



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO.146 TO FACILITY 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 of August 31, 1990, Southern California Edison Company (SCE or the licensee) submitted a request for a change to the San Onofre Nuclear Generating Station, Unit No. 1, Technical Specifications (TS) appended to Facility Operating License No. DPR-13. The requested changes would modify Appendix A, Technical Specifications (TS), of the Operating License for San Onofre Nuclear Generating Station (SONGS), Unit 1. The licensee submitted Supplement 1 to Amendment Application No. 188 by letter of November 1, 1990. The staff of the U.S. Nuclear Regulatory Commission (NRC) met with the licensee on July 9-10, 1991, and May 11, 1992, at their corporate offices in Irvine, California to discuss open issues in its review of the proposed changes to the TS for SONGS Unit 1. The licensee submitted Supplement 2 to Amendment Application No. 188 by letter of September 9, 1991, and Supplement 3 by letter of June 5, 1992. The letters of September 9, 1991, and June 5, 1992, do not change the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

The initial request to modify the TS for SONGS Unit 1 was proposed to accomplish three objectives:

- Revise the section for the Emergency Core Cooling Systems (ECCS) to incorporate specific requirements for the operation of the Recirculation System, as committed in the licensee's response to a Notice of Violation by letter of January 25, 1990
- Incorporate commitments for the Containment Spray System and reduce the need to apply TS 3.0.3 (plant shutdown requirements) by providing more appropriate action requirements for ECCS components
- Use the Westinghouse Standard Technical Specifications (STS) for the format and basis of the new specifications

With the planned permanent shutdown of Unit 1 at the end of the current fuel cycle, the scope of the proposed TS changes was reduced in the latest supplement to the proposed amendment request. However, the proposed changes continue to resolve the major problems that have been encountered with the existing TS requirements.

Specification 3.3.1 addresses the current requirements for the operability of major system components under the headings of Safety Injection and Containment Spray Systems and specifies the operating conditions under which these system components are required to be operable. In addition, at any one time the current TS allow 72 hours for maintenance on any one pump and its discharge valve. While the current TS requires that valves and interlocks associated with each of these system headings be operable, it does not include a provision that allows 72 hours for maintenance for other than one specific set of valves. The TS does not include provisions that allow components that are not listed to be removed from service for maintenance or testing. Consequently, any maintenance or surveillance activity that results in these components or multiple components of the same train being inoperable would cause the facility to be subject to the shutdown requirements of Specification 3.0.3. This has necessitated the use of temporary waivers to permit some surveillance activities to be performed without entering into a TS shutdown requirement.

The Containment Spray System is required to be operable under the current TS when the reactor coolant system (RCS) temperature is greater than 200°F while the Safety Injection Systems are only required to be operable when the reactor is critical. In contrast, operability requirements for ECCS subsystems in the STS are specified to include redundant trains in Modes 1 through 3, which includes operation with RCS temperature greater than 350°F, and to include one train of ECCS subsystems in Mode 4, which includes operation with RCS temperature between 200 and 350°F. Thus, the current TS are nonconservative with respect to the STS for specifying operability requirements for the ECCS subsystems when the reactor is subcritical.

The proposed changes to TS 3.3.1 address the weakness of the current TS with respect to the operability requirements for ECCS subsystems and the conditions under which they apply. TS 3.3.1.A has been modified to state that two trains of the Safety Injection, Hot Leg Recirculation, Cold Leg Recirculation, and Secondary Recirculation Systems shall be operable in Modes 1 and 2 and in Mode 3 when the RCS pressure is greater than or equal to 600 psig. This change clarifies that the operability of the two trains of the ECCS subsystems is required. This requirement is in contrast to the previously proposed listing of the major components associated with each train and stating that they are required to be operable. While the major system components are currently identified under the heading of Safety Injection Systems, the proposed change for TS 3.3.1.A clarifies that these components are also part of the Hot and the Cold Leg Recirculation Systems in addition to the Safety Injection System. This modification facilitates the addition of operability requirements for one train of the Hot and the Cold Leg Recirculation Systems under TS 3.3.1.B that apply in Mode 3 when RCS pressure is below 600 psig and in Mode 4.

