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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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99-0002586



November 3, 1999

The Honorable David Michaels  
Assistant Secretary for Environment,  
Safety, and Health  
Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585-0119

Dear Dr. Michaels:

The staff of the Defense Nuclear Facilities Safety Board (Board) recently completed a chemical safety review at the Savannah River Site (SRS). The findings of this review are documented in the enclosed staff report. The Board is pleased that considerable progress has been made in this area in the past few years. The development of a site-wide chemical safety management plan and the designation of an effective chemical manager appear to have led to a working activity of remediation. Reviews of a small cross section of chemical activities in F-area, inactive facilities, and the Savannah River Technology Center laboratories revealed evidence of the effectiveness of the program.

The enclosed report does however note that the prioritization of inactive facilities at SRS does not clearly identify the highest priority safety issues. DOE should review this risk-ranking methodology to ensure that priority is assigned to the highest hazards. The Board encourages continued vigilance in chemical safety matters and ongoing improvement and refinement of the SRS chemical safety management system.

The Board's staff will continue to follow closely the progress of chemical safety within the framework of Integrated Safety Management throughout the complex.

Sincerely,

A handwritten signature in black ink, appearing to read "John T. Conway".

John T. Conway  
Chairman

c: Mr. Mark B. Whitaker, Jr.  
Mr. Greg Rudy

Enclosure

**DEFENSE NUCLEAR FACILITIES SAFETY BOARD****Staff Issue Report**

August 30, 1999

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director  
J. K. Fortenberry, Deputy Technical Director**COPIES:** Board Members**FROM:** W. Von Holle**SUBJECT:** Chemical Safety Review at Savannah River Site

This memorandum documents an issue reviewed by the staff of the Defense Nuclear Facilities Safety Board (Board) during a trip to the Savannah River Site (SRS) on August 17–18, 1999.

**Background.** This trip was part of a cross-cutting review of chemical safety throughout the Department of Energy (DOE) complex. Hanford and the Oak Ridge Y-12 Plant were visited previously, and video conferences were held with representatives of the Rocky Flats Environmental Technology Site and SRS.

Among the major sites with bulk chemicals and legacy facilities reviewed, SRS was found to have the best chemical safety program. The following are highlights from the SRS review.

SRS has a sound chemical safety program. The SRS safety management team is in place, with an effective chemical manager and a draft management plan. This situation represents a vast improvement since the first review conducted by the Board's staff, when no such manager or plan existed. The manager is in charge of the Chemical Commodity Management Center, which is the clearinghouse for all chemical safety issues at SRS. He has a good working relationship with all elements of contractor management and DOE oversight. SRS has complied with the Secretary of Energy's initiatives regarding characterization and understanding of tank vessels following the 1997 Hanford tank explosion. According to the SRS contractor and DOE, no open issues remain. It may be worthwhile for DOE to distribute the valuable lessons learned from these SRS efforts throughout the complex, perhaps by participation in the Center for Chemical Process Safety.

Chemical safety within the Nuclear Material Stabilization and Storage Division was reviewed. Management of operational and storage safety appeared effective. Safety issues noted in the staff's earlier reviews had been closed, including remaining chemical vulnerabilities from the 1994 DOE study and findings from the Facility Evaluation Board. A tour of the F-Area outside facilities revealed clean and orderly storage of several hazardous chemicals.

The staff reviewed safety analyses and prioritization activities for the inactive facilities (including those inside active facilities). A total of 161 inactive facilities have been identified and prioritized using checklists completed by facility personnel. Risks associated with these facilities have all been ranked by the contractor using the contractor's own method. Of these facilities, 29 have been analyzed in detail by means of walkthroughs conducted by a team of experts for a period of two weeks each.

It is possible that the algorithms used by SRS to screen and prioritize work on inactive facilities may not highlight facilities with safety issues. The staff toured the three highest risk-ranked inactive facilities. Building 777-10A has some sealed sources and several environmental noncompliances, but no apparent serious safety hazards. Building 321-M, the Fuel Fabrication Facility, has a small amount of enriched uranium holdup, as well as many slip-and-fall hazards associated with building deterioration. The worst safety hazard was observed in the Building 284-F Powerhouse, which exhibits two serious hazards from falling debris from the smoke stack and friable asbestos. The staff noted that some of the hazards resulting in the high risk rankings were associated with environmental noncompliance (Resource Conservation and Recovery Act). The staff believes that the ranking methodology used does not clearly identify actual safety hazards.

It is unclear how SRS has handled miscellaneous underground tanks. Based on experience at Hanford, such tanks may constitute significant risks. Ancillary tanks and miscellaneous equipment that may contain hazards are not listed separately on the ranked list, but presumably will be included in the final reports for the individual facilities. The staff has requested final reports on some of the highest-ranked facilities to determine exactly how the final risk ranking was achieved.

The staff reviewed the safety program at the Savannah River Technology Center (SRTC) and Analytical Laboratory. Policy and procedures for research and development (R&D) activities were described to the staff in detail. A checklist is used to determine what kind and level of hazard assessment is required (e.g., Job Hazards Analysis, Process Hazard Review, Unreviewed Safety Question Determination) and the proper controls. The contractor Facility Evaluation Board recently reviewed the SRTC safety system and determined it to be excellent. SRTC's conduct of research is aligned with the core functions of Integrated Safety Management (ISM) and builds on the ISM infrastructure at SRS. Consistent development and implementation of controls, enhanced prework controls, and strengthening of operational interfaces between researchers and facilities are emphasized.

The staff also visited the TNX facility, where non-nuclear R&D simulations for SRS activities are conducted in a laboratory setting. The staff's observations indicate that the work at the facility is being done safely, and TNX legacy facilities and vessels, which are physically empty, are being maintained safely as well.