# SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

# SUPPORTING AMENDMENT NO. 49 TO LICENSE NO. DPR-13

# SOUTHERN CALIFORNIA EDISON COMPANY

## SAN ONOFRE UNIT NO. 1

#### DOCKET NO. 50-206

#### 1.0 INTRODUCTION

By application dated February 8, 1980 (Reference 1), Southern California Edison Company (the licensee) proposed to change the Appendix A Technical Specifications for the San Onofre Nuclear Generating Station, Unit 1, to permit Cycle 8 operation.

The reload for Cycle 8 will consist of the replacement of one Region 6 and 51 Region 7 fuel assemblies by 52 fresh Region 10 fuel assemblies. As in previous cycles, stainless steel fuel rod cladding will be used. Analyses supporting Cycle 8 operation are based on assumed nominal operation at 1347 MWt, 2100 psia system pressure, 553°F core inlet temperature, and 4.64 kw/ft average linear heat generation rate.

The hypothetical ejected rod accident at beginning of Cycle 8 was analyzed assuming more pessimistic values of the post ejection power peaking factors than had been previously assumed in past analyses. The results of past analyses are incorporated in the bases of the Technical Specifications and hence need revision. The licensee has proposed to modify the Technical Specification bases to delete reference to specific ejected rod accident calculations and add performance criteria used in the assessment of the hypothetical ejected rod accident.

#### 2.0 EVALUATION

An audit review was conducted based on the following considerations. The mechanical design of the Region 10 fuel assemblies is the same as the Region 9 fuel assemblies. The fuel mechanical, thermal, and hydraulic performance has been previously reviewed. Values of the peak to average linear heat generation rate, peak to average enthalpy rise, permissible axial offset control band, control rod insertion limits, and reactor protective system setpoints which appear in the plant Technical Specifications are not to be altered. Predicted available shutdown margin exceeds required shutdown margin.

A core reload perturbs kinetics parameters, control rod worth and power peaking factors.



Fuel vendor predicted values of kinetics parameters are predicted to be within the bounds of values used in the safety analyses. The values used in the safety analyses are extremum rather than expectation values. There is no basis to suspect that the reload fuel configuration will sufficiently perturb the kinetics parameters such that they are outside the bounds of extremum values used in the safety analyses.

-2-

The licensee asserts that predicted values of control rod worths (total, stuck rod, scram reactivity, bankworths, dropped rod, ejected rod) are within the bounds of values assumed in previous reference analyses. Similarly, the licensee asserts that power peaking factors with the exception of the beginning of Cycle 8 post rod ejection peaking factor are either within the bounds of values used in previous safety analyses or that deleterious changes (increases) of peaking factors relative to previous analyses can be accommodated within the overall conservatism of the previous analyses. We accept these assertions.

A substantive amount of work has been performed by the fuel vendor (Reference 2) and the NRC staff to assess plant safety using bounding cycle independent analyses. The minimum reanalysis required for Cycle 8 is illustrative of the success of this endeavor.

The beginning of cycle, hot full power and hot zero power, ejected rod accident was reanalyzed by the fuel vendor, Westinghouse, to reflect increases (relative to Cycle 7) in predicted values of post ejection peaking factor. Control rod worths assumed in the analyses were not altered. The changes are of the magnitude associated with a typical reload. Previously approved analytical methods were used (Reference 3). Predicted results of the analysis are, therefore, acceptable.

# TECHNICAL SPECIFICATIONS

The licensee has proposed to modify the basis section of Technical Specification 3.5.2 Control Insertion Limits to delete cycle specific ejected rod worths and predicted fuel centerline temperatures, substituting safety review criteria and by reference the calculational methodology (Reference 3).

The rod insertion limits as a function of power (Technical Specification 3.5.2) are selected such that, in part, should a control rod be ejected, the resultant reactivity insertion and peaking factor will be less than those values assumed in the safety analysis. The results of this analysis are a strong function of rod worth, peaking factor, delayed neutron fraction, and temperature coefficients. Inclusion of the ejected rod worth alone in the current Technical Specifications does not uniquely define the analysis. Inclusion by reference of the Westinghouse Topical Report (the proposed change) is a superior basis. Accordingly, we find the change acceptable

#### 3.0 ENVIRONMENTAL CONCLUSION

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR \$51.5(d)(4), that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

#### 4.0 CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: May 29, 1980

### References

- Southern California Edison Company letter dated February 8, 1980 transmitting Proposed Change No. 88 and Reload Safety Evaluation for San Onofre Nuclear Generating Station, Unit 1, Cycle 8.
- Westinghouse Report WCAP-9272 "Reload Safety Evaluation Methodology", dated March 22, 1978.
- 3. Westinghouse Report WCAP-7588, Revision 1-A, "An Evaluation of the Rod Ejection Accident in Westinghouse Pressurized Water Reactors Using Spatial Kinetics Methods", dated January, 1975.