

12 JUNE 85

50-309

NOTE TO: G. D. WHITTIER  
MGR, NUCLEAR ENGINEERING  
& LICENSING  
MAINE YANKEE ATOMIC POWER CO.

FROM: P.M. SEARS  
PROJECT MGR, ORB#3, DL, NRR

SUBJ: DETAILED CONTROL ROOM DESIGN  
REVIEW

ENCLOSED FOR YOUR INFORMATION  
IS DRAFT MATERIAL TO BE DISCUSSED  
AT A MEETING IN BETHESDA TO  
BE SET SOME TIME IN JULY, 1985.

P.M. Sears.

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ENCLOSURE 1

HUMAN FACTORS ENGINEERING BRANCH  
DETAILED CONTROL ROOM DESIGN REVIEW  
DRAFT  
SAFETY EVALUATION REPORT  
FOR  
MAINE YANKEE ATOMIC POWER PLANT

POSITION

Licensees and applicants for operating licenses shall conduct a Detailed Control Room Design Review (DCRDR). The objective is to "improve the ability of nuclear power plant control room operators to prevent accidents or cope with accidents if they occur by improving the information provided to them" (NUREG-0660, Item I.D.). The need to conduct a DCRDR was confirmed in NUREG-0737 and Supplement 1 to NUREG-0737. DCRDR requirements in Supplement 1 to NUREG-0737 replaced those in earlier documents. Supplement 1 to NUREG-0737 requires each applicant or licensee to conduct a DCRDR on a schedule negotiated with the Nuclear Regulatory Commission (NRC).

NUREG-0700 (Ref. 7) describes four phases of the DCRDR to be performed by the applicant and licensee. The phases are:

1. Planning
2. Review
3. Assessment and Implementation, and
4. Reporting.

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Criteria for evaluating each phase are contained in Section 18.1, Revision 0 and Appendix A to Section 18.1, Revision 0 of the Standard Review Plan.

As a requirement of Supplement 1 to NUREG-0737, the applicants and licensees are required to submit a program plan that describes how the following elements of the DCRDR will be accomplished:

1. Establishment of a qualified multidisciplinary review team
2. Function and task analyses to identify control room operator tasks and information and control requirements during emergency operations
3. A comparison of display and control requirements with a control room inventory
4. A control room survey to identify deviations from accepted human factors principles
5. Assessment of human engineering discrepancies (HEDs) to determine which HEDs are significant and should be corrected
6. Selection of design improvements

7. Verification that selected design improvements will provide the necessary correction
8. Verification that improvements will not introduce new HEDs
9. Coordination of control room improvements with changes from other programs such as SPDS, operator training, Reg. Guide 1.97 instrumentation, and upgraded emergency operating procedures.

The NRC requires each applicant and licensee to submit a summary report at the end of the DCRDR. The report should describe the proposed control room changes, implementation schedules, and provide justification for leaving safety significant HEDs uncorrected or partially corrected.

The NRC will evaluate the organization, process, and results of each DCRDR. The evaluation of the applicant's and licensee's DCRDR efforts will consist of the following, as described in NUREG-0800 (Ref. 8).

1. An evaluation of the Program Plan report submitted by the licensee/applicant
2. A visit to some of the plant sites to audit the progress of the DCRDR programs
3. An evaluation of the licensee/applicant DCRDR summary report

SAIC assisted the staff in the evaluation and prepared the enclosed Technical Evaluation Report (TER). The NRC staff agrees with the technical positions and conclusions as presented in the TER.

The following is a summary of the staff's comments on MYAPCo's compliance with the DCRDR requirements of NUREG-0737, Supplement 1:

1. Establishment of a Qualified Multidisciplinary Team - it is not clear whether the necessary expertise was available at appropriate levels of effort for each of the DCRDR tasks.
2. System Function and Task Analysis (SFTA) To Identify Control Room Operator Tasks and Information and Control Requirements During Emergency Operations - It is not clear whether the staff's audit findings have been resolved; in addition, since MYAPCo plans to redo its EOP upgrade program, it appears that further task analysis and validation may be necessary.
3. Comparison Of Display and Control Requirements With a Control Room Inventory - The licensee has generated an acceptable control room inventory; however, since the acceptability of this requirement is contingent on both the inventory and the task analysis results, and since the task analysis is in question (see above), this remains an open item.



4. A possible pre-implementation audit
5. The preparation of a Safety Evaluation Report (SER) that will present the results of the NRC evaluation.

Significant HEDs should be corrected. Improvements which can be accomplished with an enhancement program should be done promptly.

#### DISCUSSION

The Maine Yankee Atomic Power Company (MYAPCo) submitted a Program Plan (Ref. 1) for conducting a DCRDR at the Maine Yankee Atomic Power Plant to the NRC on August 12, 1982. Staff comments on the Program Plan were issued on October 4, 1983 (Ref. 2). MYAPCo submitted a Summary Report on February 28, 1985 (Ref. 4).

The staff conducted an on-site in-progress audit of the MYAPCo DCRDR on February 13-17, 1984 with consultants from Science Applications International Corporation (SAIC). The licensee's DCRDR has been evaluated based on information provided in the Program Plan, Summary Report and during the in-progress audit.

The organization, methods and processes, and results of the Maine Yankee DCRDR were compared with the requirements of Supplement 1 to NUREG-0737 and guidance contained in NUREG-0700 and Section 18.1, Revision 0 and Appendix A to Section 18.1, Revision 0 of the Standard Review Plan. Consultants from

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### CONCLUSIONS

The licensee has provided sufficient evidence for the staff to affirm that one of the requirements of NUREG-0737, Supplement 1 has been satisfied, that is the requirement for a control room survey. However, insufficient information was provided to allow complete evaluation of the other eight requirements. Therefore, the staff recommends that the licensee submit supplemental information, as follows:

1. discussion about the level of involvement of specific team members in various phases and tasks of the DCRDR especially the human factors specialist, training specialist, and nuclear systems engineer;
2. further discussion to clarify how the NRC in-progress audit findings regarding the system function review and task analysis have been resolved;
3. discussion regarding the possible impact of revising the emergency procedure program on the DCRDR, especially the task analysis and validation;
4. discussion addressing the concerns raised in the enclosed TER regarding task analysis;



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4. Control Room Survey To Identify Deviations From Accepted Human Factors Principles - The control room survey has been conducted satisfactorily, using the guidance and criteria of NUREG-0700.
5. Assessment Of HEDs To Determine Which Are Significant And Should Be Corrected - While the licensee has developed an acceptable assessment process, actual implementation of the process is unclear, i.e., MYAPCo should describe how cut-off levels were determined.
6. Selection Of Design Improvements That Will Correct Discrepancies - The licensee did not provide a description of how this process was addressed.
7. Verification That Improvements Will Provide The Necessary Correction Without Introducing New HEDs - MYAPCo proposed an acceptable verification method during the in-progress audit. Staff could not determine whether that method was actually implemented.
8. Coordination Of Control Room Improvements With Changes Resulting From Other Improvement Programs - Specific coordination mechanisms and processes were not described in the licensee's Summary Report.