

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

SUPPLEMENTAL SAFETY EVALUATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

STATION BLACKOUT RULE (10 CFR 50.63)

SOUTHERN CALIFORNIA EDISON COMPANY, INC.

SAN ONOFRE, UNITS NO. 2 AND 3

DOCKET NOS. 50-361 AND 50-362

1.0 INTRODUCTION

The NRC staff's Safety Evaluation (SE) pertaining to the licensee's initial responses to the Station Blackout (SBO) Rule, 10 CFR 50.63, was transmitted to the licensee by letter dated February 6, 1992. The staff found the licensee's proposed method of coping with an SBO to be acceptable, subject to the satisfactory resolution of seven recommendations which were itemized in the staff's SE. The licensee responded to the staff's SE, and specifically to the recommendations, by letters from R. Ornelas and R. M. Rosenblum dated March 12, 1992, and June 11, 1992, respectively.

2.0 EVALUATION

The licensee's response to the staff's recommendations are evaluated below.

2.1 <u>Class IE Batteries (SE Section 2.2.2)</u>

SE Recommendation

9209240216 920914

PDR

ADOCK 05000361

PDR

The licensee should confirm that the calculations used to determine the battery capacity conform to IEEE Std. 485, including a 10 to 15 percent design margin to compensate for less than optimum operating conditions. Batteries "A" and "B" should have sufficient design margin as required by IEEE Std. 485. Moreover, the licensee should consider the full inverter current associated with the end of duty cycle voltage. Also, the licensee should justify that the instrumentation lost during load shedding would not affect the operator's ability to monitor the status of the plant during the 4-hour coping period. If adequate capacity cannot be demonstrated, other measures should be taken to ensure that the batteries have sufficient capacity to cope with and recover from a 4-hour SBO event. The analysis confirming that the battery has adequate capacity should be included in the documentation supporting the SBO submittals that is to be maintained by the licensee.

<u>Licensee Response</u>

In response to the above staff concern, the licensee stated that the battery capacity calculation methodology is consistent with the guidance of NUMARC 87-00 and the requirements of 10 CFR 50.63. The licensee has committed to reperform the battery calculations by September 30, 1992. For the battery capacity calculations, the licensee states that plant operating procedures require visual inspection of the batteries during each shift. Any low battery voltages will cause an alarm. Any unanticipated discharge and drop in battery voltage would trigger the low battery voltage alarm, and alert the Control Room operators. The licensee further states that based on their operating experience and existing battery program, the Class IE batteries are maintained at optimum operating condition. The licensee states that, as a part of their design basis review, they have performed an extensive review of the loads on the Class IE DC system since their submittal of September 12, 1991. The licensee also states that the results of their review will require changes to the SBO load profile as previously submitted. The load changes from the design basis review will be incorporated into the SBO supporting documentation. Preliminary results of incorporating the required changes show that the new profiles will be bounded by the previously submitted profiles and will provide a design margin of approximately 8 percent. The licensee also assumed a 25 percent aging margin and an 11 percent temperature margin based on an electrolyte temperature of 60°F. The licensee maintains the battery rooms ambient temperature close to 77°F. Also, the licensee has added a 5 amp load to all load profiles to accommodate future design modifications. The licensee concludes that their Class IE batteries will continue to have adequate capacity to cope with and recover from a 4-hour SBO event.

With regard to inverter current, the licensee's calculations use the measured normal operating inverter currents (not the full rated inverter currents) when generating the load profiles. The licensee concludes that the SBO load profiles resulting from their ongoing design basis review will include the measured normal operating inverter currents adjusted to the minimum expected battery voltages.

With regard to load shedding, the licensee states that the core protection calculators (CPCs) are the only loads proposed to be shed from the inverters. The CPCs monitor reactor core parameters to ensure operating conditions are maintained within the plant design basis. The CPCs will generate a reactor trip signal if reactor parameters are outside the design basis. The licensee further states, that at the onset of an SBO event, the CPCs will generate a reactor trip signal and shut down the plant. (Deenergizing the CPCs will also result in a reactor trip.) The licensee concludes, therefore, that the reactor will not be operating during an SBO event. Consequently, the CPCs, having fulfilled their safety function, will not be required for the remainder of the SBO event and can be disconnected from the inverters without affecting the operator's ability to monitor plant status during the 4-hour coping period.

