



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 60 TO PROVISIONAL OPERATING LICENSE NO. DPR-13

SOUTHERN CALIFORNIA EDISON COMPANY

SAN ONOFRE NUCLEAR GENERATING STATION UNIT NO. 1

DOCKET NO. 50-206

1.0 INTRODUCTION

In response to NRC staff letter dated July 23, 1979, Southern California Edison Company (the licensee) submitted by application dated September 18, 1979, with supplemental information provided on February 24, 1982, a proposed license condition which would allow implementation of a secondary water chemistry monitoring program at San Onofre Nuclear Generating Station Unit 1. This application supersedes the licensee's application dated December 28, 1976.

2.0 BACKGROUND

In late 1975, we incorporated provisions into the Standard Technical Specifications that required limiting conditions for operation and surveillance requirements for secondary water chemistry parameters. The Technical Specifications for all pressurized water reactor plants that have been issued an operating license since 1974 contain either these provisions or a requirement to establish these provisions after baseline chemistry conditions have been determined. The intent of the provisions was to provide added assurance that the operators of licensed plants would properly monitor and control secondary water chemistry to limit corrosion of steam generator components; such as tubes and tube support plates.

In a number of instances, the Technical Specifications have significantly restricted the operational flexibility of some plants with little or no benefit with regard to limiting degradation of steam generator tubes and the tube support plates. Based on this experience and the knowledge gained in recent years, we have concluded that Technical Specification limits are not the most effective way of assuring that steam generator degradation will be minimized.

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Due to the complexity of the corrosion phenomena involved and the state-of-the-art as it exists today, we are of the opinion that, in lieu of specifying limiting conditions in the Technical Specification, a more effective approach would be to institute a license condition that required the implementation of a secondary water chemistry monitoring and control program containing appropriate procedures and administrative controls. Branch Technical Position MTEB 5-3, "Monitoring of Secondary Side Water Chemistry in PWR Steam Generators" provides the NRC staff's recommendations regarding criteria for a secondary chemistry monitoring and control program. The recommended criteria for water treatment and operational procedures include the identification of critical parameters (e.g. pH, cation conductivity, free sodium, dissolved oxygen, etc.) to be sampled and controlled, the incorporation of technical recommendations of the steam generator supplier, the specification of the location of sampling points, the procedure for recording and management of data, the procedures defining corrective action for various out-of-specification parameters, and the authority responsible for the interpretation of the data and the sequence and timing of administrative events required to initiate corrective action. These recommended criteria, if met, meet the requirements of General Design Criterion 14 insofar as secondary water chemistry control assures primary boundary material integrity.

The required program and procedures are to be developed by licensees with input from their reactor vendor or other consultants, to account for site and plant specific factors that affect water chemistry conditions in the steam generators. In our view, plant operation following such procedures would provide assurance that licensees would devote proper attention in controlling secondary water chemistry, while also providing the needed flexibility to allow them to deal effectively with an off-normal condition that might arise.

Consequently, we requested that the licensee propose a secondary water chemistry program which would be referenced in a condition to the operating license and would replace any proposed Technical Specifications on secondary water chemistry.

At our request the licensee provided additional information by letter dated February 24, 1982. It should be noted that the licensee utilizes phosphate treatment rather than volatile chemistry.

3.0 DISCUSSION AND EVALUATION

We have reviewed the licensee's submittals which include a copy of Station Order, SO1-E-2 entitled, "Water Chemistry Control,". SO1-E-2 summarizes sampling frequency, location of process sampling points, procedures for recording and management of data, description of corrective activity for off-normal point chemistry conditions, and the identification of responsibility. The cases covered include those listed below; there is also a section on records.

- a. Turbine Plant Chemistry.
- b. Limits and Testing Frequency (LT&F), Turbine Plant Chemistry, Steady State Operation.
- c. LT&F, Turbine Plant Chemistry, Abnormal Operation.
- d. Reactor Plant Chemistry.
- e. LT&F, Primary Plant Chemistry, Normal Operation.

The letter in addition to S01-E-2, included program elements describing standard chemical test methods for carbon dioxide, chloride ion, chlorine, pH, orthophosphate, sodium, and sodium/phosphate molar ratio. Free hydroxide is determined by the sodium/phosphate ratio which is measured on a regular basis. Westinghouse, by letter of March 27, 1981 has confirmed that their recommendations relative to S01-E-2 have been adopted by the utility.

Based on the material made available to us, we have determined that the licensee's secondary water chemistry monitoring and control program

- a) Adequately addresses all of the program criteria delineated in the NRC staff position on control and monitoring of secondary water;
- b) is capable of reducing the probability of abnormal leakage in the reactor coolant pressure boundary by inhibiting steam generator corrosion and tube degradation, and thus meets the requirements of General Design Criterion 14;
- c) is based on the NSSS vendor's recommended steam generator water chemistry program for a phosphate water chemistry;
- d) monitors the secondary coolant purity in accordance with Branch Technical Position MTEB 5-3, revision 2, and thus meets acceptance criterion 3 of Standard Review Plan Section 5.4.2.1, "Steam Generator Materials," revision 1;
- e) monitors the water quality of the secondary side water in the steam generators to detect potential condenser cooling water in-leakage to the condensate, and thus meets Position 3.f(1) Branch Technical Position MTEB 5-3, revision 2;
- f) describes the methods for control of secondary side water chemistry data and record management procedures and corrective actions for off-control point chemistry, and thus meets Positions 3.f(2)-(6) of Branch Technical Position MTEB 5-3, revision 2; and
- g) is capable of monitoring and recording the parameters deemed important for the control of secondary side water chemistry in plants utilizing phosphate treatment, and thus meets Position 3.e of Branch Technical Position MTEB 5-3, revision 2.

The condensate oxygen level is given as 7 ppb. In consideration of the sampling and analytical errors present in the measurement techniques at these small concentrations this limit is an adequate fulfillment of the requirement of MTEB 5-3.

We conclude that the proposed secondary water chemistry monitoring and control program for San Onofre Unit 1 meets (1) the requirements of General Design Criterion 14 insofar as secondary water chemistry control assures primary boundary material integrity, (2) Acceptance Criterion 3 of Standard Review Plan Section 5.4.2.1, revision 1, (3) Position 3 of Branch Technical Position MTEB 5-3, revision 2, and (4) the program criteria in the staff's position and, therefore, is acceptable. We will condition the operating license to require that the proposed secondary water chemistry monitoring and control program be carried out.

4.0 ENVIRONMENTAL CONSIDERATIONS

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.

5.0 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.

6.0 ACKNOWLEDGMENTS

The following NRC personnel have contributed to this evaluation:

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