

BEFORE THE UNITED STATES NUCLEAR REGULATORY COMMISSION

Application of SOUTHERN CALIFORNIA EDISON COMPANY and SAN DIEGO GAS & ELECTRIC COMPANY for a Class 104(b) License to Acquire, Possess, and Use a Utilization Facility as Part of Unit No. 1 of the San Onofre Nuclear Generating Station) DOCKET NO. 50-206
Amendment Application No. 188 Supplement 1

SOUTHERN CALIFORNIA EDISON COMPANY and SAN DIEGO GAS & ELECTRIC COMPANY, pursuant to 10 CFR 50.90, hereby submit Supplemental Amendment Application No. 188.

This supplemental amendment consists of Revision 1 to Proposed Change No. 151 to Provisional Operating License No. DPR-13. The revision to Proposed Change No. 151 modifies the Technical Specifications incorporated in Provisional Operating License No. DPR-13 as Appendix A.

Revision 1 to the proposed change is a request to revise the Action Statement for the Component Cooling Water Heat Exchangers contained in proposed Technical Specification, 3.3.7, "Component Cooling Water System," from 31 days to 7 days.

In the event of conflict, the information in Amendment Application No. 188 supersedes the information previously submitted.

Based on the significant hazards analysis provided in the Description of Proposed Change and Significant Hazards Consideration Analysis of Proposed Change No. 151, Revision 1, it is concluded that (1) the proposed change does not involve a significant hazards consideration as defined in 10 CFR 50.92, and (2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed change.

Subscribed on this 1st day of November, 1990.

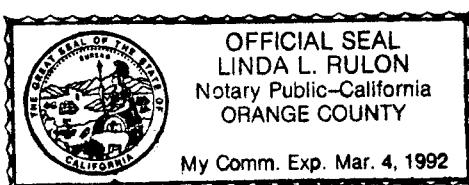
Respectfully submitted,

SOUTHERN CALIFORNIA EDISON COMPANY

By: H E Morgan
H. E. Morgan
Vice President and Site Manager

Subscribed and sworn to before me this
1st day of November 1990.

Linda L. Rulon
Notary Public in and for the
State of California



James A. Beoletto
Attorney for Southern
California Edison Company

By: James A. Beoletto

**DESCRIPTION AND SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS OF
REVISION 1 TO PROPOSED CHANGE NUMBER 151 TO THE TECHNICAL SPECIFICATIONS
PROVISIONAL OPERATING LICENSE NO. DPR-13**

Revision 1 to Proposed Change No. 151 is a request to revise our previous submittal of Technical Specification Section 3.3, "Safety Injection and Containment Spray Systems," of the Appendix A, Technical Specifications for San Onofre Nuclear Generating Station (SONGS), Unit 1.

EXISTING TECHNICAL SPECIFICATIONS

See Attachment 1.

PROPOSED TECHNICAL SPECIFICATIONS

See Attachment 2.

DESCRIPTION

The proposed change submitted in Amendment Application No. 188 will incorporate specific and complete requirements for the operation of the Emergency Core Cooling Systems (ECCS) into the Technical Specifications. This supplement provides a safety analysis and revises the action statement time limit for the component cooling water heat exchangers previously submitted. This supplement only changes proposed Specification 3.3.7, "Component Cooling Water System." The other proposed Technical Specifications submitted in Amendment Application No. 188 are unaffected by this revision.

DISCUSSION

Background

Amendment Application No. 188 submitted a new Technical Specification Section 3.3.7, "Component Cooling Water System." The proposed section addresses the operation of the Component Cooling Water (CCW) System and provides additional guidance not contained in the existing Technical Specifications. The proposed section applies the 72 hour action statement time limit of the Standard Technical Specifications (STS) for Westinghouse plants to the CCW system. We originally proposed extending the allowed time limit for the removal from service of one CCW heat exchanger to 31 days. At the time of the submittal we were in the process of performing a Probabilistic Risk Assessment (PRA) to support this proposed change. Since completion of the PRA we have re-evaluated our request and are proposing an action statement time limit of seven days.

The proposed specification provides a 72 hour action statement for the removal from service of one train of CCW. The proposed change includes a provision allowing one CCW heat exchanger to be removed from service for an extended time of seven days, with the associated heat exchanger CCW isolation valve de-energized in the open position. The extended period allows for the removal of marine debris from the heat exchangers and other maintenance which may not normally be expected to be completed within 72 hours. The new provision allows maintenance to be completed before it is necessary to shut down the unit, which would increase the heat load on the CCW system.

Both CCW heat exchangers are normally aligned for service on the common CCW header. During the period the proposed action statement would apply, the CCW system would be aligned such that the operable CCW heat exchanger could not be isolated by a single active failure. As required by the proposed specification, the CCW heat exchanger being removed from service would be isolated on both the tube and shell sides. The CCW motor operated valve on the heat exchanger in service would be de-energized in the open position to assure the valve could not be inadvertently closed. The open valve would be considered a passive component, assuring that a single active failure would not isolate the heat exchanger from the CCW system. The cross-tie valve between the saltwater headers to the CCW heat exchanger would also be opened to allow either saltwater cooling pump train to supply the CCW heat exchanger in service. In the event the CCW system is required for safeguards operation, both saltwater cooling pumps will start and supply cooling through the single heat exchanger. Our review of the design calculations for the CCW system supports operation with a single CCW heat exchanger in this alignment.

