

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 12, 1996

MEMORANDUM
FOR: G. W. Cunningham, Technical Director
COPIES: Board Members
FROM: Ralph Arcaro
SUBJECT: Trip Report - Review of Hanford Implementation of Board Recommendation 92-4, June 25-26, 1996

1. **Purpose:** This report documents a review performed by the Defense Nuclear Facilities Safety Board (Board) staff member Ralph Arcaro at the Hanford Site. The review covered the Hanford Tank Waste Remediation System (TWRS) and implementation of Board Recommendation 92-4.
2. **Summary:**
 - a. The Department of Energy Richland Operations Office (DOE-RL) intends to submit by the end of July the last deliverables indicating implementation of systems engineering at the site level. Recent examples of site-level integration indicate that site systems engineering is being satisfactorily implemented.
 - b. DOE-RL is continuing to revise its implementation plan for Recommendation 92-4 in order to reflect changes in the TWRS program, namely cancellation of several projects and the adoption of privatization of several TWRS functions.
 - c. DOE-RL indicated that negotiations with state regulators have required DOE-RL to maintain an "alternative path" for remediation of the waste in addition to the privatization initiative. Notable in these negotiations are the requirements that DOE and its contractors maintain expertise in waste remediation and that no more than a one year delay in the overall schedule be suffered should privatization fail.
3. **Background:** The Board issued Recommendation 92-4 to ensure that DOE employs a systems approach in the design of the Multi-function Waste Tank Facility (MWTF) that considers all health and safety requirements for the life cycle of the project. DOE responded by committing to implement systems engineering for the entire TWRS program. Although design and construction of the MWTF has ceased, commitments for all other parts of TWRS remain. DOE-RL is currently revising the 92-4 Implementation Plan to align the plan with the current path forward for TWRS.
4. **Discussion/Observations:** DOE's commitments made in the Implementation Plan for Recommendation 92-4 can be separated into three areas: TWRS Systems Engineering, Site-Wide Systems Engineering, and Improvement of Technical Expertise.
 - a. ***TWRS Systems Engineering:*** DOE-RL has issued a policy statement to WHC requiring that WHC use develop and use a systems engineering management plan (SEMP) in its development of TWRS. This directive requires the essential attributes of systems engineering including a mission analysis, requirements identification and management, optimization and alternatives analysis, and verification of system design. Although the policy does not explicitly require independent design reviews, these reviews are committed to in the Implementation Plan. The WHC SEMP and systems engineering procedures

implement the above requirements.

The privatization initiative of TWRS has removed the responsibility for the majority of TWRS development away from WHC. As part of its systems engineering effort, WHC will continue to develop interface requirements between it and the privatized vendor. Recent negotiations with state regulators by DOE-RL to accommodate this change in approach have resulted in the requirement that DOE-RL maintain an alternative path for TWRS development resident in the prime contractor for the site. Additionally, should privatization fail, this alternative path must be able to resume TWRS development while enduring no more than one year's delay. The alternative path is to be ensured by maintaining core expertise in waste processing. DOE-RL intends to identify 65 people in WHC and the Pacific Northwest National Laboratory with this expertise needed to maintain this alternative path. These people will be primarily involved in technology development activities; however, it remains unclear exactly how DOE-RL will ensure no more than one year's delay should the alternative path be taken.

- b. ***Site Systems Engineering***: As deliverables for 92-4, DOE-RL has developed a site systems engineering implementation plan and a site systems engineering management plan. The core of these directives ensures that coordination occurs between the different site organizations and the strategic planning group, such that program and projects support the overall Hanford Site mission and each other. Primary in this effort is the Site-wide Systems Engineering Integration Group (SWSEIG) with representatives of each Assistant Manager. This group meets weekly to ensure that the above coordination occurs. The following are examples of implementation of site systems engineering:
 - 1. The initial evaluation of program requirements found that the date the Solid Waste Division was planning on shipping cesium and strontium capsules from the Waste Encapsulation Storage Facility (WESF) to TWRS was prior to when TWRS was preparing to receive the capsules. The WESF planning was amended to remove the inconsistency.
 - 2. Within Environmental Restoration, the prime contractor, Bechtel, communicated to DOE-RL the need for a ground water treatment facility. The SWSEIG identified the Effluent Treatment Facility, operated by WHC, as a candidate to fill this need.
- c. ***Improvement of Technical Expertise***: The analyses committed to by DOE-RL to determine their staffing and expertise needs are well behind schedule and remain an open commitment in the current implementation plan and in DOE's draft revision. DOE-RL has identified the position of Lead Systems Engineer for TWRS as a critical staffing need.

DOE-RL has coordinated the training facet of Recommendation 92-4 with the efforts expended in support of Recommendation 93-3. At DOE-RL, these efforts have suffered from inconsistent implementation. In some TWRS divisions, the division managers have taken an active role in ensuring appropriate training is provided to ensure personnel are qualified. However, in some divisions, the program suffers from the poorly written and applied qualification standards.

5. Future Staff Actions:

- a. The staff will review and comment on DOE's revision to the Recommendation 92-4 Implementation Plan.