<u>Staff Evaluation</u>

The staff finds that the licensee has adequately addressed the staff's concerns and has provided clarifications pertaining to the Class 1E battery capacity. The licensee states that a revised load profile will be incorporated into the battery calculation by September 30, 1992. Based on the above, the staff accepts the licensee's assumptions provided the licensee ensures that all SBO loads are conservatively represented. The licensee should include the results of the battery capacity reanalyses and the referenced documents for the battery maintenance program, with the documentation that is to be maintained by the licensee in support of the SBO submittals.

2.2 Effects of Loss of Ventilation (SE Section 2.2.4)

2.2.1 <u>Inverter Room, (Distribution Rooms), Switchgear Room, Computer Room,</u> <u>Control Room, and Control Room Cabinet Area (SE Section 2.2.4.2)</u>

<u>SE Recommendation</u>

The licensee should reevaluate the temperature transient analysis for each of the above dominant areas of concern (DAC) taking into account the nonconservatism as identified in the SAIC TER. With respect to the initial room temperature used for the analysis in each DAC, the licensee should use a value corresponding to the Technical Specification (TS) temperature limit or the maximum value allowed under an administrative procedure. If the licensee's administrative procedure does not specify an operating temperature limit, the licensee should establish an administrative procedure or revise the existing procedure to maintain the temperature in each of the DAC at or below the initial room temperature used in the temperature transient analysis.

Licensee Response

In its response dated June 11, 1992, the licensee indicated that it had reviewed the comments as identified in SAIC's TER and provided detailed justifications for the input parameters to be used in the revised heat-up calculations for the DAC. The 11 revised heat-up calculations will be provided by February 11, 1993. In addition, the licensee indicated that administrative controls and/or procedures will be implemented to ensure that the temperatures in these DAC are maintained below the 11 maximum values specified in the UFSAR.

<u>Staff Evaluation</u>

Based on the licensee's commitments, and the staff's review of the licensee's bases for the input parameters to be used in the revised heat-up calculations, the staff finds the licensee's response acceptable. Therefore, this SER issue related to effects of loss of ventilation during a SBO event at San Onofre, Units 2 and 3 is resolved.

2.2.2 <u>Cabinet Doors (SE Section 2.2.4.2)</u>

<u>SE Recommendation</u>

The licensee should provide a procedure which will require the operators to open instrument cabinet doors within 30 minutes following an SBO event, in accordance with the guidance described in NUMARC 87-00.

<u>Licensee Response</u>

In the response, the licensee stated that it will incorporate the appropriate changes to the Units 2 and 3 Emergency Operating Instructions (EOIs) once its review of the loss of ventilation for the control building rooms is completed. These changes, along with the necessary EOI changes needed to implement the SBO requirements, will be coordinated with its next review of the EOIs currently scheduled for June 30, 1993.

<u>Staff Evaluation</u>

Based on its review, the staff finds the above licensee's commitment acceptable and, therefore, considers this SE issue concerning the opening of the instrument cabinet doors resolved.

2.2.3 <u>Containment Heat Loads (SE Section 2.2.4.3)</u>

<u>SE Recommendation</u>

The licensee should recalculate the expected containment heat loads resulting from an assumed reactor coolant system (RCS) leak rate which is consistent with the guidance described in NUMARC 87-00 (25 gpm per reactor coolant pump (RCP) seal plus the TS leakage limit of 11 gpm for the RCS) and verify that these expected heat loads are enveloped by the LOCA/HELB temperature profiles.