The STS 72 hour action statement permits an exemption from single failure consideration when normally applied. Operation with the CCW system aligned to one heat exchanger, in accordance with the restrictions of the proposed specification, does not significantly increase the susceptibility of the CCW system to single failure, since the single active component will be made passive in the position necessary for CCW flow. However, to be conservative, we have based our request for a seven day action statement on the results of a PRA which determined the change in risk of core damage for various action statement time periods.

Probabilistic Risk Assessment of Proposed CCW Heat Exchanger Outage Times

Introduction

A study was performed to determine the effect of the removal of one of two CCW heat exchangers from service on the overall risk of core damage. The study compared the STS 72 hour action statement limit with the proposed seven day and 31 day periods. The sequence examined LOCA events followed by a loss of CCW, caused by the failure of the heat exchangers, leading to core damage.

The CCW system supports a number of safety related plant loads. The PRA for the Loss of CCW event considered the following initiating events: a loss of auxiliary feedwater, a loss of emergency condensate (as an alternate to auxiliary feedwater), and a loss of cooling to the RCP seals requiring increased charging and safety injection. A value of 63 gpm was used for the value of RCP seal leakage, due to loss of cooling, as considered for the PRA. RCP seal leakage would increase after a loss of CCW, however it is limited to the range that would be expected prior to core uncover during a station blackout event. RCP seal leakage was also included in the < 3/8" diameter RCS leakage event tree. The analysis of core damage included all events that would be significantly impacted by the loss of both CCW heat exchangers. These are: Large LOCA, Small LOCA, < 3/8" Leakage, and Loss of CCW.

Event trees were developed and analyzed to determine the core damage associated with each of these initiating events. Core damage was estimated for these event trees based upon the proposed action statement time limits.

Assumptions

The following assumptions were made for the analysis:

Loss of CCW will result in a manual reactor trip as required by procedures for a loss of cooling to the reactor coolant pump thermal barriers.

The CCW heat exchangers were assumed to fail at a rate of once per 3 years ($9.5E-04/\text{day}$). The cause of failure was assumed to be primarily due to marine debris.

The probability of failing to restore the out of service heat exchanger when the in-service heat exchanger begins to show signs of marine fouling was estimated to be 0.05 per demand. This estimate was based on a history of CCW heat exchanger fouling at a very slow and gradual rate over a matter of weeks, the practice of verifying heat exchanger operability prior to removing one from service, and a determination that a heat exchanger could be restored to operation if required. However, if the recirculation system is in operation, restoration of a heat exchanger may not be feasible because of high radiation levels. Therefore, following a small or large LOCA, the probability of restoring an out of service CCW heat exchanger was assumed to be 0.

Loss of CCW due to loss of both CCW heat exchangers was assumed to fail charging/seal injection, recirculation and RCP seal cooling.

It was assumed the CCW pumps continue to operate without the heat exchangers when CCW is lost until a system high temperature is reached. Operation of the DC thermal barrier pump, which would circulate CCW to the RCP seals in a station blackout, was not assumed to provide any additional cooling due to the high temperature of the CCW.

The LOCA event trees and analysis were based upon the SONGS 1 Probabilistic Safety Assessment, Revision 4.

The failure rate for the CCW motor operated valves, or manual valves failing to remain open (failing closed) was assumed to be $5.0E-08/\text{hr}$ (Reference 3).

It was assumed that the maintenance on a heat exchanger results in an inoperable heat exchanger for the entire duration of the allowed outage time.

Results

A fault tree was created to determine the initiating event frequency for loss of CCW due to loss of both heat exchangers. The loss of CCW initiating event was calculated for out of service periods of 3 days, 7 days, and 31 days as:

	<u>Initiating Event Frequency</u>
3 days	1.0E-04/yr
7 days	2.4E-04/yr
31 days	1.0E-03/yr

These values were used to determine the loss of CCW core damage results.

As can be seen in Table 1 (attached), the core damage increase from an Allowed Out of Service Time (AOT) of 3 days to 7 days is 1.4E-06/yr and from 3 days to 31 days is 8.7E-06/yr. A core damage contribution of 1.4E-06/yr constitutes approximately 0.7% of the total Unit 1 core damage frequency (estimated to be 2E-4/yr), and a contribution of 8.7E-06/yr constitutes approximately 4.4% of the total Unit 1 core damage frequency. Therefore, a seven day action statement was accepted as not causing a significant increase in core damage risk.

SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS

As required by 10 CFR 50.91 (a)(1), this analysis is provided to demonstrate that Revision 1 to Proposed Change Number 151 for San Onofre Nuclear Generating Station, Unit 1 (SONGS 1) does not represent a significant hazards consideration. In accordance with the three factor test of 10 CFR 50.92(c), as demonstrated below, implementation of the proposed amendment was analyzed and found not to: 1) involve a significant increase in the probability or consequences for an accident previously evaluated; 2) create the possibility of a new or different kind of accident from any accident previously evaluated; or 3) involve a significant reduction in a margin of safety.

1. Will operation of the facility in accordance with this proposed change involve a significant increase in the probability or consequences of any accident previously evaluated?

Response: No

This revision to PCN-151 incorporates a seven day action statement time limit for removal from service of a Component Cooling Water (CCW) heat exchanger. The existing Technical Specifications do not provide a specific action statement applicable to the CCW heat exchangers. The Standard Technical Specifications for Westinghouse plants generally provide a 72 hour action statement time limit, during which time single failure assumptions are relaxed. Amendment Application No. 188, Proposed Change No. 151, provided STS action statements to reduce the need to apply the provisions of Technical Specification 3.0.3.

Both heat exchangers are on a common CCW header, and only one is required to support the CCW cooling load. The alignment for operation with a single CCW heat exchanger is described in the proposed Technical Specification. The alignment assures the CCW outlet valve is de-energized in the open position and therefore, is not subject to inadvertent closure. The STS 72 hour action statement permits an exemption from single failure. The extension of the 72 hour action statement to seven days is not considered to significantly increase the probability or consequences of an accident, since the single active component, the CCW heat exchanger outlet valve, will be de-energized in the open position.

A Probabilistic Risk Assessment (PRA) was performed to evaluate the significance of increasing the action statement time limit by determining the increase in the risk of core damage. The PRA evaluated those accidents which are relevant to a loss of CCW due to a failure of a single operating heat exchanger while the other heat exchanger is removed from service. The initiating events consider a loss of CCW, small break LOCAs, large LOCAs and < 3/8" diameter RCS leakage. The results of the PRA study indicated the increase in the risk of core damage was about 0.7%. This would represent a small portion of the total risk of core damage, and therefore it has been concluded that the incorporation of a seven day action statement for the CCW heat exchanger does not cause a significant increase in the probability of an accident, or the consequences of an accident.

2. Will operation of the facility in accordance with this proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The incorporation of a seven day action statement time limit for the CCW heat exchangers will not introduce new factors into the operation of SONGS 1 which could cause a new type of accident. The CCW system will be aligned to a single heat exchanger during the time the action statement time limit is in effect. The alignment required by the proposed specification assures that the heat exchanger removed from service is properly isolated in accordance with established operating procedures, and therefore does not introduce a new or different alignment of equipment which has not been previously evaluated.

The PRA was performed to evaluate the significance of the extension of the action statement time limit, and considered the affect on risk of core damage due to a loss of the CCW system during the time period one heat exchanger would be isolated. The significant events which depend upon the operation of the CCW system were considered in this analysis. The most significant effect of the change would be the small increase in risk (about 0.7%) due to a loss of CCW. This result was based on the evaluation of events which depend on the operation of the CCW system. Therefore, the incorporation of a seven day action statement time limit has been evaluated for the relevant accident scenarios and does not create the possibility of a new accident.

3. Will operation of the facility in accordance with this proposed change involve a significant reduction in a margin of safety?

Response: No

The PRA evaluated the significance in the increase in the risk of core damage due to the incorporation of a seven day action statement time limit for the CCW heat exchangers. It was determined that the total contribution to the total risk of core damage was approximately 0.7%. This is not considered significant, as it represents an increase of about 1.4E-6/year over the risk for the STS 72 hour action statement time limit. Additionally, the CCW heat exchanger in service will be aligned with the CCW outlet valve de-energized open to prevent an inadvertent loss of CCW. Therefore we have concluded that the margin of safety is not significantly reduced by the proposed change.

Safety and Significant Hazards Determination

Based on the above Significant Hazards Analysis, it is concluded that: (1) the proposed change does not constitute a significant hazards consideration as defined by 10 CFR 50.92; and (2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed change.

References

1. "Reply to a Notice of Violation," Mr. Harold B. Ray (SCE) to NRC, dated January 25, 1990.
2. Amendment Application No. 188, dated August 31, 1988.
3. Informal Report; Generic Component Failure Data Base for Light Water and Liquid Sodium Reactor PRAs, EG&G Idaho, EGG-SSRE-8875, February 1990.

Table 1
 Core Damage Results
 CCW Heat Exchanger AOT Calculation

Allowed Outage Time	Large LOCA CD (/yr)	Small LOCA CD (/yr)	<3/8" Leak CD (/yr)	Loss of CCW CD (/yr)	Total (/yr)	Core Damage Increase (/yr)
3 days	2.81E-05	7.64E-05	1.03E-05	7.67E-09	1.15E-04	-----
7 days	2.85E-05	7.74E-05	1.03E-05	1.84E-08	1.16E-04	1.4E-06
31 days	3.02E-05	8.29E-05	1.03E-05	7.67E-08	1.23E-04	8.7E-06