

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 25, 1995

MEMORANDUM
FOR: G. W. Cunningham, Technical Director
COPIES: Board Members
FROM: R. W. Barton
SUBJECT: Review of Hanford Tank Farms Operations and Implementation of Recommendation 92-4.

1. **Purpose:** This memorandum documents observations made during two visits to the Hanford Site. Defense Nuclear Facilities Safety Board (Board) staff members Ralph Arcaro and Ron Barton and outside expert Douglas Volgenau visited the site from May 22 to May 24. The second visit was conducted by Ralph Arcaro and Charles Keilers from June 27 to June 29, 1995. This report comments on Tank Farms operations and implementation of training and qualification improvements required by the Department of Energy (DOE) Implementation Plan for Recommendation 92-4.
2. **Summary:**
 - a. Westinghouse Hanford Company (WHC) no longer has a position in their Tank Farms training and qualification program equivalent to a Tank Farm supervisor. Instead, WHC uses a field crew Person-in-Charge (PIC), who provides direct supervision of tank farm field operations. Several selected individuals have been assigned to this function at the Tank Farms. There are no formal technical and safety training and qualification requirements identified for a PIC. Therefore, the roles and responsibilities of a PIC are not clearly defined and, as implemented, the PIC program may be adversely affecting the safety of operations and maintenance at the tank farms.
 - b. Although WHC has established a training and qualification program for Nuclear Process Operators that is compliant with DOE Order 5480.20A, deficiencies exist in other WHC training programs. For example, training in tank farm specifics such as safety systems or the safety envelope is not provided to maintenance technicians nor is a technical training program compliant with DOE Order 5480.20A provided for Technical Support staff.
 - c. A clear program to upgrade the technical competence of DOE-Richland (DOE-RL) personnel responsible for the Tank Farms and the Tank Waste Remediation System (TWRS) remains undefined.
 - d. WHC is planning to perform a cross-site transfer of high-level waste using a transfer line that has not been used in over five years. DOE-RL does not have a credible plan to assess the readiness of the Tank Farms to successfully perform this operation.

3. **Background:** Past reviews of operations, training, and qualification at Hanford have found these programs to be seriously deficient. The Board has sought improvements in these areas through issuance of several Recommendations. Recommendation 93-3 calls for the systematic improvement of the technical competence of DOE personnel. A major part of DOE's Implementation Plan for Board Recommendation 92-4 requires DOE to specifically improve the technical competence of the contractor and government personnel responsible for TWRS. A Board staff assessment performed in February 1995 found the program to upgrade government personnel to be deficient and the contractor program to be an improvement from previous Board staff visits.
4. **Discussion:**
 - a. ***Person-in-Charge (PIC):*** WHC has established a function entitled Person-in-Charge and has assigned individuals to this function. In practice, a PIC is an individual who is intended to provide direction and oversight of maintenance and operations activities in the field. The roles and responsibilities of the PIC are not clearly defined in existing WHC documents. Interviews with managers, supervisors, and operators revealed confusion as to where the PIC fit into their functions and into their supervisory chain. Although a PIC training program was included in the TWRS Training Administration Manual, the program required no additional technical training or certification and has not been fully implemented.
 - b. ***WHC Training and Qualification:*** Although the Nuclear Process Operator training program is significantly improved over that reviewed during early Board staff reviews, additional effort to improve and formalize the Tank Farm training and qualification programs is required before the program can reach the level of maturity and quality required by DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*. This conclusion is based on the following observations:
 1. A comprehensive TWRS Training Administration Manual (WHC-IP-0883) has been promulgated, but currently is estimated by WHC management to be only about 40% implemented.
 2. A maintenance training program has been conceptualized, but not developed, and no interim measures are in place.
 3. The training program for the Technical Support staff does not include the technical training required by DOE Order 5480.20A.
 4. An effective drill training program does not yet exist. Many deficiencies were noted during the conduct of a table top drill involving a simulated waste tank over-pressurization.
 5. An effective, formal process to evaluate the effectiveness of the training and qualification program was not in evidence.

