

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

February 3, 2017

TO: Steven A. Stokes, Technical Director
FROM: Austin R. Powers, Cognizant Engineer
SUBJECT: Nevada National Security Site (NNSS) Report for January 2017

DNFSB Staff Activity: K. Deutsch and A. Powers conducted a teleconference with the Nevada Field Office (NFO), National Security Technologies, LLC (NSTec), and Los Alamos National Laboratory (LANL) personnel on Technical Safety Requirements and software for the critical assembly machines at the National Criticality Experiments Research Center (NCERC).

KiloPower Reactor Demonstration (KRD): NSTec and LANL personnel are currently in the process of developing a safety basis addendum for the NCERC safety basis to address the experiments that will be conducted as part of the KRD, also known as Kilowatt Reactor Using Stirling Technology (KRUSTY), at NCERC. The purpose of the experiments is to assemble and evaluate the performance of a reactor that is similar to what would be used by the National Aeronautics and Space Administration (NASA) on a deep space exploration mission. The reactor will be designed with heat pipes attached to Stirling engines, which can demonstrate how electricity can be generated when extracting energy from a nuclear generator driven heat source. The design will also include the use of a vacuum chamber to simulate some parameters of the operating environment that is expected in space. For these sets of experiments, the reactor will be assembled on the Comet critical assembly machine.

NFO is expecting the 90 percent complete safety basis addendum to be finished and submitted during the month of March. Based on previous discussions with NSTec and LANL personnel, both the NNSS cognizant engineer and NFO do not anticipate any major changes to the current control set within NCERC. The bounding accidents for the experiments, which all include excess reactivity insertion, were determined to have low consequences to the workers and the public. Also, the control set needed to mitigate the accidents associated to the experiments are already credited in the approved NCERC safety basis.

Device Assembly Facility (DAF) Fire Suppression System (FSS) Improvement Project:

During the month of January, NSTec continued to make improvements to the FSS in DAF. NSTec construction has completed the construction activities that address the lead-in line issue for one building and the sprinkler deficiencies for a separate building. NSTec facility personnel declared both of these buildings to be operable during the month of January. NSTec construction has also begun construction on another building during the month of January, where it will address both the lead-in line and sprinkler deficiencies for this building. NSTec is projecting the completion of all construction activities and the return of this building to operable status by April 2017. NSTec is also planning to start construction activities for yet another building during the month of February. The NNSS cognizant engineer will continue to follow the progress of the improvements made to the DAF FSS.

Joint Actinide Shock Physics Experiment Research (JASPER): JASPER conducted Actinide Shot 147 successfully, which returned 100% data. The experiment was executed in a safe manner with no safety issues to report.