



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

STATUS REPORT - DETAILED CONTROL ROOM DESIGN REVIEW

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

POSITION

Item I.D.1, "Control Room Design Reviews," of Task I.D., "Control Room Design," of the Nuclear Regulatory Commission (Ref. 1; NUREG-0660), stated that operating licensees and applicants for operating licenses will be required to perform a Detailed Control Room Design Review (DCRDR) to identify and correct design discrepancies. The objective, as stated in NUREG-0660, is to improve the ability of nuclear power plant control room operators to prevent or cope with accidents if they occur by improving the information provided to them. Supplement 1 to NUREG-0737, dated December 17, 1982 (Ref. 2), confirmed and clarified the DCRDR requirement in NUREG-0660. As a result of Supplement 1 to NUREG-0737, each applicant or licensee is required to conduct their DCRDR on a schedule negotiated with NRC.

NUREG-0700 (Ref. 3), 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

NUREG-0800 (Ref. 4), "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants;" Section 18.1, provides the necessary evaluation criteria for evaluating each phase of the DCRDR.

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, and
9. Coordination of control room improvements with changes from other programs such as SPDS, operator training, Reg. Guide 1.97 instrumentation, and upgrade of 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 applicants' and licensees' DCRDR efforts will consist of the following, as described in NUREG-0800:

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
4. A possible Preimplementation Audit, and
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 Nebraska Public Power District (NPPD, the licensee) submitted a Program Plan (Ref. 7) for conducting a DCRDR at Cooper Nuclear Power Station to the NRC on March 1, 1984.

The staff conducted an on-site in-progress audit of the Cooper DCRDR Program on November 27-29, 1984 with consultants from Lawrence Livermore National Laboratory (LLNL).

NPPD submitted their "Cooper Nuclear Station Detailed Control Room Design Review Summary Report" (Ref. 9) to the NRC on February 4, 1984. The written results of the on-site in-progress audit (Ref. 10) were not available to NPPD prior to the submittal of their Summary Report, thus audit comments were not incorporated into the NPPD's submittal. By letter dated February 4, 1985 (Ref. 9) the NPPD stated an intent to submit a supplement to the DCRDR Summary Report in response to the in-progress audit comments, and by letter dated April 30, 1985 (Ref. 12) the NPPD anticipates the date of this submittal to be February 1986.

The organization, methods and processes, and results of the DCRDR were compared with the requirements of Supplement 1 to NUREG-0737 and guidance contained in NUREG-0700 and NUREG-0800, Section 18.1, Rev. 0 and Appendix A to Section 18.1, Rev. 0 of the Standard Review Plan (Refs. 3 and 4). Consultants from LLNL assisted in the evaluation and prepared the attached

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

CONCLUSIONS

The staff concludes that the NPPD could satisfy the requirements of Supplement 1 to NUREG-0737 for the Detailed Control Room Design Review of Cooper Station, by correcting specific shortcomings of the process. NPPD's DCRDR process, as described by the Summary Report, does not completely fulfill all of the DCRDR requirements of NUREG-0737, Supplement 1.

NPPD's actions with respect to these items should be discussed in a Supplemental Summary Report (SSR). The SSR should address, (a) the items identified in the Program Plan during the In-Progress audit conducted November 27-29, 1984 (Ref. 10) and, (b) those items resulting from our review of the DCRDR Summary Report. These items which are discussed in detail in the TER are summarized below. Responses to, and resolution of, these items are necessary in order for us to complete our review of the DCRDR.

1. Establishment of a qualified multidisciplinary review team.
The licensee has satisfied this NUREG-0737, Supplement 1 requirement.
2. System, function and task analyses (SFTA) to identify control room operator tasks and information and control requirements during emergency operations.
The effort conducted to date, when supplemented with the information as described in the enclosed TER, will satisfy the NUREG-0737, Supplement 1 requirements. The licensee should document the task analysis process used to identify needed information and controls and their characteristics as they relate to all operator tasks identified in the EOP operator verification and action steps. The licensee should maintain a consistent level of documentation throughout the task analysis process to permit the NRC to audit the process and results.

The licensee should complete that part of the Function and Task Analysis that did not encompass: (1) Other procedures implicitly referenced in EOPs that are required to support performance of EOPs, (2) existing Emergency Procedures, to the extent they will still be in use after implementation of the upgraded EOPs, (3) revised EOPs, if significant revisions are required prior to implementation, and (4) SPDS and PMIS procedures as they may be required to support operator performance during emergency operations.
3. A comparison of display and control requirements with a control room inventory.
The additional analysis identified in 2 above is needed to complete the comparison of inventory with results of the function and task analysis. Complete and submit documentation which shows that the information display and control requirements were compared with the inventory of existing instruments and controls.

4. A control room survey to identify deviations from accepted human factors principles.

The licensee should review existing surveys for adequacy and perform resurveys as necessary, and provide detailed documentation of the results and actions taken. The level of detail to which HEDs are documented should be improved to the point where each HED can be clearly understood from the written documentation alone.

