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## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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May 11, 1994

The Honorable Hazel R. O'Leary  
Secretary of Energy  
Washington, D.C. 20585

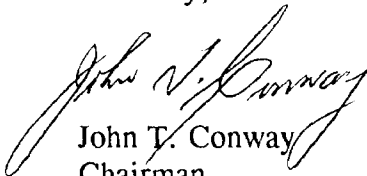
Dear Secretary O'Leary:

As part of following the Department of Energy's (DOE) implementation of the Defense Nuclear Facilities Safety Board (Board) Recommendation 91-6, the Board's staff is reviewing the radiation protection programs at various defense nuclear facilities.

The enclosed Board staff report provides results of the most recent review of the radiation protection program at the Hanford Site. The Board notes that considerable progress has been made over the past year in putting in place a program in compliance with DOE Orders 5480.11, 5480.6 and 5400.5. However, more remains to be done. The report identifies areas where program implementation is marginally satisfactory. For example, the Radiological Control Manual compliance assessment and implementation process has not always followed a rigorous and disciplined approach. As a result, some compensatory measures were instituted without sufficient technical justification and others have not been effectively instituted. In some cases, the qualification of Radiological Workers has been permitted based on an examination that is read to the individual, with subsequent pairing of workers with reading deficiencies with co-workers who can read to compensate for the literacy problem.

The enclosed report is forwarded for your information and use in furthering the full implementation by the M&O contractor of DOE's radiation protection requirements and practices.

Sincerely,



John T. Conway  
Chairman

c: The Honorable Thomas Grumbly, EM-1  
The Honorable Tara O'Toole, EH-1  
Mr. Mark Whitaker, Acting EH-6

Enclosure

**DEFENSE NUCLEAR FACILITIES SAFETY BOARD**

February 4, 1994

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director

**COPIES:** Board Members

**FROM:** J. W. Troan

**SUBJECT:** Report on the Radiation Protection Program at the Hanford Site

1. **Purpose:** This memorandum documents the Defense Nuclear Facilities Safety Board (DNFSB) technical staff and outside expert assessment of the Radiation Protection Program at the Hanford Site. This assessment is based on an on-site review at Hanford conducted on October 18-21, 1993, and subsequent document reviews and discussions.
2. **Summary:** The Radiation Protection Program at the Hanford Site was reviewed at the site level, and at a facility level for two specific facilities: the K-East Basin, and Building 329. Based on the on-site and subsequent document reviews, the program was considered by the staff to be marginally satisfactory and in need of improvement. Specific observations include: several of the compliance assessments in the Hanford Radiological Control Manual (RCM) Implementation Plan are incomplete or inaccurate, and some assessments did not give sufficient technical justification for compensatory actions; the DOE contingent supporting Radiation Protection, previously noted by DOE-HQ to be inadequate in size to satisfactorily oversee contractor activities on a day-to-day basis, has not been augmented; execution of the implementation of the RCM has deleted some beneficial requirements and standards that existed under the old system; technical guidance that defines criteria for what satisfies meeting the requirements appears to be lacking in some instances; the Kaisers Engineers Hanford (KEH) Radiation Worker Training Program has allowed the examinations to be read to individuals who lack reading proficiency, and subsequent compensatory actions for work assignments, such as pairing the person with a worker who has the capability to read, has not been formally proceduralized; ALARA Programs are instituted only at the contractor levels, and exist at various degrees of implementation; and the existing combinations of site standard survey procedures and equipment can not detect total contamination at levels required by the RCM.
3. **Background:** DOE Order 5480.11, *Radiation Protection for Occupational Workers*, DOE Notice 5480.6, *Radiological Control (Radiological Control Manual)*, and DOE Order 5400.5, *Radiation Protection of the Public and the Environment* establish the requirements for radiation protection for workers, the public and the environment, and provided the basis for the radiation protection review at the Hanford Site. These

standards were used in the assessments of the program, and employee work practices, training and knowledge level.

