

September 4, 1981

Docket No. 50-206
LS05-81-09-014

Mr. R. Dietch, Vice President
Nuclear Engineering and Operations
Southern California Edison Company
2244 Walnut Grove Avenue
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Rosemead, California 91770



Dear Mr. Dietch:

SUBJECT: SEP TOPIC VI-7.B, ESF SWITCHOVER FROM INJECTION TO RECIRCULATION
MODE (AUTOMATIC ECCS ALIGNMENT) - SAN ONOFRE 1

Enclosed is a draft evaluation of the electrical portion of SEP Topic VI-7.B for San Onofre Unit 1. This evaluation compares your facility with the criteria currently used by the regulatory staff for licensing new facilities. Please inform us if your as-built facility differs from the licensing basis assumed in our assessment with 30 days of receipt of this letter.

This evaluation supplements our July 24, 1981 evaluation and reflects our request for information on this topic dated March 4, 1981. As a result of our review, the staff proposes changes in the refueling water storage tank level measurement system. The need to actually implement these changes will be determined during the integrated plant safety assessment. This topic assessment may be revised in the future if your facility design is changed or if NRC criteria relating to this topic are modified before the integrated assessment is completed.

Sincerely,

Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

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Mr. R. Dietch

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TOPIC VI-7.B: ESF (ENGINEERED SAFETY FEATURES) SWITCHOVER FROM INJECTION TO RECIRCULATION MODE, AUTOMATIC ECCS REALIGNMENT

I. INTRODUCTION

Most Pressurized Water Reactors (PWRs) require operator action to realign the ECCS for the recirculation mode following a LOCA. The NRC staff has been requiring, on a case-by-case basis, some automatic features to assist in the realignment of the ECCS from the injection to the recirculation mode of operation. The safety objective of this requirement is to increase the reliability of long-term cooling by reducing the number of operator actions required to change system realignment to the recirculation mode.

The scope of this topic requires a review of the ECCS control system and the operator action required to realign the ECCS from injection to recirculation mode following a LOCA. The sequence of events from initiation of the injection mode to completion of the recirculation mode, the systems/components and instrumentation/controls utilized in the injection to recirculation process, and the automatic and/or manual process required to complete the switchover process are to be reviewed. The objective of this review is to determine if automatic switchover is necessary to protect public health and safety.

II. REVIEW CRITERIA

The current licensing criteria which govern the safety issue are identified in Table 7-1 of the Standard Review Plan. The most significant of these criteria are:

1. Branch Technical Position ICSB 20,
2. IEEE Std. 279-1971, and
3. Regulatory Guide 1.62.

III. RELATED SAFETY TOPICS AND INTERFACES

The scope of review for this topic was limited to avoid duplication of effort since some aspects of the review were performed under related topics. The related topics and the subject matter are identified below. Each of the related topic reports contain the acceptance criteria and review guidance for its subject matter.

- III-6 Seismic Design Considerations
- III-10.A Thermal-overload protection for motor operated valves
- III-11 Component Integrity
- III-12 Environmental Qualification
- IV-1.A Operation with less than all reactor coolant loops in service
- V-10.B RHR Reliability
- V-11 High Pressure/Low Pressure Interface
- VI-7.A.3 ECCS Actuation System
- VI-7.C.1 Independence of Onsite Power
- VI-10.A Testing of ESF System
- VI-10.B Shared Systems

- VIII-2 Onsite Emergency Power Systems
- VIII-3 Emergency dc Systems
- VIII-4 Containment Penetrations

The following topics are dependent on the present topic information for completion.

- VI-4 Containment Isolation System
- VI-7.C.2 ECCS Single Failure Criterion

IV. REVIEW GUIDELINES

ICSB 20 states that automatic transfer to the recirculation mode is preferable to manual transfer and should be provided for standard plant designs submitted for review on a generic basis under the Commission's standardization policy.

ICSB 20 also states that a design that provides manual initiation at the system level of the transfer to the recirculation mode, while not ideal, is sufficient and satisfies the intent of IEEE Std. 279 provided that adequate instrumentation and information display are available to the operator so that he can make the correct decision at the correct time. Furthermore, it should be shown that, in case of operator error, there are sufficient time and information available so that the operator can correct the error, and the consequences of such an error are acceptable.

V. EVALUATION

The present design of San Onofre Unit 1 provides two level instruments for containment sphere sump level and two instruments for refueling water storage tank level. Three of the four instruments are powered from the same bus. The fourth instrument is pneumatic and the air supply is not automatically connected to an outside source. Accordingly the loss of a particular division (Train A) makes it unlikely that the change over from injection to recirculation can be made properly.

However, as a result of the TMI Action Plan, Two Class 1E sump level channels are being installed. Each train, including power supplies, will be redundant to the other. A similar improvement for the refueling water storage tank is not being planned at this time.

An audit of minimum flow lines indicates that the failure of check valve 256 could result in a loss of some sump water after an accident via relief valve 226 but that sufficient time and adequate instrumentation exist to detect this failure before a release occurs.

VI. CONCLUSION

As a result of our review the staff has concluded that the present design of the instrumentation required by the operator to effect a change over from injection to recirculation does not satisfy the single failure criterion. We also conclude that the modifications proposed by the licensee present a significant improvement.

However, we find that the present procedures also rely upon refueling water storage tank level indication and the present system is not adequate. Accordingly, we propose that the licensee provide redundant Class 1E instrumentation for this parameter.

With regard to the isolation of minimum flow lines and design provisions to detect failures in the isolation, we find the present design to be acceptable.