



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 129 TO PROVISIONAL OPERATING LICENSE NO. DPR-13

SOUTHERN CALIFORNIA EDISON COMPANY

SAN DIEGO GAS AND ELECTRIC COMPANY

SAN ONOFRE NUCLEAR GENERATING STATION, UNIT NO. 1

DOCKET NO. 50-206

1.0 INTRODUCTION

By letter dated June 13, 1989, Southern California Edison Company (SCE or the licensee) requested a change to the Technical Specifications appended to Provisional Operating License No. DPR-13 for operation of San Onofre Nuclear Generating Station, Unit No. 1 in San Diego County, California.

2.0 DISCUSSION AND EVALUATION

On April 25, 1989, NRC issued Amendment No. 125 which, among other things, approved a modification to steam generator level instrumentation. Two narrow-range level instruments were changed to wide-range instruments because these instruments were environmentally qualified whereas the other wide-range instruments were not. Thus, the wide-range instruments played a dual role: initiation of auxiliary feedwater (AFW) and fully-qualified post-TMI steam generator level instrumentation.

During startup from the fuel cycle X refueling in May 1989, the plant experienced an inadvertent start of an auxiliary feedwater pump on low steam generator (SG) level. While manually controlling SG level at about 45% of narrow range, the new wide-range instruments were reading much lower and one channel initiated auxiliary feedwater at the equivalent level of about 5%. It was apparent that the new wide-range indicators were reading low and the apparent error increased with power level.

The source of the problem was traced to the existence of a "downcomer flow resistance plate" in the steam generator. The existence of this plate was not considered by SCE when it designed the new wide-range instruments. Since the wide-range variable leg tap is below this plate and the reference leg is above it, the dynamic pressure drop across the plate (and to a much lesser extent, downcomer flow resistance) causes a false low level signal. The magnitude of the effect is such that auxiliary feedwater would always initiate at power, which is unacceptable from an operational standpoint.

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By application dated June 13, 1989, the licensee proposes to revert back to the previously-approved arrangement wherein the two wide-range level instruments would be converted back to narrow-range level instruments to automatically initiate auxiliary feedwater. To provide wide-range level, the licensee proposes to add a new environmentally qualified wide-range level instrument on each steam generator to meet the post-accident monitoring criteria of Regulatory Guide (RG) 1.97, Revision 2. In addition, the turbine trip on high steam generator level would be removed from the other wide-range level and shifted to the new narrow-range level instruments such that both high level trip inputs would be provided by narrow-range level instruments.

By converting the two wide-range level instruments back to narrow range, the dynamic effects seen on the wide range (termed "decalibration" by the licensee) would not occur since both taps (for the reference leg and the variable leg) for the level instrument are located on the same side of the downcomer flow resistance plate. This arrangement was previously approved and is acceptable for operation.

The proposed addition of a wide-range level instrument on each steam generator will not impact operation of the instruments which automatically initiate auxiliary feedwater because it uses a different variable leg tap (below the downcomer flow resistance plate) from that used by the narrow-range instruments. However, its conformance with RG 1.97 has not been reviewed by the staff and will be carried as an open item to be closed in accordance with the licensee's Integrated Implementation Schedule approved by the NRC staff.

The use of the new narrow-range level for a second input to the turbine trip circuit on high SG level is an improvement over the previous design because the decalibration effect is non-conservative with respect to creating a turbine trip on high level. (The decalibration effect produces a false low level signal). The proposed arrangement would result in both SG level signals for turbine trip being provided by narrow range level signals which is acceptable.

3.0 NEED FOR EXPEDITED ACTION

As discussed above, the unit cannot operate with the level errors introduced by the current design, and an amendment approving the described changes is needed in order to permit startup. The licensee made a timely application for a license amendment as soon as it determined that a technical specification change was required to resolve the problem. Therefore, we have concluded that the criteria for expedited action under 10 CFR 50.91(a)(5) are satisfied.

4.0 FINAL DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

The proposed amendment would revert back to the original design basis with respect to auxiliary feedwater initiation, add a wide-range level indicator,

and improve the turbine trip circuitry. The wide-range level instrument and the changes to the turbine trip circuitry do not impact the safety function of the AFW initiation instruments.

Conformance of the proposed change of the AFW initiation instruments to the standards for a determination of no significant hazard as defined in 10 CFR 50.92 is shown in the following:

- A. Operation of the facility in accordance with this proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

Operation of the facility in accordance with this change has no effect on the accidents analyzed in the Updated Final Safety Analysis Report (UFSAR). The modifications associated with this proposed change involve converting two trains of qualified wide-range level instruments to narrow-range which will provide for the automatic AFW actuation.

The modifications associated with this proposed change also include changes to the steam generator high level alarm/turbine trip function. The high level alarm/turbine trip function is currently provided by one train of narrow-range and one train of wide-range level instruments. The proposed change would include using two trains of narrow-range level instruments for the high level alarm/turbine trip function. This will eliminate the decalibration problem associated with the use of the wide-range level instruments and will not affect the safety function of the narrow-range instruments.

The modifications associated with this proposed change will ensure that the systems involved will function according to their design and the actual AFW initiation level is not being changed. Thus, previous accident analyses are not impacted by this proposed change, and therefore, the probability or consequences of the analyses are not impacted.

- B. Operation of the facility in accordance with this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The AFW system functions in a mitigating capacity during design basis events. The most limiting design basis events do not credit automatic initiation of AFW. Rather, manual initiation is assumed at either 15 or 30 minutes depending on the type of transient. The modifications associated with this proposed change include utilizing steam generator narrow range transmitters versus wide range for automatic initiation of AFW. The steam generator water level at which AFW is initiated remains the same. Thus, this change does not impact the function of AFW during a design basis event, and operation of the

facility in accordance with these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated.

- C. Operation of the facility in accordance with this proposed change does not involve a significant reduction in a margin of safety.

The proposed change does not involve a reduction in the margin of safety associated with the AFW initiation function of the steam generator level instrumentation. The conversion of wide-range channels to narrow-range channels will eliminate the decalibration anomaly for the instrumentation initiating AFW. This will ensure a more accurate AFW initiation at the setpoint and within the allowable uncertainty specified in the Technical Specifications. Therefore, operation of the facility in accordance with this proposed change will not involve a significant reduction in a margin of safety.

Based on the above discussion, we have determined that the proposed changes involve no significant hazards consideration.

5.0 CONTACT WITH STATE OFFICIAL

The State of California has been consulted on this matter and had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

This amendment involves changes in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has concluded that this amendment involves no significant hazards consideration. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

7.0 CONCLUSION

We have concluded, based on the considerations discussed above, that:

- (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner,
- (2) such activities will be conducted in compliance with the Commission's regulations and
- (3) the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Dated: June 23, 1989