#### 4. Discussion/Observations:

- a. Hanford Site contractors are working towards implementing the requirements of the DOE Radiological Control Manual (RCM), and are projected to be 82.3% in compliance at the end of calendar year 1993, and with the exception of Articles 221, 421, and 422 will be fully compliant by April 1995 (refer to Figure 1)<sup>1</sup>. Several of the Hanford RCM implementation plan's compliance assessments were found to be incomplete or inaccurate, and some assessments did not give sufficient technical justification for compensatory actions. Overall, the Hanford Site plan to accomplish RCM training is consistent with the DOE Implementation Plan for DNFSB Recommendation 91-6.
- b. In contrast to other sites, the DOE contingent supporting Radiation Protection is very small, and may be overwhelmed by the magnitude of the work. The Department of Energy Richland Operations Office (DOE-RL) Quality, Safety and Health Programs Division (QSH) has two full time personnel and one contractor assigned to manage the Radiation Protection Program at the Hanford Site. Specifically, personnel in the Division's Occupational Safety Programs (OSP) Branch provide technical and contractual management of the Radiation Protection Program, with assistance from other Divisions. DOE Headquarters noted in November 1992, that the current number of personnel was inadequate to satisfactorily oversee contractor activities on a day-to-day basis, and requested that DOE-RL submit a proposal to upgrade the field division responsible for radiological controls. Implementation of a staffing upgrade was not apparent at the time of DNFSB Staff review.
- c. Implementation of the RCM appears to have disrupted the system that existed in support of DOE Order 5480.11. New documentation has sometimes displaced previous guidance and requirements. In some cases, beneficial detailed requirements have been removed from use. Contractor personnel appeared to recognize that this has occurred, and indicated that beneficial requirements that had been removed in the process of change-over are being restored. Completion of the restoration process was not confirmed by the DNFSB Staff at the time of the review. Westinghouse Hanford Company (WHC) and Battelle Pacific Northwest Laboratories (PNL) personnel indicated that they were in the process of reviewing and recovering the loss.

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<sup>1</sup> Hanford Radiological Control Manual Implementation Plan dated October 9, 1992 (DNFSB Log#: 93:3130), revised by Compliance Assessment Sheets, Revision 1 dated May 1993 (DNFSB Log#: 93:3783)

