

DESCRIPTION OF PROPOSED CHANGE AND SAFETY ANALYSIS  
PROPOSED CHANGE NO. 204 TO THE TECHNICAL SPECIFICATIONS  
PROVISIONAL OPERATING LICENSE DPR-13

REVISION 2

This is a request to revise Appendix A Technical Specifications 2.1, "Reactor Core," 3.3.3, "Refueling Water Storage Tank," 3.5.1, "Reactor Trip System Instrumentation," 3.5.2, "Control Group Insertion Limits," 3.10, "Incore Instrumentation," 3.11, "Continuous Power Distribution Monitoring," and 4.1.1, "Operational Safety Items."

Reason for Proposed Change

The Cycle 10 Reload Safety Evaluation for plant operation with 20% steam generator tube plugging requires changes to the SONGS 1 Technical Specifications to reflect current accident analyses. These changes are related to the reanalysis of the Large Break Loss of Coolant Accident, Reactor Coolant Pump Locked Rotor/Shaft Break Event and Main Steam Line Break Event. Changes for these events also reflect new analyses assumptions to account for voltage dip conditions, and previously invalid reactor trip assumptions. Changes are also included to assure that Technical Specification 3.10, "Incore Instrumentation," and 3.11, "Continuous Power Distribution Monitoring," are applicable at all power levels in Mode 1 instead of just above 90% power. This will assure conformance with current standard technical specification requirements and will also assure that the plant is not allowed to operate in a condition which may be unanalyzed. Specific changes are discussed in the following paragraphs.

The Large Break Loss of Coolant Accident (LBLOCA) was reanalyzed since the existing analysis only covered two cases:

LBLOCA on the nominal Tavg program with 20% tube plugging

LBLOCA on the reduced Tavg program with 15% tube plugging

Since the steam generator tube plugging levels have exceeded 15%, reanalysis was necessary to allow SCE to continue operation on the reduced Tavg program. The reanalysis of the LBLOCA for operation on the reduced Tavg program with up to 20% steam generator tube plugging requires a change to the allowable linear heat rate of the fuel rods of about .5 kW/foot which affects the peaking factor and axial offset limits. This requires changes to the basis of Technical Specification 3.5.2 "Control Rod Insertion Limits" and to Technical Specification 3.11 "Continuous Power Distribution Monitoring."

The Main Steam Line Break event (MSLB) was reanalyzed to model the injection of borated water through a single injection path and to permit a reduced boron concentration for the water in the safety injection lines. A single injection path results from the impact of environmental qualification concerns on MCC-3 which could affect operability of safety injection valve MOV 850 C for a MSLB outside containment. This assumption in the analysis does not affect any technical specifications. However, the existing technical specifications

require the safety injection lines to be maintained at the technical specification boron concentration for the Refueling Water Storage Tank. Leakage at the interface of the safety injection system and the main feedwater system dilutes the water contained in the lines and required frequent recirculation of the safety injection system. To account for the dilution of this water and determine an acceptable limit, SCE had Westinghouse reanalyze this event. The reanalysis determined that a boron concentration of 1500 ppm for the water in the safety injection lines was acceptable. The changes in boron concentration are reflected in revised T.S.'s 3.3.3 and 4.1.1. Changes were also made where appropriate to incorporate standard technical specification format. A correction from the previous supplement was made in Table 4.1.2 by moving "RWST Contained Water Volume" to Item Number 16.

The reanalysis also accounts for the delay in safety injection delivery time due to postulated voltage dip. During the Cycle 10 outage, a revised electrical calculation indicated that following a SIS actuation signal with the worst postulated combination of non-essential and safety loads running or starting, the 480V Switchgear 1 and 2 would experience a voltage dip which would result in a delay in starting of certain 480V motors of 4.2 seconds. These motors include the safety injection system valves MOV-850 A and B. A delay in opening MOV 850 A and B impacts the SI delay time assumed in the safety analysis (MSLB and LOCA). However, margin in the analysis prior to Cycle 10 would have allowed opening of MOV-850 A and B to be delayed by 4.2 seconds.

A summary of the delay times relevant to the LOCA analysis prior to Cycle 10 and as analyzed for Cycle 10 is presented below:

<u>Previous SI Delay Time (Seconds)</u>	<u>Current SI Delay Time (Seconds)</u>	<u>Reason for Delay</u>
1	5.75	Time to reach SI setpoint and signal processing.
11	11	MFW pump trip/D.G. start
9.1	10	MFW pump restart/MOV 850 A,B,C opening.
2.1	6.7	Line fill and miscellaneous.
0	5.0	Allowance voltage dip during motor starting.
3.5	0	Identified available margin.
<u>0.8</u>	<u>0</u>	Margin attributable to PCT limit.
27.5	38.45	Total Assumed Delay Time available from analysis.

