

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

January 7, 2022

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

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

Joint Actinide Shock Physics Experimental Research (JASPER) Facility Safety Basis

Update: In late October, the Nevada Field Office (NFO) approved a change notice to the JASPER safety basis. This change notice supports a new configuration of the gas gun when performing experiments with actinide material. The original gas gun configuration uses a “two-stage” approach. In the first stage, JASPER personnel ignite a propellant to drive a piston down the pump tube. As the piston travels down the pump tube, the gas inside the tube compresses. Once a specified pressure is exceeded, a rupture valve at the end of the pump tube opens to the connecting launch tube (i.e., the second stage of the gas gun). The high pressure from the pump tube propels a projectile placed at the beginning of the launch tube down the tube at supersonic velocities into a target. The new configuration will not use the gun propellant breech and pump tube for experiments. Instead, JASPER personnel will connect compressed gas cylinders to the launch tube. The high pressure from the gas cylinders will propel the projectile down the tube and into the target. This new configuration allows operating the gas gun at lower velocity ranges.

In the change notice to the JASPER safety basis, Mission Support and Test Services, LLC (MSTS), did not identify any new facility-specific hazards or additional safety controls associated with this configuration. However, MSTS clarified whether or how certain credited controls were needed for this new configuration (i.e., gas delivery control, gas gun, and vacuum ventilation system). MSTS also clarified the boundary of the credited secondary confinement chamber for using the one-stage operation approach. From its review of the change notice, NFO did not identify any conditions of approval for the change notice or issues that need to be addressed in the next annual update.

National Criticality Experiments Research Center (NCERC) Implementation Verification

Review (IVR): As discussed in the NNSS Monthly Report for August 2021, NFO approved a change notice to the NCERC safety basis. The change notice adds three new critical assembly modes to the NCERC technical safety requirements document. The new modes allow NCERC personnel to optimize the necessary safety controls based on operational states of the four critical assembly machines and hand stacking activities. In late September, MSTS completed the IVR, which is conducted to confirm the proper implementation of new or revised safety basis controls, for this change notice. In the final report documenting the IVR, MSTS identified one post-implementation finding related to documentation not identifying the crew chief as the person-in-charge. MSTS verified that all the controls, assumptions, and conditions identified in the change notice were satisfactorily implemented.