<u>Licensee Response</u>

With regard to the RCP seal leak rate, the licensee referred to the answer to Question 2.1 of NUMARC 87-00, Supplemental Questions and Answers in which the answer states, "Leakage rates lower than 25 gpm for PWRs or 18 gpm for BWRs may be used provided a justification exists and the NRC is informed that lower rates are being utilized." The licensee stated that San Onofre, Units 2 and 3, RCP seals are capable of withstanding a 4-hour SBO event without leaking. Vender RCP seal data, including actual test results, was provided to demonstrate that seal leakage will not increase as a result of a 4-hour SBO event. Therefore, the licensee's analysis assumed that RCP seal leakage will not increase during an SBO event, and that assuming only the allowable Technical Specification (TS) RCS leak rate of 11 gpm for an SBO event is appropriate for San Onofre, Units 2 and 3. The licensee further indicated that following resolution of Generic Issue 23, the above assumed RCP seal leakage rate will be reviewed to ensure consistency with this resolution. In addition, the licensee indicated that it did not have a formal calculation documenting the containment heat loads and environmental response to a 4-hour SBO event at the assumed RCS leakage rate of 11 gpm. Combustion Engineering

(CE) had performed an earlier plant response analysis but did not generate associated containment pressure/ temperature calculations. Based on the CE plant response analysis, the licensee utilized an engineering evaluation to conclude that the LOCA/HELB temperature profiles would envelop the SBO heat loads. It will formalize its engineering evaluation by performing an analysis to demonstrate that the LOCA/HELB temperature profiles envelop the existing heat loads and containment conditions due to an SBO event. This analysis will be completed by February 11, 1993, and subsequently incorporated into the SBO analysis supporting documentation.

- 5 -

<u>Staff Evaluation</u>

Based on its review, the staff finds the licensee's commitment acceptable with one exception. With regard to the RCP seal leakage used for the SBO containment heat-up analysis, it is the staff's position (as indicated in SE Section 2.2.6) that the licensee should use 25 gpm per RCP in addition to the 11 gpm TS RCS leakage. The licensee should be aware that the final resolution of Generic Issue 23 may result in additional requirements with regard to RCP seals and their leak rate assumptions.

2.3 Proposed Modifications (SE Section 2.4)

SE Recommendation

The licensee should include a full description including the nature and objectives of the proposed modifications identified above in the documentation that is to be maintained by the licensee in support of the SBO submittals.

Licensee Response

The licensee states that they will incorporate into the supporting documentation descriptions of any plant modifications required for SBO that may be identified in the future. The licensee further states in their conclusion, and in their letter dated April 17, 1989, that they have committed to complete procedure changes needed to implement the SBO requirements within 1 year of receipt of the SBO SE. However, the licensee indicated in their comments on the instrument cabinet doors recommendation that the revisions to the EOIs must be coordinated with their schedules for operator training and requalification examinations. Therefore, the necessary EOI changes to implement the SBO requirements will be completed by June 30, 1993.

Staff Evaluation

Based on its review, and the licensee's commitment, the staff finds the licensee's response acceptable.

2.4 Quality Assurance and Technical Specifications (SE Section 2.5)

<u>SE Recommendation</u>

The licensee should verify and confirm that the SBO equipment is or will be covered by an appropriate QA program consistent with the guidance of Appendix

A to RG 1.155. Verification that such a program is in place should be included as part of the documentation supporting the SBO Rule response.

<u>Licensee Response</u>

The licensee states that the San Onofre, Units 2 and 3, SBO equipment analysis documentation lists all the equipment and instrumentation credited for the 4hour coping duration. The equipment and instrumentation listed are Quality Class II and are part of their 10 CFR 50 Appendix B QA program. The licensee further stated that any additional lighting that may be required for SBO will be incorporated into their QA program. The licensee concludes that this satisfies the recommendations of Appendix A to RG 1.155.

<u>Staff Evaluation</u>

Based on its review, and the licensee's commitment, the staff finds the licensee's response acceptable and considers the above cited issue resolved.

2.5 EDG Reliability Program (SE Section 2.6)

<u>SE Recommendation</u>

The licensee should implement an emergency diesel generator (EDG) reliability program which as a minimum meets the guidance of RG 1.155, Section 1.2. Confirmation that such a program is in place or will be implemented should be included in the documentation supporting the SBO submittals that is to be maintained by the licensee.