The design for the normal Hot Leg Recirculation (HLR) System includes redundant features to minimize the effects of many potential single failures. However, single failure vulnerabilities exist in the normal HLR System. The alternate HLR System provides the redundant train, to perform this safety function, that is independent of the normal HLR System single failure vulnerabilities. As noted in the Bases Section, the requirement for the operability of redundant trains, that include the normal and alternate HLR Systems, provides protection for single active failures.

TS 3.3.1.B requires only one train for each of the Hot and Cold Leg Recirculation Systems to be operable during low RCS pressure operation. Under these conditions, one train of the Cold Leg Recirculation System must be operable. Also, at least one train of the redundant features provided for normal HLR recirculation must be operable for this system to be operable, or the alternate HLR System must be operable.

In the licensee's September 9, 1991, submittal a description of the flow paths for each safety system function was provided in response to the licensee's commitment to add requirements for the Recirculation System components. Under the currently proposed modifications, flow paths are grouped with the valves and interlocks associated with each train or common to both trains of the ECCS subsystems. That portion of the flow path used to provide secondary recirculation, which is not common to the Hot or Cold Leg Recirculation or Safety Injection Systems, is addressed under the proposed modifications by the identification of the Secondary Recirculation System as part of recirculation systems in TS 3.1.1.A. The secondary recirculation flow path provides a means for using ECCS subsystem components for decay heat removal as an alternative to the use of the Residual Heat Removal (RHR) System. The RHR System has components located in containment and that have not been environmentally qualified to remain operable following a major break of a steam line inside containment. Therefore, this change is consistent with the use of secondary recirculation flow paths as described in Section 6.3.3.4 of the updated final safety analysis report (UFSAR).

The Safety Injection System is required by TS 3.3.2 to be isolated from the RCS by the use of two barriers when the RCS pressure is less than 500 psig. These barriers prevent the potential for over-pressurization of the RCS during low temperature operation and the potential for boron dilution by the injection of condensate via the feedwater pumps that are used for safety injection. Hence, an RCS pressure of 600 psig was selected as the transition point for specifying the change in operability from one to two trains of the ECCS subsystems. The use of the 600 psig RCS pressure condition for this transition in the operability requirements of ECCS subsystem trains is consistent with the basis for 350°F RCS temperature that defines this transition in the STS based on the change in operation from Mode 3 to Mode 4. Furthermore, this condition is consistent with the need to isolate the Safety Injection System from the RCS for low temperature operation. Therefore, the staff finds that an RCS pressure of 600 psig is acceptable for defining the transition between one and two trains of ECCS subsystems being operable.

The operability requirements for the Containment Spray System are addressed by TS 3.3.1.C and are clarified in the proposed modifications by stating that two trains of this system and associated portions of the Recirculation System shall be operable in Modes 1 through 4. The refueling water pumps take suction from the refueling water storage tank (RWST) to provide containment spray during the initial phase of ECCS operation, however, the refueling water pumps take suction from the discharge of the recirculation pumps during the recirculation mode of ECCS operation. Therefore, the associated portions of the recirculation system are required to be operable to support the operability of the containment spray system during this mode of operation. This requirement is clarified by the proposed modifications of the TS.

The current provisions of TS 3.3.1 that provide a 72-hour allowable outage time for individual ECCS subsystem components are modified by the proposed TS change to address one train of the systems being inoperable. Action A addresses the condition that one train of the Safety Injection System, Hot Leg, Cold Leg, or Secondary Recirculation Systems, or necessary support systems is inoperable when the RCS pressure is greater than or equal to 600 psig. The required action is to restore the inoperable train for each system to operable status within 72 hours or be in at least Hot Standby within the next 6 hours and reduce RCS pressure to less than 600 psig in the following 6 hours. This action is consistent with the guidance of the STS that allows a relaxation of the capability to satisfy the single failure criterion for up to 72 hours for each redundant subsystem.

TS 3.3.1.B requires that at least one train of the Hot and Cold Leg Recirculation Systems and necessary support systems be operable when RCS pressure is less than 600 psig in Mode 3 and when in Mode 4. This is consistent with the guidance of the STS that does not require redundancy for ECCS subsystems during these conditions. Therefore, action B addresses the condition that both trains of HLR or CLR are inoperable. The required action is to restore at least one train to operable status within 1 hour or be in cold shutdown in the next 20 hours.

