE Standard 3009-2014, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*. The safety basis will transition from an experimental-based safety basis (i.e., updated for each experiment) to a nuclear facility safety basis.