Licensee Response

The licensee states that they are completing the EDG reliability program and its governing procedure. Both the program and the governing procedure will be implemented by February 11, 1993. The licensee also states that in addition to describing the individual elements of the program, the EDG reliability procedure will also detail the organizational responsibilities and the required management oversight functions. Once implemented, the licensee states that the EDG reliability program will satisfy the requirements of NUMARC 87-00 Appendix D, and RG 1.155. In addition to the above, the licensee has included the EDGs in their Reliability Centered Maintenance (RCM) program and has analyzed the EDG's maintenance program using their RCM methodology. The licensee further states that potential changes to the EDG maintenance program due to the EDG RCM analysis are currently under review. The licensee concludes that including the EDGs in the RCM program will provide additional insurance that the EDG target reliability will be achieved.

<u>Staff Evaluation</u>

Based on its review, and the licensee's commitment, the staff finds the licensee's response acceptable.

3.0 <u>SUMMARY AND CONCLUSION</u>

The staff has reviewed the licensee's response to the staff's SE pertaining to the SBO Rule (10 CFR 50.63) in their letters dated March 12, 1992, and June 11, 1992. The licensee has committed to re-perform battery calculations by September 30, 1992; revise its EOIs for any required modifications and for loss of ventilation by June 30, 1993; and perform an analysis to demonstrate that the LOCA/HELB temperature profiles envelop the expected heat loads and containment conditions due to an SBO event by February 11, 1993. Based on these commitments and the satisfactory resolution of any issues resulting from these commitments, the staff finds the licensee's responses to be acceptable. For the battery calculations, the licensee needs to ensure that the SBO loads are conservatively represented. For evaluation of containment heat loads, the licensee should use 25 gpm per RCP for the RCP seal leakage in addition to the 11 gpm RCS TS leakage. This Supplemental SE documents the NRC's final regulatory assessment of the licensee's proposed conformance to the SBO Rule. It is the staff's position that the licensee must be in full compliance with the SBO Rule within two years after receipt by the licensee of this Supplemental SE, in accordance with 10 CFR 50.63(c)(4). Therefore, the licensee should take the necessary actions to ensure complete compliance with the SBO Rule as indicated in the staff SE and Supplemental SE. Also, the licensee should retain all supporting documentation in the SBO file.

Principal Contributors: C. Thomas, SELB D. Shum, SPLB

Date: September 14, 1992

the necessary actions to ensure complete compliance with the SBO Rule as indicated in the staff's SE and Supplemental SE. Also, the licensee should retain all supporting documentation in the SBO file.

Sincerely,

Theodore & Imay

Theodore R. Quay, Director Project Directorate V Division of Reactor Projects III/IV/V Office of Nuclear Reactor Regulation

Enclosure: SBO Supplemental SE

cc w/enclosure: See next page

DISTRIBUTION:Docket FileNRC & Local PDRsBBogerMVirgilioMFieldsDFosterACRS (10)(P315)PDV p/fCMcCrackenCBerlinger*See previous concurrence

PDV r/f TQuay OGC (15B18) KPerkins, RV

OFC	PDV/LA	PDV/PM	*SPLB	*SELB	PDV/D
NAME	DFoster	MFi#Ads	{CMcCracken	¦CBerlinger	¦TQuay
DATE	9/11/92	19/1/92	¦09/09/92	09/10/92	9/14/92

OFFICIAL RECORD COPY

· • • •

DOCUMENT NAME: S068599.LTR

September 14, 1992

Docket Nos. 50-361 and 50-362

Mr. Harold B. Ray Senior Vice President Southern California Edison Irvine Operations Center 23 Parker Street Irvine, California 92718 Mr. Edwin A. Guiles Vice President Engineering and Operations San Diego Gas & Electric Co. 101 Ash Street San Diego, California 92112

Gentlemen:

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3 STATION BLACKOUT ANALYSIS (TAC NOS. M68599 AND M68600)

DISTRIBUTION:

Docket File NRC & Local PDRs PDV Reading File BBoger MVirgilio TQuay MFields DFoster OGC, 15B18 ACRS (10), P-315 PDV Plant File KPerkins, RV CMcCracken, 8D1 CBerlinger, 8D22