

Joyce L. Connery, Chair  
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## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Washington, DC 20004-2901



August 3, 2023

The Honorable Jennifer M. Granholm  
Secretary of Energy  
US Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-1000

Dear Secretary Granholm:

As part of its statutory role, the Defense Nuclear Facilities Safety Board (Board) reviews the design of new Department of Energy (DOE) defense nuclear facilities before and during their construction to ensure adequate protection of public and worker health and safety and to provide input early in the process. The Board has been reviewing the design of the Savannah River Plutonium Processing Facility (SRPPF)—a project in preliminary design at the Savannah River Site. The Board and its staff have interacted with project personnel and corresponded with DOE multiple times regarding concerns about the proposed safety control set for protecting facility workers as detailed in the attachment to this letter. The whole Board traveled to the site to better understand the position of the project on this matter. After hearing directly from the project, the Board remains concerned that the proposed safety control set may not adequately protect facility workers.

Gloveboxes in SRPPF will stage and process kilogram quantities of highly hazardous weapons-grade plutonium. Inhalation of small quantities results in large radiological doses. Some forms of this material will be pyrophoric, meaning it can readily ignite upon exposure to air and immediately begin releasing aerosolized plutonium. In the past, pyrophoric behavior of plutonium was implicated in major fires at DOE's Rocky Flats Plant. Other forms of weapons-grade plutonium that will be staged and processed in gloveboxes in SRPPF include plutonium oxide, which is dispersible and readily aerosolizes when spilled. Multiple scenarios can result in significant radiological exposure to the facility worker. DOE safety standards require that safety significant controls shall be selected for cases where significant radiological exposure to a facility worker may occur.

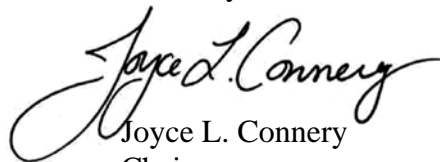
On May 11, 2023, project personnel briefed the Board on their position that additional safety controls are not required. Project personnel assert facility workers can use their senses to detect accidents such as a glovebox spill or fire and exit the area before receiving significant radiological exposure. Using this assumption of worker self-protection, project personnel avoided designating safety significant controls, such as gloveboxes, glovebox ventilation, continuous air monitors, and glovebox fire controls, that other DOE plutonium processing facilities have traditionally designated. The controls mentioned above are part of the existing

design of SRPPF, but they are not currently classified as safety significant. As a result, they lack the increased reliability of designated safety controls needed to protect the worker.

The project's position may not be shared among all offices in DOE. For example, in a December 2021 review, the DOE Office of Enterprise Assessments stated that it remains "concerned that the functional classification of [structures, systems, and components] currently in the conceptual design may not be adequate to ensure worker safety."

While the Board's letter dated January 24, 2022, provided eight safety observations, the Board is focusing on facility worker protection now because DOE is preparing to move forward with the procurement and fabrication of gloveboxes for the project. Gloveboxes and their interfacing systems are among the options that DOE could consider as safety controls for protecting the facility worker. The Board wishes to understand DOE's position on this safety issue before the project makes glovebox procurement decisions and to avoid suggesting untimely safety control changes to the design. Consequently, pursuant to 42 United States Code §2286b(d), the Board requests a written report and briefing in 45 days providing DOE's position on the adequacy of the safety strategy for facility worker protection, focusing on impacts to long-lead procurements, such as glovebox systems.

Sincerely,



Joyce L. Connery  
Chair

Attachment

c: Mr. Joe Olencz

## ATTACHMENT

### **Timeline of Defense Nuclear Facilities Safety Board Interactions and Correspondence Involving Design of the Savannah River Plutonium Processing Facility**

- January 24, 2022: The Defense Nuclear Facilities Safety Board (Board) sent a letter to the Secretary of Energy that documents the Board's conceptual design review and describes "eight safety observations that should be addressed" in the preliminary design. One observation found that gloveboxes, glovebox ventilation, and glovebox inerting systems were not classified as safety significant for facility worker protection, which was non-conservative for the conceptual design.
- March 28–30, 2023: The Board's staff conducted a follow-up onsite review with project personnel on revision four of the hazard analysis and focused the review on facility worker hazards.
- March 29, 2023: The Board sent a letter with a reporting requirement to the Secretary of Energy that documented safety concerns with facility worker safety and requested a briefing during an onsite visit the week of May 8, 2023.
- May 11, 2023: Project personnel briefed the Board at the Savannah River Site on facility worker safety concerns in response to the letter dated March 29, 2023. During these discussions, the Board reiterated its safety concerns that the safety control set was inadequate.