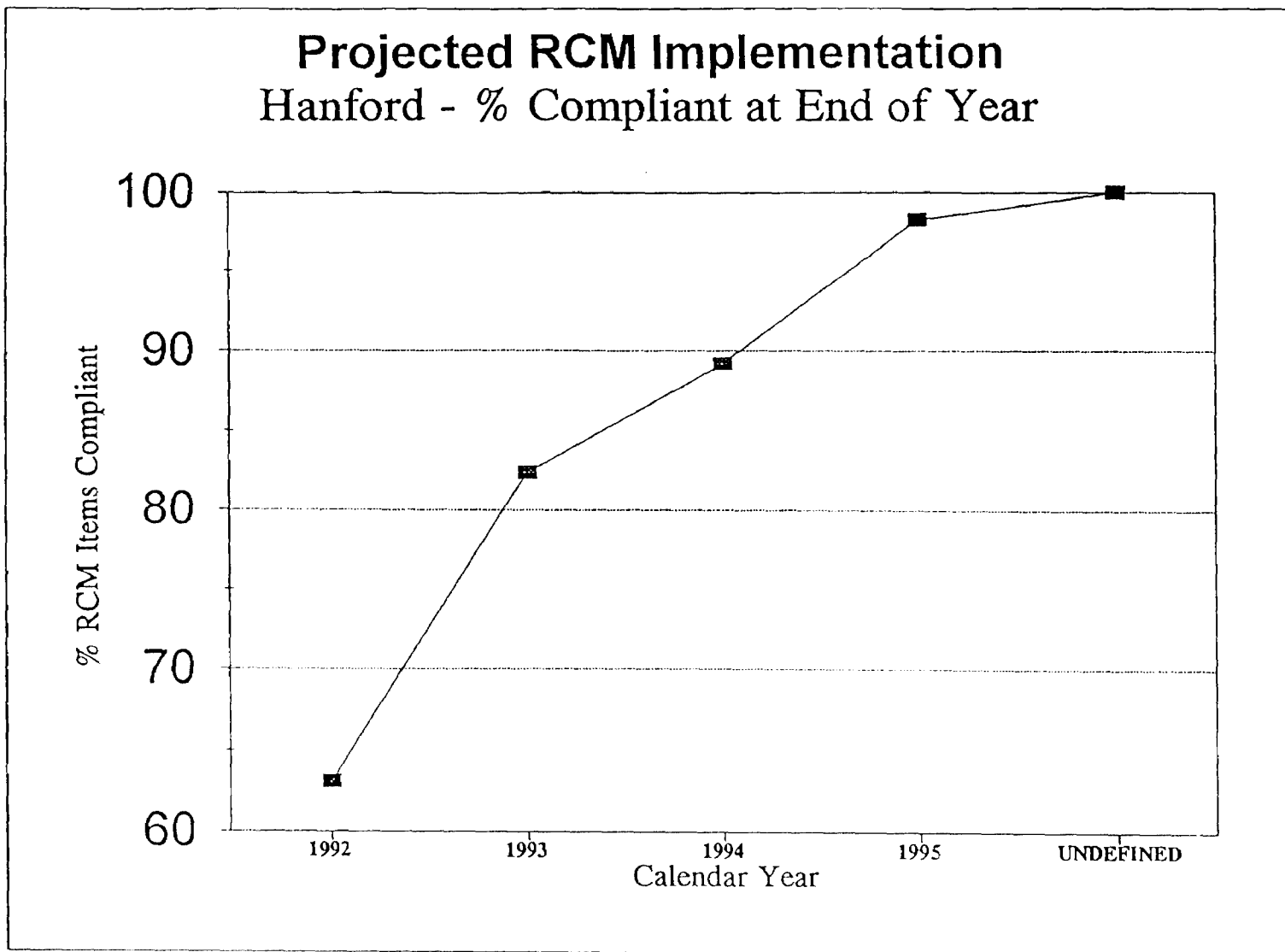


Figure 1

d. Technical guidance that defines criteria for what satisfies meeting the requirements that are stipulated by Radiation Protection Orders and Notices appears to be lacking in some instances. For example, assessments of air monitoring systems did not appear to follow technical protocols that would ensure that the technical requirements established by the RCM have been met.

e. The Kaiser Engineers Hanford (KEH) training program for Radiation Workers allows alternate methods of examination in the situation where an individual is unable to, or lacks the proficiency to read. Specifically, examination questions are read to the students with reading deficiencies. KEH personnel described that following qualification, Radiation Workers who have reading deficiencies are paired with a person who can read. Though this alternative examination practice is expected to be dispensed with once WHC includes KEH in their training program following the incorporation of KEH as a subcontractor, it is not evident that procedures are in place to compensate for the reading deficiencies in workers already qualified.

f. The principles and procedures of maintaining exposure to radiation and radioactivity as low as reasonably achievable (ALARA) were reviewed. The staff found that the Hanford Site did not have a site-wide program, but that individual contractors had ALARA programs that were in various degrees of implementation. In one case, a contractor's recent procedural change (resulting from adopting the new RCM) has deleted the ALARA procedural guidance that once existed.

g. The existing combination of site standard survey procedures and equipment can not detect total contamination at the levels required by the RCM's Table 2-2 *Summary of Contamination Values*. During discussion on Contamination Control, site personnel stated that material would not be released if radioactivity was detectable, and that the history of the material would be considered in the decision to release. The "detectable" amount of radioactivity is dependent upon the instruments used, and the use of detectability as a criterion for release may result in releasing material with radioactivity above the requirements of the RCM, DOE Order 5480.11, and DOE Order 5400.5. This issue was identified during the development of the Implementation Plan for DOE Order 5480.11 and has yet to be resolved. Current Implementation Plans do not identify compensatory actions, but identify that compliance will be achieved in June 1994.

Additional information from the review is available for amplification of the preceding observations.

**5. Future Staff Actions:** Staff actions are expected to include the following:

- a. Review RCM implementation at various WHC and PNL facilities.
- b. Review procedures and practices for assigning special beta dosimetry.
- c. Review Hanford's RCM §113 compliance equivalency determinations when they come available at the end of CY 93.
- d. Review air monitoring standards and requirements.
- e. Monitor the methods for training workers at Hanford as more hands-on work is required for Decontamination and Decommissioning (D&D) and remediation operations, in particular training for workers with language difficulties.
- f. Identify compensatory measures taken for partial compliance to RCM §221 *Personnel Contamination Control*, §421 *Release to Radiological Controlled Areas* and §422 *Release to Uncontrolled Areas*, and monitor progress made in achieving compliance.
- g. Review the practice of posting radiation dose rate signs in workstation areas where ALARA would be enhanced with the aid of the signs.