



Department of Energy

Washington, DC 20585

August 23, 2023

The Honorable Joyce L. Connery
Chair
Defense Nuclear Facilities Safety Board
625 Indiana Avenue NW, Suite 700
Washington, DC 20004

Dear Chair Connery:

Thank you for your letter dated April 5, 2023, regarding the Documented Safety Analysis (DSA)/Technical Safety Requirements (TSR) for the Savannah River National Laboratory (SRNL). The Department of Energy's (DOE) recent actions to establish an independent Management and Operations contract for SRNL necessitate consideration of nuclear safety with a view to long-term viability of the Laboratory and its enduring mission. This includes continuous improvement of the hazard control selections and methodologies that will ultimately lead to compliance with the latest revisions of DOE's Standards associated with nuclear safety.

DOE acknowledges the conclusions of your staff's report, and we are fundamentally aligned with your concerns. As you noted, DOE and its contractors have been working for several years to upgrade and modernize the SRNL safety basis. We have taken steps to improve nuclear safety documentation and implement a DSA/TSR that advances expectations identified in DOE Orders and Standards. This includes a refined control suite that provides reasonable assurance SRNL can be operated safely in a manner that adequately protects workers, the public and the environment. The outcome of our continuing efforts resulted in approval of a substantially improved DSA/TSR, Revision 2 in December of 2021. However, the emerging need to incorporate controls to accommodate the evolving Mk-18 material recovery efforts for the National Nuclear Security Administration, coupled with consideration of input from your staff following their review of the DSA/TSR, resulted in DOE Savannah River management's decision to place implementation efforts on hold so that important changes could be made to address those concerns in Revision 3 of the DSA/TSR.

The enclosed response provides details of the actions and timelines to address the concerns outlined in the Staff Report documenting your review of the SRNL Safety Basis. And, in accordance with your reporting request, we have coordinated a briefing with the Board to discuss this response.

If you have any questions, please contact me or Mr. Michael D. Budney, Manager, Savannah River Operations Office, at (803) 952-7243.

Sincerely,

A handwritten signature in blue ink, appearing to read "William I. White". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

William I. White
Senior Advisor for Environmental Management

Enclosure

cc: Michael Budney, SR
Gregory Sosson, CTA

Actions and Timelines for the Savannah River National Laboratory Documented Safety Analysis/Technical Safety Requirements

Summary

A draft Revision 3 of the Documented Safety Analysis (DSA)/Technical Safety Requirements (TSR) has been provided to the Department of Energy (DOE) by the Savannah River National Laboratory (SRNL) operating contractor. It incorporates changes that address three of the concerns identified in the Defense Nuclear Facilities Safety Board (DNFSB) report, “Savannah River National Laboratory Safety Basis Review,” regarding designation of Specific Administrative Controls (SACs), Safety Significant Boundary of the Fire Water Supply and Sprinkler System, and Material at Risk (MAR) Undergoing “Temporary Confinement Changes.” Other planned improvements will augment fire safety and the National Fire Protection Association (NFPA)-compliant Fire Water Supply System with compensatory measures to assure the supported safety-significant sprinkler system can perform its safety function when called upon. The fourth concern described in the Board’s staff report involving Safety Integrity Level Determinations for Safety Instrumented Systems is being addressed and will be incorporated in the annual update of the DSA/TSR scheduled for fiscal year (FY) 2025.

Background

DOE directed the Laboratory contractor to assess Administrative Controls (ACs) associated with Revision 3 of the DSA/TSR and any future revisions utilizing DOE-STD-1186-2016, *Specific Administrative Controls*. DOE also directed the contractor to take several actions aimed at assuring the fire water system meets DOE’s expectations outlined in the latest revisions of the Orders and Standards applicable to facility safety.

