



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

901003

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO DETAILED CONTROL ROOM DESIGN REVIEW

JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2

ALABAMA POWER COMPANY

DOCKET NOS. 50-348 AND 50-364

1.0 POSITION

Item I.D.1, "Control Room Design Reviews," of Task I.D., "Control Room Design," of the "NRC Action Plan Developed as a Result of the TMI-2 Accident," (NUREG-0660) states that operating reactor 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 accidents or to cope with them, should they occur, by improving the information provided to them. Supplement 1 to NUREG-0737, "Clarification of TMI Action Plan Requirements," confirmed and clarified the DCRDR requirements in NUREG-0660. In accordance with Supplement 1 to NUREG-0737, each applicant or licensee is required to conduct its DCRDR on a schedule negotiated with the Nuclear Regulatory Commission (NRC).

2.0 INTRODUCTION

Alabama Power Company (APCo or the licensee) has conducted a Detailed Control Room Design Review for the Joseph M. Farley Nuclear Plant, Units 1 and 2 (FNP). The NRC conducted in-progress audits at FNP in March 1985 and November 1986. APCo responded to the NRC's audit findings in a letter to the NRC dated May 14, 1987, and submitted their DCRDR Summary Report on December 29, 1986. The staff conducted another audit of the licensee's DCRDR, in conjunction with a review of their Safety Parameter Display System (SPDS), on February 5 and 6, 1990, and issued a summary of its findings on May 30, 1990. In a conference call on February 20, 1990, the licensee satisfactorily addressed the human engineering discrepancies (HEDs) that were identified by the staff as a result of the audit. APCo submitted a letter to the NRC on June 26, 1990, confirming a schedule for completing all remaining HED corrective actions by the end of the spring 1991 refueling outage for Unit 1 and by the end of the fall 1990 refueling outage for Unit 2. On August 3, 1990, a conference call was held between the NRC and APCo to discuss questions related to HEDs that were identified as a result of an Emergency Operating Procedures (EOP) inspection conducted by the NRC during the period of March 5-16, 1990. The licensee satisfactorily resolved the staff's concerns.

### 3.0 EVALUATION

The staff's evaluation of the FNP DCRDR follows. The evaluation is based on the previously identified documentation and audit findings and was performed using the criteria contained in Section 18.1 of the NRC Standard Review Plan (NUREG-0800, Rev. 0, 1984).

#### 3.1 Establishment of a Qualified Multidisciplinary Review Team

Descriptions of the management and staffing of the DCRDR were provided in the Summary Report and were reviewed using the guidance provided in Section 18.1 of the Standard Review Plan and determined to satisfy the requirement of Supplement 1 to NUREG-0737.

#### 3.2 Function and Task Analysis to Identify Control Room Operator Tasks and Information and Control Requirements During Emergencies

APCo conducted a task analysis based on Revision 1 of the Westinghouse Emergency Response Guidelines (ERGs). APCo personnel developed emergency operating procedures (EOPs) in accordance with their Procedures Generation Package (PGP) and the ERGs. System engineers from Westinghouse developed a comprehensive set of operator task requirements for each step in the EOPs, working with human factors consultants and APCo personnel.

The task analysis for FNP meets the requirement of NUREG-0737, Supplement 1 for system and function task analysis.

#### 3.3 Comparison of Display and Control Requirements With a Control Room Inventory

The purpose of comparing display and control requirements with a control room inventory is to determine the availability and suitability of the displays and controls required for performing operator tasks. The review team determined whether instrumentation and controls necessary to support the requirements of the EOPs were present in the control room, using the plant-specific simulator, a replica of the control room. Characteristics of the instrumentation and controls, as identified from the task analysis data, were compared to existing equipment and then validated through walk-throughs. APCo has satisfied this requirement of NUREG-0737, Supplement 1.

#### 3.4 Control Room Survey

To meet this criterion, APCo used Institute of Nuclear Power Operations-Nuclear Utility Task Action Committee (INPO-NUTAC) survey methods rather than the guidelines contained in NUREG-0700 ("Guidelines for Control Room Design Reviews", September 1981). Through an on-site audit conducted in 1986, the staff reviewed the results of the INPO-NUTAC survey methodology and identified several concerns. In a letter dated May 14, 1987, the licensee satisfactorily responded to the staff's concerns. The APCo survey satisfies the requirements of NUREG-0737, Supplement 1.

3.5 Assessment of HEDs to Determine Which Are Significant and Should Be Corrected

The staff reviewed the assessment methodology provided by the licensee in their Summary Report and determined that the NUREG-0737, Supplement 1, requirement for assessing HEDs to determine which are significant and should be corrected has been satisfied.

3.6 Selection of Design Improvements

The methodology for selecting design improvements was described by the licensee in a meeting with the staff on July 25, 1984. Further discussion was provided by the licensee in its Summary Report. HEDs were discussed with the licensee during the staff's on-site audit, February 5-6, 1990. A commitment was made by the licensee in a letter to the NRC dated June 26, 1990, to resolve all safety significant HEDs by the end of the next refueling outages for Unit 1 (spring 1991) and Unit 2 (fall 1990). The NUREG-0737, Supplement 1, requirement for selection of design improvements has been satisfied.

3.7 Verification That Selected Design Improvements Will Provide the Necessary Correction

Based on discussions with the licensee in the July 24, 1984, meeting with the staff, the licensee committed to verify HED corrections using a control room mock-up, detailed conceptual layouts, or walkdowns conducted in the simulator. A tracking system of HED corrections was also included in the licensee's verification process. During the staff's on-site audit in November 1986, a review of the licensee's description and results of the process of verifying that selected design improvements will provide the necessary correction indicated that the licensee has satisfied this NUREG-0737, Supplement 1, requirement.

3.8 Verification That the Improvements Will Not Introduce New HEDs

The Supplement 1 to NUREG-0737 requirement for ensuring that selected design improvements will not introduce new HEDs has been satisfied by the licensee based on discussions during the July 24, 1985, meeting and the results of the on-site audit conducted by the staff February 5-6, 1990.

3.9 Coordination of Control Room Improvements With Changes From Other Programs Such as the Safety Parameter Display System, Operator Training, Regulatory Guide 1.97 Instrumentation, and Upgraded Emergency Operating Procedures

The licensee has satisfied the NUREG-0737, Supplement 1, requirement for coordination of the DCRDR with other related programs.

#### 4.0 CONCLUSION

The NRC staff concludes that the DCRDR program implemented at FNP satisfies the nine DCRDR requirements of Supplement 1 to NUREG-0737. Any changes to commitments related to DCRDR made by the licensee may affect the basis for the staff's acceptance of the DCRDR program and must be submitted to the staff. The staff may confirm by an inspection that the corrective actions which the licensee has committed to perform as a result of the DCRDR have been completely and properly implemented.

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