

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 6, 2020

TO: Christopher J. Roscetti, Technical Director
FROM: Austin R. Powers, Cognizant Engineer
SUBJECT: Nevada National Security Site (NNSS) Report for February 2020

DNFSB Staff Activity: A. Powers visited the site during the week of February 3rd to perform walk downs at the various defense nuclear facilities, observe an emergency drill at the Joint Actinide Shock Physics Experimental Research Facility, and discuss the status of updating safety basis documents. A. Powers and D. Bullen visited the site during the week of February 10th to observe the contractor readiness assessment (CRA) for downdraft table operations.

Downdraft Table Restart Status: During February, Mission Support and Test Services, LLC (MSTS), and Lawrence Livermore National Laboratory (LLNL) personnel conducted a joint CRA for the downdraft table in the Device Assembly Facility (DAF). The CRA team included eight members selected by the team leader based on their relevant experience in management; nuclear operations; radiation protection; environment, health, and safety; fire protection engineering; training; criticality safety; and conduct of operations. The CRA team reviewed documents (e.g., procedures, evaluations, plans); completed interviews with DAF management, DAF engineers, and LLNL personnel; and observed demonstrations of a majority of the downdraft table operations. The CRA team identified eight pre-start findings and no post-start findings. The pre-start findings include required modifications not being completed, incorrect functional classification for downdraft table controls in the DAF master equipment list, and a technical error in a criticality safety evaluation. LLNL and MSTS personnel will address the pre-start findings in the CRA report prior to the federal readiness assessment, which is scheduled for April.

U1a Complex Contamination Event: As discussed in the NNSS Monthly Report for November 2019, Los Alamos National Laboratory (LANL) performed a root cause analysis for the confinement vessel leakage during a February 2019 subcritical experiment in the U1a Complex. LANL has completed the final report for this analysis. LANL found that the dynamic pressures from the experiment temporarily displaced a radiography exit port and its cover assembly on the confinement vessel. LANL determined this to be the direct cause for the confinement vessel leaking a small amount of radioactive material. In addition, LANL found several contributing causes for the event, which include: MSTS and LANL personnel responsible for procuring the confinement vessel were not trained and qualified as subcontract technical representatives, which resulted in less than adequate procurement and quality oversight of the manufacturing process; the vendor responsible for building the confinement vessel did not have prior experience manufacturing vessel weldments to the appropriate American Society of Mechanical Engineers requirements; the radiographic exit cover and bolt/washer torque were not optimally designed; and the o-ring seals may not have been adequately exercised for proper seating. As a result of the analysis, LANL made several improvements for the confinement vessel, such as adding additional o-rings to radiographic ports and covers, adding material to radiographic covers to increase strength and stiffness, and improving the bolt surface finish for all radiographic ports. For new confinement vessels that are procured, LANL plans to increase the bolt diameter for all ports and improve the weld joint designs.