The TS need not state that the necessary support systems shall be operable because the definition of "operable" includes the requirement that all necessary support systems are capable of performing their associated support functions. Although, the two component cooling water pumps and the two salt water cooling pumps are listed in the current TS with the major system components for Safety Injection and Recirculation Systems, a specific listing of support system components is not necessary. Therefore, actions A and B were proposed in a manner to make it clear that the 72-hour outage time for an inoperable train of these systems applies when any necessary support system or support system component, in addition to the listed pumps, becomes inoperable.

Action C.1 addresses the Containment Spray System and provides a 72-hour allowable outage time limit when one train of it, the associated portions of the Recirculation System, or necessary support systems are inoperable. As noted for the proposed modifications for TS 3.1.1.C, portions of the Recirculation System provide flow from the containment sump to the suction of the refueling water pumps for containment spray during the recirculation mode of

ECCS operation. Necessary support systems are addressed by action C.1 which makes it clear that the 72-hour outage time for an inoperable train of containment spray also applies when any support system component is inoperable.

The licensee has determined that the current action to verify that both spray limiter valves are closed when a recirculation pump is inoperable, to protect the charging pumps from a loss of net positive suction head (NPSH), is in conflict with the operability requirements for the containment spray system. This action is not appropriate since the spray limiter valves must be open for the initial phase of containment spray operation. Action C.2 addresses appropriate actions to be taken when a containment spray limiter valve is inoperable. Under the proposed modifications, an inoperable spray limiter valve is required to be closed, to provide the required NPSH protection, only if one of the recirculation pumps is inoperable. However, the inoperable valve still must be restored to operable status in 72 hours. If an inoperable spray limiter valve could not be closed and a recirculation pump was inoperable, the shutdown requirements of TS 3.0.3 would apply since an action is not provided that addresses this situation. The proposed modification for action C.2 is consistent with the system requirements and is, therefore, acceptable.

The changes to TS 3.3.1.A, B, and C and to their associated action requirements are consistent with the guidance provided by the STS. The proposed modifications of the TS resolve the problems that have been identified and that exist under the current requirements. Therefore, the staff finds that these proposed TS changes are acceptable.

In addition to resolving problems that had been identified with the TS, the licensee has proposed to remove existing TS 3.3.1.C that specifies that redundant components be tested to demonstrate their availability before initiating maintenance on any component. The licensee also proposed to remove the requirement of existing TS 3.3.1.D to demonstrate daily the operability of the remaining recirculation pump when the other pump is inoperable. Such requirements were removed from the guidance in the STS many years ago because these actions may pose a greater risk to safety because it frequently removes from service the only component capable of performing the required safety function. Therefore, the staff finds that the removal of these requirements from the TS is acceptable.

Another proposed modification removes the requirement for demonstrating the operability of the auxiliary saltwater cooling and two screen wash pumps within 1 hour to verify their availability to backup a saltwater cooling pump during the 72-hour allowable outage time for one inoperable saltwater cooling pump. This change was proposed on the basis that one saltwater cooling pump has had no failures since 1984 and that the other has only been required to be removed from operation on three occasions during this period. In addition the safety related saltwater cooling pumps have been upgraded with the installation of motor-operated valves, the installation of check valves, and the seismic qualification of the piping. Therefore, on the basis of the demonstrated reliability of the saltwater cooling pumps and system improvements, the staff finds that the proposed modification to remove the testing and

availability requirements for the nonsafety related backup pumps is acceptable.

Finally, a number of editorial changes have been proposed. The following are examples:

Removed references to TS 3.3.3 for compliance with RWST water storage and boron concentration.

Clarified that there are "three" RWST level trip channels per ESF Switchover train.

Removed references to TS 3.3.4 for compliance with hydrazine tank limits.

The separate specification of valves and interlocks associated with each ECCS subsystem was removed and added to the list of components under TS 3.3.1.A for the Safety Injection and Recirculation Systems and under TS 3.3.1.B for the Containment Spray System. Flow paths were also included with the entry for valves and interlocks in each list. The scope of the valves, interlocks, and flow paths was clarified by noting that they may be common to both trains and not just associated with one train.

Because these editorial changes do not alter existing requirements, the staff finds that they are acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the California State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC 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 previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (55 FR 40476). Accordingly, the 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 the amendment.

5.0 CONCLUSION

The Commission has 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 the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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