6. Twelve level-of-knowledge interviews indicated general knowledge weaknesses concerning Tank Farm hazards, preventive measures, and system details.
- c. **DOE-RL Training and Qualification**: DOE-RL briefed the status of their technical training and staffing programs as related to Board Recommendation 93-3 and Recommendation 92-4 commitments. Although progress is being made and some required actions have been completed, significant effort remains to be accomplished to develop a clear program to improve the technical competence of DOE-RL personnel responsible for TWRS. The draft DOE-RL Technical Qualification Program reviewed by the staff was found to have the following deficiencies:
1. There is no direction in the area of selection requirements that ensures exceptionally well qualified personnel are hired when available.
 2. There is no explicit direction regarding the education and experience requirements.
 3. There is no description of actions to take for unqualified personnel, with the exception of providing unspecified additional training.
- d. **Cross-site Transfer Readiness**: DOE-RL and WHC are preparing to transfer approximately 440,000 gallons of high-level waste supernate from Tank 102-SY in the West Area to East Area double shell tanks. This action is being taken to allow the continued interim stabilization of single shell tanks in the West Area by transfer to East Area through Tank 102-SY and the cross-site transfer line. Although this line was successfully pressure tested recently, it has not been used to transfer waste since 1989. To prepare for this significant event, DOE-RL has prepared a Readiness Assessment Plan to be used to evaluate whether the operation can be performed safely. A review of the plan by the Board's staff indicated it is little more than documentation of routine oversight performed by DOE-RL and does not meet the intent of DOE Order 5480.31, *Startup and Restart of Nuclear Facilities*. The following specific observations were made:
1. The plan does not provide a methodology by which the assessment is to be performed.
 2. The plan does not provide criteria or standards by which readiness is assessed.
 3. The plan does not contain a definitive end point where readiness is declared.

Subsequent to the Board's staff review, DOE-RL decided to obtain an additional confirmation of readiness by having a separate review performed by DOE-RL personnel independent of Tank Farm Operations.

5. Drills and Operations Observed

1. **Tank Farms Operations and Tour**: Member of the Board's review team observed Tank Farm operations. The following observations were made:
 - a. During preparations for a single shell tank core sample it was noted that Radiological Protection requirements were inconsistent. Operators in the vicinity of the sample truck were dressed in anti-contamination hoods. The Board's staff reviewer and escort were not required by the Radiological Work Permit to wear hoods while observing the evolution even though in the same vicinity.
 - b. During a grab sample from Tank U-103 in the West area, personnel appeared generally knowledgeable and proficient in performing their duties. The PIC, who was directing a crew of over 20 personnel, had also been assigned by the West Area Shift Manager to simultaneously serve as the escort for the Board's review team member. This may have contributed to the PIC's distraction from effectively executing his duties as described below.

Before the sample riser blank flange was removed to obtain the required samples, the PIC directed the grab sample crew to evacuate the area immediately downwind of the riser. A short time later, a Kaiser employee, who was not part of the grab sample crew, entered the area immediately downwind of the sample riser to record tank farm instrumentation data. This went unnoticed by the PIC until the Board's review team member pointed out the situation to the PIC who immediately escorted the employee away from the grab sample area.

2. **Table Top Drill**: This drill involved a simulated waste tank over-pressurization, that results in a release of radioactive and hazardous material into the environment. Although some training value was derived from this drill, a number of errors and omissions significantly reduced its effectiveness.
 - a. No mention of the drill objectives was made prior to drill commencement.
 - b. Drill observers were not specifically assigned. The drill controllers/actors were also required to be the observers.
 - c. The drill scenario did not define the conditions under which the drill should be terminated, contained few precautions, and omitted several expected operator actions.

- d. A general lack of knowledge of the provisions of the Emergency Management Procedures Manual (WHC-CM-4-43) was demonstrated by the trainees and some of the controllers/actors.