Discussion

Designation of Specific Administrative Controls

DOE’s review of the issue concluded the failure to identify SACs versus ACs stemmed from a 2017 interpretation of SAC determinations that was incorporated into the site’s TSR Methodology Manual. The manual was utilized for DSA/TSR Revision 2 to determine whether controls should be designated as ACs or SACs. DOE determined the Methodology Manual misinterpreted key criteria of DOE-STD-1186-2004. To remedy the issue, the Savannah River National Laboratory (SRNL) contractor was directed to review the ACs utilizing DOE-STD-1186-2016. As a result, 12 elements of the Administrative Control Programs were identified as meeting the criteria established in the standard and have been converted to SACs in the Draft Revision 3 of the DSA/TSR. DOE has determined that the development and implementation of these SACs address the concerns identified in the Staff Report. DSA/TSR Revision 3 is scheduled to be implemented in March 2024.

Safety Significant Boundary of the Fire Water Supply and Sprinkler System

DOE reviewed its approach to assuring the fire water system can meet its intended safety function when called upon. Areas of improvements were identified that will be implemented with Revision 3 DSA/TSR scheduled for March 2024. The improvements detailed below will provide greater assurance the system will operate as intended. In addition, a backfit analysis of the fire water supply system will be conducted to evaluate and document the ability of the system to perform its intended safety function. Any additional measures and improvements identified as a result of the analysis will be evaluated for incorporation in the annual update of the DSA/TSR scheduled for FY 2025 or planned for implementation as soon as practicable.

- The DSA/TSR will be amended to include the appropriate TSR integration requirements with Savannah River Nuclear Solutions Site Services (Site Services), which owns and maintains the fire water supply system outside the SRNL Limited Area fence.
- The Inter-Contractor Agreement with Site Services will be modified to specifically identify the parameters affecting operability of the fire water system that are tied to the TSRs and the actions required by Site Services personnel when those parameters are compromised. Modifications will include identification of the appropriate procurement processes and levels that assure only listed or approved equipment and components are purchased and installed in the system. If necessary, actions will include modifications to the Site's Second Quarter Fire Protection Manual to assure General Service fire water systems are inspected and maintained in accordance with applicable NFPA requirements (e.g., NFPA 25 2017 edition).
- SRNL will establish an independent set of confirmatory rounds to be performed by its operators for inspection of the key fire water system components associated with the fire water pumps, tank, and support equipment. These rounds will be performed once per shift to give operations supervision direct evidence of system conditions that may affect operability.
- The pressure surveillance tests included in the DSA/TSR give reasonable assurance that the fire water supply system can provide necessary pressure per the hydraulic calculations. The flow and functional test surveillances included in the DSA/TSR provide reasonable assurance that the fire water supply system will convey sufficient flow without obstructions to meet functional requirements when called upon.
- The five-year flow test of the fire water supply system at the nearest fire hydrant within the SRNL limited area, an NFPA requirement, will be converted to an annual TSR surveillance in Revision 3 of the DSA/TSR. This test will provide additional empirical data related to system flow and the ability of the supply system pumps to meet their functional requirements.

- Because the supply system underground piping is 70 years old, DOE anticipates the piping will require augmented maintenance and inspection to monitor reliability. DOE will investigate methods to assess the integrity of the existing piping, to the extent practicable, while monitoring pipe failures to better predict when piping will need to be replaced.

MAR Undergoing “Temporary Confinement Changes”

DOE acknowledges the Board’s concerns regarding temporary confinement changes. The Department directed the contractor to strengthen the AC associated with temporary confinement changes contained in section 5.7.2.22, *Inventory Control Program* of the DSA/TSR. The changes were incorporated in the draft Revision 3 scheduled for implementation in March 2024 and are supported by time-at-risk evaluation. While the changes strengthen the controls, they do not limit the number of items that can be removed from a safe. Because of the manner in which some materials are packaged, a limiting number is impractical for implementation with Revision 3 DSA/TSR. DOE intends to review the effectiveness of the strengthened controls and to consider if items can be packaged differently to allow limits on the number of removed items. If additional controls are warranted, they will be implemented with the annual update of the DSA/TSR scheduled for FY 2025.

Safety Integrity Level Calculations

DOE agrees that Safety Integrity Levels (SILs) were assigned without the contractor utilizing the appropriate methodology. DOE’s contractor hired a subject matter expert to perform Layer of Protection Analysis in preparation for improving SIL calculations in the annual update of the DSA/TSR scheduled for FY 2025.