# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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August 7, 2003

The Honorable Jessie Hill Roberson
Assistant Secretary for Environmental Management
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-0113

Dear Ms. Roberson:

The staff of the Defense Nuclear Facilities Safety Board (Board) conducted a review of the implementation of the Board's Recommendation 2000-2, *Configuration Management, Vital Safety Systems*, at the Hanford Site during June 3–4, 2003. The Board's staff noted significant improvements in the implementation of this recommendation since its last review, which was conducted in October 2002.

Specifically, the staff observed improvement in the qualification and training programs for federal subject matter experts on vital safety systems, which previously had lacked the rigor required for these individuals to provide effective oversight of the contractors. The systems engineer program for CH2M Hill Hanford Group is well under way. However, the systems engineer program at Fluor Hanford has not improved as much as expected. Additional effort is required to make Fluor Hanford's systems engineer program a meaningful endeavor. A report on the review conducted at Hanford by the Board's staff is enclosed for your information and use as appropriate.

Sincerely,

John T. Conway
Chairman

c: Mr. Roy Schepens
Mr. Keith A. Klein
Mr. Mark B. Whitaker, Jr.

Enclosure

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

# Staff Issue Report

July 8, 2003

**MEMORANDUM FOR:** J. K. Fortenberry, Technical Director

**COPIES:** Board Members

**FROM:** D. Burnfield

**SUBJECT:** Status of Recommendation 2000-2, *Configuration Management, Vital Safety Systems,* at the Hanford Site

This report presents observations resulting from a review of the progress made toward implementing the Defense Nuclear Facilities Safety Board's (Board) Recommendation 2000-2, *Configuration Management, Vital Safety Systems,* at the Hanford Site. This review addressed the Department of Energy's (DOE) subject matter expert/systems engineer program, the contractors' systems engineer programs, and the status of institutionalizing Phase II assessment criteria. The review was conducted June 3–4, 2003, by members of the Board's staff D. Burnfield, D. Ogg, J. DeLoach, M. Sautman, and D. Grover.

**Background.** The Implementation Plan for Recommendation 2000-2 includes commitments to improve the competence of DOE and contractor engineering personnel, as well as to perform summary (Phase I) and detailed (Phase II) assessments of the material condition and operability of vital safety systems and the programs that support them (e.g., maintenance and engineering). DOE's Richland Operations Office (DOE-RL), the Office of River Protection (ORP), and their respective contractors have been working to implement and improve programs designed to meet the requirements of the Recommendation 2000-2 Implementation Plan.

**Discussion.** The staff's observations from this review are summarized below.

*DOE's Subject Matter Expert Programs*—ORP has taken the lead in developing the Safety System Oversight (SSO) personnel qualification program for use by all DOE personnel (the SSOs are termed subject matter experts in the Recommendation 2000-2 Implementation Plan). The SSO qualification requirements and process are intended to mirror the rigor of the qualifications used in DOE's Facility Representative Program. However, progress on implementing the SSO program at ORP continues to lag behind that in the majority of the complex.

DOE-RL has also embarked on a rigorous qualification program for its federal SSOs. DOE-RL representatives described a number of recent assessments of vital safety systems, conducted in part by the SSOs, that have yielded noteworthy findings. The corrective actions generated as a result of these assessments are expected to result in significant improvements in

safety and system reliability. The Board's staff suggested that DOE-RL develop one of its assessments of the fire protection system for the Central Waste Complex into a lesson learned for the DOE complex.

*Contractor Systems Engineer Programs*—CH2M Hill Hanford Group is well under way in the qualification of its systems engineers. All of these systems engineers are spending time in the field; they also regularly track system health reports, which have focused attention on system reliability and operability. One area for improvement is the need for systems engineers to track the status of system component calibration. Calibration deficiencies have been noted by the Board in the past year for facilities operated by the CH2M Hill Hanford Group.

Field activity by Fluor Hanford systems engineers is just beginning to mature. Fluor Hanford has assigned 41 systems engineers (plus backups) for its 88 vital safety systems. System notebooks have been developed for each of these systems, and it was reported to the staff that this effort has increased system knowledge and ownership. Systems engineers are required to walk down their systems quarterly. A review of a small number of recently qualified systems engineers revealed that many had qualified within a very short period of time (i.e., less than a month), casting doubt on the rigor of Fluor Hanford's program. Representatives of Fluor Hanford's engineering management admitted that the knowledge level of its systems engineers had not been significantly improved by the qualification process, except for one factor: the system engineers now had a better understanding of the authorization bases for their respective systems. The Board's staff encouraged Fluor Hanford to revisit the rigor applied in the qualification program to ensure that all systems engineers have the desired breadth and depth of technical knowledge.

Managers also noted to the staff that during the completion of the system notebooks, systems engineers gained a better appreciation and understanding of the associated support systems whose failure could significantly affect the operability of the vital safety system. In general, the Fluor Hanford program is not fully mature, and additional effort will be required to meet the intent of the DOE Implementation Plan. Based on information gathered during the review, the Board's staff believes that Fluor Hanford would benefit from a meaningful continuing education program in technical subjects, including the pursuit of advanced technical degrees and professional certifications for engineers.