DEFENSE NUCLEAR FACILITIES SAFETY BOARD

May 6, 2016

TO: Steven A. Stokes, Technical Director
FROM: John R. Mercier, Cognizant Engineer
SUBJECT: Sandia National Laboratories Report for April 2016

Staff Activity at Sandia National Laboratories (SNL). On 25-26 April, 2016, the Defense Nuclear Facilities Safety Board's (Board) Cognizant Engineer–with oversight responsibilities for Sandia National Laboratories–conducted a walkdown of a Hazard Category 2 nuclear facility, met with the Kirtland Air Force Base (KAFB) Fire Chief to gain insight in KAFB emergency response support to SNL nuclear facilities, met with SNL quality assurance staff to learn how their issues tracking system is implemented, and met with SNL safety basis engineers to continue to gain insight on SNL implementation of requirements flowed down from Title 10, Code of Federal Regulations, Part 830 (10 CFR 830), *Nuclear Safety Management*.

Sandia Pulse Reactor Facility (SPRF)–Fire Safety. The KAFB Fire Chief is engaged with the Department of Energy (DOE) Sandia Field Office (SFO) in updating the support agreement his department provides to SNL. The Fire Chief confirmed that his subordinate leaders are trained in managing fires where the introduction of water can create the potential for a criticality event. The Fire Chief is scheduled for a walkdown of Technical Area V in May, 2016, for a firsthand look at SNL nuclear facilities. With regard to the lack of engineered fire suppression systems at the SPRF, both SNL and the DOE are continuing to develop options leading to a path forward to improve the fire protection envelop at the SPRF.

SPRF–Criticality Safety. The Board Cognizant Engineer observed that certain reactor core loadings during shutdown are unanalyzed for criticality upon the introduction of a water deluge such as from a firehose. The SPRF facility supervisor confirmed that there could be certain core configurations with control and safety rods inserted that could still go critical with the introduction of water. Sandia studied the criticality concern and determined that aspects of the credited controls need to be clarified in the Safety Analysis Report (SAR) to explicitly address a firefighting scenario. During the Board's Cognizant Engineer's visit, the SNL safety basis staff committed to address the firefighting scenario in the SAR Hazard Analysis and include preventive controls (e.g., to prevent a criticality event during an emergency response).

Annular Core Research Reactor Facility (ACRRF)—Plume Modeling. The Board Cognizant Engineer observed that SNL safety basis engineers correctly validate the WinMACCS plume modeling software used to estimate downwind doses at the facility boundary with hand calculations that utilize conservative wind stability, wind speed, and ground roughness parameters. The WinMACCS software is much less capable in predicting near-field doses such as those calculated for collocated workers at 100 meters.

Technical Area V—Issues Management. The quality assurance staff supporting Technical Area V (TA-V) developed a custom issues tracking and reporting system using commercial Enterprise Bridge (eB) information management software. The eB system receives input from TA-V staff and can draw information from the SNL corporate issues management system. Currently, issues input into other systems used by fire protection and radiation safety staffs are tracked separately by SNL staff not assigned to TA-V.