The licensee should describe plans and schedules for providing human factors input to and coordination of the design and installation of the Plant Management Information System (PMIS) and SPDS within the control room, to ensure human factors principles, conventions, and plant nomenclature, that were applied to the control room, (including NUREG-0700 principles related to computers, control room environment and communications) are applied to the PMIS and SPDS.

Confirm that BWROG checklists and supplemental criteria that were different, and could not be compared with those defined in NUREG-0700, were equivalent.

Any portion of the Control Room Survey that is to be completed, repeated, or updated, should make use of NUREG-0700 guidelines or equivalent checklists.

5. Assessment of human engineering discrepancies (HEDs) to determine which HEDs are significant and should be corrected.

The process used by the licensee to assess HED significance did not follow its proposed survey guidelines. Therefore, the licensee's response does not satisfy this requirement. The licensee should reassess HEDs for safety significance using its proposed survey guidelines and should document the assessment process used to categorize HEDs and Human Engineering Observations (HEOs) in sufficient detail to permit NRC evaluation of the process.

6. Selection of design improvements.

In general, the process used for selecting HEDs to be corrected and for scheduling implementation dates meets the requirements of NUREG-0737, Supplement 1.

In its Supplemental Summary Report the licensee should describe all modifications planned to resolve HEDs, provide a schedule for correcting HEDs, and provide a summary justification for all HEDs with safety significance that will not be corrected or only partially corrected. In addition, it should provide documentation of the procedure used to evaluate each HED through the selection of design improvement, and the verification and implementation processes, in sufficient detail to permit NRC evaluation of the process used.

The licensee should complete feasibility studies used to evaluate HEDs relating to Engineered Safety Feature (ESF) Systems information and ESF controls located on back panels; and provide documentation that describes the methodology and procedures used for conducting the studies and provide the methodology and results in the Supplemental Summary Report.

7. Verification that selected design improvements will provide necessary correction, without introducing new HEDs.
The licensee should describe the process to be used to complete this activity, and provide the results in their Supplemental Summary Report. The process should be documented in sufficient detail to allow NRC to determine whether this requirement has been met.
8. Coordination of control room improvements with changes resulting from other programs such as SPDS, operator training, Reg. Guide 1.97 instrumentation.
Although the schedules for conducting other NUREG-0737 activities appear to be coordinated, it is not clear that a prescribed plan or process is being used to ensure the remaining activities are being coordinated.

The licensee should provide documentation describing its coordination and integration processes in the Supplemental Summary Report. Items that should be addressed in the Supplemental Summary Report are discussed in the attached TER.

We believe the licensee could meet the requirements of Supplement 1 to NUREG-0737 by submitting a satisfactory Supplemental Summary Report which addresses the concerns contained in this status report and the enclosed TER.

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Dated: September 5, 1985

REFERENCES

1. NUREG-0660, "NRC Action Plan Developed as a Results of the TMI-2 Accident," May 1980; Revision 1, August 1980.
2. NUREG-0737, Supplement 1, "Clarification of TMI Action Plan Requirements - Requirements for Emergency Response Capability (Generic Letter 82-33)," December 17, 1982.
3. NUREG-0700, "Guidelines for Control Room Design Review," September 1981.
4. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants;" Section 18.1, "Evaluation Criteria for Detailed Control Room Design Reviews (DCRDR)," September 1984.
5. "Response to NUREG-0737, Supplement 1, Emergency Response Capability, Cooper Nuclear Station," letter from J. M. Pilant (NPPD) to D. G. Eisenhower, (NRC) dated April 15, 1983.
6. "NRC Staff Review of the BWR Owners' Group (BWROG) Control Room Survey Program (Generic Letter 85-18)," letter from D. G. Eisenhower (NRC) to BWR Licensees, Applicants and Construction Permit Holders, dated April 19, 1983.
7. "Program Plan for Detailed Control Room Design Review, Nebraska Public Power District, Cooper Station," dated February 1984; submitted by letter from J. M. Pilant, (NPPD) to D. G. Eisenhower (NRC) dated March 1, 1984.
8. "Review of the Cooper Nuclear Station Detailed Control Room Design Review Program Plan Submittal," letter from D. B. Vassallo, (NRC) to J. M. Pilant, (NPPD), dated June 4, 1984.
9. "NUREG-0737, Supplement 1 - Detailed Control Room Design Review (DCRDR) Summary Report," (Received by NRC February 25, 1985), Letter from J. M. Pilant (NPPD) to D. B. Vassallo (NRC), dated February 4, 1985.
10. "Detailed Control Room Design Review In-Progress Audit Report," (Ref. Audit conducted November 27-29, 1984), letter from D. B. Vassallo, (NRC) to J. M. Pilant (NPPD), dated March 20, 1985.
11. "Technical Evaluation Report (TER) Detailed Control Room Design Review, Nebraska Public Power District, Cooper Nuclear Station," Lawrence Livermore National Laboratory, March 26, 1985.
12. "Detailed Control Room Design Review (DCRDR) In-Progress Audit Report Response," letter from J. M. Pilant (NPPD), to D. B. Vassallo (NRC), dated April 30, 1985.