

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 13, 1994

MEMORANDUM: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: J. T. Arcano, Jr., SRS HLW Program Manager

SUBJECT: Review of Conduct of Operations at the F-Tank Farm at the Savannah River Site, May 26, 1994

1. **Purpose:** This memorandum documents a DNFSB staff visit by J. T. Arcano, Jr. to FTank Farm at the Savannah River Site (SRS) on May 26, 1994 to review Department of Energy Savannah River (DOE-SK) and Westinghouse Savannah River Company (WSRC) conduct of operations.
2. **Summary:** Newly reorganized Tank Farms Area management appears to be focusing efforts on improving training, qualification, and conduct of operations. A Training Improvement Plan was issued in November 1993, and is being implemented. As well, several other new programs are being implemented, including conduct of operations, configuration management, work control, and temporary modification control. The success of these programs remains to be proven. Weaknesses identified during the review include:
 - Lack of a qualification program for engineering personnel
 - Lack of an adequate configuration baseline
 - Numerous occurrences of noncompliance with lockout/tagout procedures
 - Lack of adequate work control
 - Lack of adequate control of temporary modifications
 - Questionable quality of initial and 10-day occurrence reports
3. **Background:** The F-Tank Farm operates 22 high level radioactive waste (HLW) tanks containing 14.5 million gallons of liquid HLW with 171.3 million curies of radioactivity. In April 1993, the H-Tank Farm Concentrate Transfer System (CTS) was inadvertently flooded while flushing a system demister and reheater. This flooding caused the spread of radioactive contamination from the ventilation piping to the surrounding area. As a result of this event, H- and F- Area evaporators were secured in order to upgrade the conduct of operations; DOE-SR conducted a Type-B investigation.
4. **Discussion**
 - a. **Concentrate Transfer System Flooding Incident:** The CTS flooding incident investigation identified deficiencies in the areas of training, qualification, and conduct of operations. To compensate for these deficiencies, WSRC HLW

Division made management changes and implemented a "deliberate operation plan." Newly installed management appears to be focusing efforts on improving training, qualification and conduct of operations in the Tank Farms. The deliberate operation plan included training enhancements, and procedure and conduct of operations improvements. Other actions resulting from the April 1993 CTS contamination incident include:

- The F-Tank Farm shift structure was redefined with the addition of shift managers and shift technical engineers (STE). Shift managers were selected based on their education, experience and waste management knowledge, and were given overview training in systems and safety requirements. Shift technical engineers, all degreed, were given a 13-week training program. This program included fundamental concepts and systems training, followed by a period of "on-line seasoning."
- A WSRC Training Improvement Plan was issued in November 1993 to define actions needed to upgrade operations personnel training and qualification at the H- and F-Tank Farms. This plan describes the incumbent Upgrade Training Program, Initial Training Program, and the STE Training Program.
- F-Tank Farm has implemented a Plan-of-the-Day Meeting attended by the Facility Manager, his direct reporting managers and shift personnel; upcoming evolutions are prioritized and discussed.

- b. ***Implementation of Conduct of Operations Manual:*** Sitewide implementation of the Conduct of Operations Manual (WSRC 2S Manual) is underway. 16 of 27 newly developed procedures have been implemented. Planned implementation extends out several years for the *Biennial Qualification Program* (January 1997), *Continuing Training for Operators* (June 1997), and *Label Installation* (July 1996).

Two management assessment programs are being implemented to formally assess the status of conduct of operations: the Management Overview Program (2S Manual, Section 5.12), and the Facility Monitoring Program (2S Manual, Section 5.13). A review of the *Safety and Housekeeping* (management overview) and *Lockout/Tagout* (facility monitoring) management assessment criteria revealed that they were administrative in nature and not performance-based reviews. The DNFSB staff believes that management must carefully monitor operating performance in order to ensure proper execution of the conduct of operations program.

- c. ***Training and Qualification of Engineering Personnel:*** The WSRC Tank Farm Area Manager expressed concern that the HLW Management Division engineering group lacks experience and an adequate number of personnel. In March 1994, this engineering organization was reorganized to consolidate the

engineers from H- and F- Tank Farms into one group of cognizant system engineers responsible for both tank farms. It should be noted that engineering personnel do not receive the same level of training as the facility supervisors and operators. Also, no qualification program or formal facility systems training program exists for these engineering personnel.

- d. **Lack of an Adequate Configuration Baseline**: A satisfactory configuration baseline for the Tank Farms has not been established. The DNFSB staff believes that the lack of an adequate baseline, coupled with less than adequate labeling of system components, sets the stage for less than adequate lockout/tagouts, even when lockout/tagout procedures are complied with. Several independent efforts are underway to update the various types of system drawings, however, none of these efforts appears to be working to the end of verified system drawings which correctly identify all system components.
- e. **Review of Occurrence Reports**: A review of recent occurrence reports with WSRC Tank Farm management revealed instances of problems in the following areas:
 1. **Noncompliance with lockout/tagout procedures** - Numerous occurrences involved noncompliance with lockout/tagout procedures. For example, an incident occurred on May 19, 1994 in H-Tank Farm during which an inadvertent transfer of HLW occurred. A WSRC investigation into the inadvertent transfer revealed that personnel who planned the lockout did not comply with the lockout/tagout procedure requirement to review electrical diagrams to verify what equipment would be affected by the lockout.
 2. **Lack of adequate work control** - In March 1994, a 2F-Evaporator gravity drain line flush valve was returned to service without operationally testing the valve, resulting in inadvertent flow into the evaporator pot. Subsequent investigation by WSRC revealed that the valve had not been assembled per plan, nor had it been inspected, and no formal controls were imposed to prevent the valve from being returned to service prior to operational testing. The only provision taken was to attach a caution tag to the valve as a reminder that the valve required operational testing. DNFSB staff discussions with the maintenance and operations managers revealed that no formal post-maintenance testing program exists for mechanical systems.
 3. **Lack of adequate control of temporary modifications**: In April 1994, it was discovered that temporary steam to a heater had been removed without proper authorization. WSRC personnel indicated that despite this indication of inadequate temporary modification control, no additional inspections of other temporary modifications were conducted to assess their status. It should be noted that a temporary modification control procedure is being implemented.

4. **Questionable quality of initial and 10-day occurrence reports:** At the time of the DNFSB staff review, a backlog of 87 overdue occurrence reports existed. Apparently, the backlog started when a subcontractor, who had researched and written the reports, was reassigned. WSRC tank farm personnel indicated that they are not staffed to keep up with the numerous reports which are generated and, as a result, the quality of these reports suffers.
 - f. **Need for Satisfactory Management Assessment:** The WSRC Tank Farm Area Manager expressed concern over the difficulties involved in his organization's implementation of several new programs simultaneously (temporary modification control, configuration management, conduct of operations, work control). DNFSB staff believes that this case highlights the need for management to effectively assess the implementation of these programs and to formulate, execute, and follow-up on the appropriate corrective actions to ensure the proper implementation of these programs.
5. **Future Actions:** With emphasis on the In-Tank Precipitation Facility, currently scheduled to start-up in December 1994, DNFSB staff will continue to review the Tank Farms training and qualification program, conduct of operations improvements, configuration management, and effectiveness of management assessments.