

HUMAN FACTORS ENGINEERING BRANCH
DETAILED CONTROL ROOM DESIGN REVIEW
SUPPLEMENTAL SAFETY EVALUATION REPORT
FOR
SALEM GENERATING STATION, UNITS 1 AND 2

DISCUSSION

The Public Service Electric and Gas (PSE&G) Company of New Jersey submitted a Summary Report describing their Detailed Control Room Design Review (DCRDR) for the Salem Generating Station, by letter dated December 29, 1983 (Ref 1). The report was reviewed by the staff and consultants from Science Applications International Corporation (SAIC) and a Safety Evaluation Report (SER) (Ref. 2) was transmitted to the licensee by letter dated March 28, 1984. A meeting was held in Bethesda May 23, 1984, to discuss the six items identified in the SER and responses to these items were provided by the licensee in a letter dated September 18, 1984 (Ref. 3). Since this letter provided further information but did not close the items an on-site audit was conducted by the staff and consultants from SAIC the week of November 26, 1984. Results of the audit are provided in the attached Technical Evaluation Report (TER) prepared by SAIC. This TER is organized by the DCRDR phases recommended in NUREG-0700 and the elements described in Supplement 1 to NUREG-0737, but covers the six items documented in the Reference 2 SER.

CONCLUSIONS

The Public Service Electric and Gas Company has demonstrated a commitment toward meeting the requirements of Supplement 1 to NUREG-0737. The following is a summary of the staff's comments on PSE&G's compliance with the DCRDR review requirements:

1. Establishment of a qualified multidisciplinary review team. - The licensee has satisfied this NUREG-0737, Supplement 1 requirement.

8504290502 850417
PDR ADOCK 05000272
PDR

2. Function and task analysis to identify control room operator tasks and information and control requirements during emergency operations - The effort conducted two years ago for the DCRDR, when supplemented with the results of the more recent EOP task analysis effort, can be expected to satisfy the NUREG-0737, Supplement 1 requirement. A description of how the current EOP task analysis methodology and findings will supplement the earlier effort, and a description of what further human factors effort must be accomplished to ensure a comprehensive analysis of tasks for information and control requirements must be provided.

3. Comparison of display and control requirements with a control room inventory - The methodology being used by the EOP upgrade program to compare control and display requirements with actual controls and displays appears to be satisfactory as long as the licensee can demonstrate that a review has been incorporated to ensure that the human factors aspects of the control and display designs have been accounted for.

4. Control room survey to identify deviations from accepted human factors principles - The control room survey appears to have been conducted satisfactorily. Supplemental information is still required on the environmental survey methodologies and results. A description of the standards for abbreviations and color coding and the method of applying these standards is required. The staff is satisfied that the differences between the control rooms of Unit 1 and 2 have been addressed.

5. Assessment of HEDs to determine which are significant and should be corrected - The assessment process for cumulative and interactive effects of HEDs is not satisfactory. In addition, the staff is in disagreement with the licensee on the significance of certain HEDs which

have a potential for operator error. Further clarification regarding this concern is provided in the attached TER and the TER appendices contain lists of specific HEDs for which further response is required of the licensee.

6. Selection of design improvements that will correct discrepancies - The design selection process appears to have been accomplished satisfactorily. The staff's earlier concern regarding the lack of human factors considerations in the process has been dispelled. The attached TER and its appendices provide further details on specific HEDs in which the description of the resolution was either inadequate or incomplete, or the justifications for not correcting the HEDs were considered by the staff to be inadequate. Modified responses are required.
7. Verification that improvements will provide the necessary corrections without introducing new HEDs - The licensee's design change review process appears to establish a mechanism for verifying that improvements provide the necessary corrections without introducing new HEDs. However, the staff is still concerned that at this late stage in the design change review process, satisfactory human factors review may not be accomplished. The staff needs to know how an adequate human factors review will be accomplished.
8. Coordination of control room improvements with changes resulting from other improvement programs - The licensee has not demonstrated the establishment of an adequate mechanism or program for ensuring that the methodology and results of the improvement programs were adequately coordinated and integrated. PSE&G should provide documentation describing how this will be accomplished with the remaining emergency response capability programs.

In conclusion, Public Service Electric and Gas should meet all of the requirements of Supplement 1 to NUREG-0737 following its submittal and review by the NRC of a Satisfactory Supplemental Summary Report addressing the concerns contained in this SSER and the attached TER.

REFERENCES

1. Public Service Electric and Gas Company, Control Room Design Review Summary Report, Salem Generating Station, December 29, 1983.
2. Letter to R. Uderitz, PSE&G from S. Varga, NRC, SER on Detailed Control Room Design Review, Salem Generating Station, March 28, 1984.
3. Letter to S. Varga, NRC, from E. Liden, PSE&G, Supplemental Information, Detailed Control Room Design Review, Supplement 1 to NRUEG-0737, dated September, 18, 1984