The differences between the previous analysis and current analysis are due to several factors. The increase in the delay time to reach the SI setpoint is due to the way the transient is modelled by Westinghouse. The additional time to reach the SI setpoint and for signal processing have been added to the analysis since Westinghouse does not have the containment high pressure SI

setpoint modelled. While the containment high pressure trip would come in almost immediately, the additional time allows a conservative time for the pressurizer pressure to reach the SI setpoint. The time also includes an increased allowance for signal processing. The actual delay time would be less than 1 second. The increase in MFW Pump restart/MOV 850 A, B, C opening is due to this part of the delay being modelled by Westinghouse as a step function of 100% on/open. The 9.1 second figure reflects the time to effective full flow instead of 100% on/open. Similarly, the 2.1 vs. 6.7 seconds for line fill and miscellaneous is due to taking credit in the old analysis for line fill prior to the MFW pumps and MOV's being 100% on/open. The new analysis credits line fill only after the MFW pump and MOV's are 100% on/open. The 5.0 seconds for voltage dip in the new analysis was not specifically addressed in the old analysis. The 5.0 seconds allows time for the potential 4.2 second delay due to this voltage dip. The previous analysis, however, had sufficient margin including that previously identified, 3.5, and that attributable to not reaching the PCT limit, 0.8 (total available margin of 4.3 seconds), to allow for the 4.2 second voltage dip.

For the MSLB analysis, a summary of relevant delay times is shown below:

<u>Previous MSLB Delay Time (2 Lines Injecting) (Seconds)</u>	<u>Current MSLB Delay Time (1 Line Injecting) (Seconds)</u>	<u>Reason for Delay</u>
1.0	0.5	Signal processing.
11.0	11.0	MFW pump trip/D.G. start.
10.0	10.0	MFW pump restart/MOV 850 A,B,C opening.
<u>0</u>	<u>4.5</u>	Allowance voltage dip during motor starting.
22.0	26.0	Total Assumed Delay Time available from analysis

The differences in delay times for the MSLB event are also attributable to several factors. The signal processing time was reduced to 0.5 seconds to more accurately reflect actual delay times. A 4.5 second delay time for bus voltage dip was allowed to bound the potential delay of 4.2 seconds.

The previous MSLB analysis shown above is that which was in effect in mid-Cycle 9 and assumed 1500 ppm boron concentration in the SI lines. No delay times were assumed for line fill, etc., since there would be no loss of this fluid during this event. Since the only changes in the MSLB analysis since mid-Cycle 9 was a reduction in the number of injection lines, it follows that the Cycle 10 MSLB analysis with the larger SI delay time bounds the mid-cycle 9 analysis. Therefore, the margin in the mid-Cycle 9 MSLB analysis, though not specifically calculated, would have allowed for bus voltage dip of at least 4.5 seconds (i.e., if the mid-Cycle 9 analysis had assumed 26 seconds SI delay time which includes 4.5 seconds for bus voltage dip and more accurately models signal processing, the results would have been more favorable than the Cycle 10 analysis).

The reanalysis of the RCP locked rotor/shaft break analysis has been run assuming that rods would begin to drop at 6.1 seconds into the event. This event credits the 1/loop low flow reactor trip with the RCP breaker open reactor trip being the redundant trip. Since Westinghouse does not have the RCP breaker open reactor trip modeled, this delay time was assumed in the analysis and the breaker overcurrent pump trip (for locked rotor) and undercurrent pump trip (for shaft break) both of which lead to the breaker open reactor trip will be required to respond such that rod drop occurs in at least 6.1 seconds. This analysis is applicable above 50% power. Below that level, the reactor protection system permissives require a 2/3 loop trip instead of a 1/loop trip. However, at power levels below 50%, the loss of a RCP represents only an approximately one third loss of flow while the power level is only half of full power. Loss of a RCP at below 50% power would require manual shutdown per existing T.S. 3.1.2. These requirements are reflected in proposed Technical Specifications 2.1, "Reactor Core," 3.5.1, "Reactor Trip System Instrumentation," and 4.1.1, "Operational Safety Items," to assure that these requirements are met.

Technical Specification 3.11, "Continuous Power Distribution," has been changed to reflect current core parameters in the axial offset equation and has also had the applicability and action statements revised. The revision to the applicability and action statements represents an updating of the T.S. to prevent extended operation at below 90% power with no axial offset monitoring. Extended periods of time in this condition could lead to core limits being exceeded without monitoring.

Similarly, Technical Specification 3.10, "Incore Instrumentation" has had the mode applicability and action statements revised to assure that extended operation without core monitoring does not take place.

The Westinghouse Reload Safety Evaluation for Unit 1 Cycle 10 is included as Attachment 3 to this proposed change and provides details on the revisions to the accident analyses. One event not considered in the Westinghouse report however, is the Boron Dilution Event. SCE is reanalyzing this particular event and will apply the requirements of 10CFR50.59 in completing the review of this event.

#### EXISTING TECHNICAL SPECIFICATIONS

See Attachment 1

#### PROPOSED TECHNICAL SPECIFICATIONS

See Attachment 2.

#### Significant Hazards Consideration Analysis

As required by 10 CFR 50.91(a)(1), this analysis is provided to demonstrate that this proposed license amendment to 1) revise the safety injection line boron concentration limit and surveillances of the refueling water storage tank and safety injection lines, 2) to change values of specific power and  $F_Q$  to reflect current accident analysis limits, 3) provide changes to reflect new analyses for locked rotor/shaft break events, and 4) to revise applicability statements to preclude potential operation in an unanalyzed condition represents a no significant hazards consideration. In accordance

with the three factor test of 10 CFR 50.92(c), implementation of the proposed amendment was analyzed using the following standards and found not to:

- 1) involve a significant increase in the probability or consequences for an accident previously evaluated; or
- 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.

### Analysis

Conformance of the proposed amendments to the standards for a determination of no significant hazard as defined in 10 CFR 50.92 (three factor test) is shown in the following:

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

Response: No

Operation of the facility in accordance with the proposed revisions to Sections 3.3.3 and 4.1.1 will not increase the probability of an accident previously evaluated because these revisions are limited to the refueling water storage tank (RWST) and safety injection (SI) line. Both these components are part of accident mitigation systems and thus changes will not result in increased probability of an accident. The new safety injection line boron concentration limit has been analyzed, as shown in Attachment 3, and the results demonstrate continued compliance with regulatory acceptance criteria for the applicable accident (i.e., main steam line break) and thus no increase in accident consequences will occur. Changes to the surveillances for these components ensure that safety system parameters are properly monitored and thus will not cause increased consequences.

The proposed changes to Sections 3.5.2 and 3.11 will also not increase the probability nor consequences of an accident previously evaluated. The changes to the specific power and  $F_0$  are being implemented to reflect reanalysis of the LOCA due to core reload and increased steam generator tube plugging. The values were determined by performing analyses with specific acceptance criteria previously established and assuring that even considering the changes in core design and steam generator plugging, the criteria continued to be met. Specific limits and analyses are described in detail in the Attachment 3 report.

Changes to T.S. 2.1, 3.5.1 and 4.1.1 are also being implemented to assure that the consequences of a RCP locked rotor/sheared shaft event do not exceed previously established acceptance criteria. Credit for the RCP breaker open reactor trip is taken to provide redundancy to the low flow trip. The use of this trip is reflected in these T.S. changes. Therefore, the probability or consequences of this event will not increase.

Changes to the applicability and action statements of T.S. 3.10 and 3.11 assure that the reactor is not operated for extended periods when core monitoring is not performed. This change will increase the assurance that safety limits are being met and therefore does not increase the probability or consequences of any accidents.

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 proposed changes to the SI line boron concentration (3.3.3), SI line surveillance (4.1.1) and RWST surveillance (4.1.1) all address the ability of the plant to mitigate previously identified accident scenarios. Failures of these systems will not result in new accidents. Therefore, it is concluded that operation of the facility in accordance with this proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Similarly, changes to Sections 3.5.2 and 3.11 address the ability of the plant to mitigate previously evaluated accidents. The change in value of  $F_Q$  and specific power are being made to assure that previously analyzed accident analyses remain valid. Details on the specific accidents analyzed are contained in the Attachment 3 report.

Changes to T.S. 2.1, 3.5.1 and 4.1.1 to reflect analysis of the RCP locked rotor/sheared shaft event assure that safety limits for this event are not exceeded. No new accidents will be created due to these changes.

Changes to T.S. 3.10 and 3.11 assure that the reactor remains in a condition previously analyzed. Therefore, no new accidents are created.

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

Response: No

Changing the SI line (4.1.1) and RWST (4.1.1) surveillances have no impact on margins of safety as they do not affect the performance of plant safety equipment. Changing the SI line boron concentration (3.3.3) has been shown through safety analysis (Attachment 3) to meet regulatory acceptance criteria for applicable postulated accidents and, therefore provides an acceptable margin to safety. Therefore, it is concluded that operation of the facility in accordance with these proposed changes does not involve a reduction in a margin of safety.

Similarly, for changes to Sections 3.5.2 and 3.11 regulatory acceptance criteria for applicable postulated accidents has been demonstrated by analyses for the applicable transients. The margin

of safety has not been reduced since the values being changed in these technical specifications are being changed to maintain the margin of safety assumed in the accident analyses.

Changes to T.S. 2.1, 3.5.1 and 4.1.1 assure that the acceptance criteria for the RCP locked rotor/sheared shaft event are met. By meeting these acceptance criteria, the margin of safety has not been changed.

For changes to the applicability and action statements of T.S.'s 3.10 and 3.11, the margin of safety for various accidents is further assured. By not allowing operation of the reactor for extended periods without monitoring, the margin of safety is verified.

#### SAFETY AND SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

Based on the preceding analysis, it is concluded that: (1) Proposed Change No. 204 does not involve 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.

#### Attachments

Attachment 1 - Existing Specifications

Attachment 2 - Proposed Specifications

Attachment 3 - Reload Safety Evaluation, San Onofre Nuclear Generating Station, Unit 1, Cycle 10, March 1989, Revision 1, Edited by J. Skaritka. (This report is a more complete version of the report submitted with Revision 1 of this proposed change and completely supersedes that report.)

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