

LICENSEE EVENT REPORT (LER)

Facility Name (1)										Docket Number (2)					Page (3)														
San Onofre Nuclear Generating Station (SONGS) Unit 2										0	5	0	0	0	3	6	1	1	of	0	3								
Title (4)																													
Wrong Boron Sample Used for Shutdown Margin Surveillance																													
EVENT DATE (5)			LER NUMBER (6)				REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)																			
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES			DOCKET NUMBER(S)																	
0	7	0	4	9	7	9	7	0	1	1	0	0	0	7	3	0	9	7	SONGS Unit 3			0	5	0	0	0	3	6	2
OPERATING MODE (9)		5		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (CHECK ONE OR MORE OF THE FOLLOWING) (11)																									
POWER LEVEL (10)		0 0 0		20.402 (b)			20.405 (c)			50.73 (a) (2) (iv)			73.71 (b)																
				20.405 (a) (1) (i)			50.36 (c) (1)			50.73 (a) (2) (v)			73.71 (c)																
				20.405 (a) (1) (ii)			50.36 (c) (2)			50.73 (a) (2) (vii)			other (Specify in																
				20.405 (a) (1) (iii)			X 50.73 (a) (2) (i)			50.73 (a) (2) (viii) (A)			Abstract below and																
				20.405 (a) (1) (iv)			50.73 (a) (2) (ii)			50.73 (a) (2) (viii) (B)			in text)																
				20.405 (a) (1) (v)			50.73 (a) (2) (iii)			50.73 (a) (2) (x)																			

LICENSEE CONTACT FOR THIS LER (12)

NAME							TELEPHONE NUMBER								
R.W. Krieger, Vice President, Nuclear Generation							AREA CODE			-					
							7	1	4	3	6	8	6	2	5

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

Yes (If yes, complete EXPECTED SUBMISSION DATE)					X No		EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines.) (16)

Technical Specifications for SONGS 2 and 3 require Edison to verify the shutdown margin (SDM) by performing an SDM calculation once every 24 hours when a reactor is in Modes 3, 4 or 5. This includes consideration of the reactor coolant system (RCS) boron concentration. Between SDM calculations, two channels of instrumentation provide continuous confirmation that the reactor remains shut down. If one channel becomes inoperable, an SDM calculation is required within 4 hours and once per 12 hours thereafter.

On 7/4/97 with Unit 3 in Mode 5, instrumentation channel 1 was declared inoperable. The boron concentration used by the operator (utility, licensed) making the initial SDM calculation was erroneously from the refueling water storage tanks (RWST), not from the RCS. Consequently, the required 4 hour SDM calculation was not completed correctly. Edison is reporting this in accordance with 10CFR50.73(a) (2) (i).

This event was caused by cognitive personnel error in using RWST boron concentration, and by procedural error (inadequate procedure -- i.e., the surveillance procedures did not specify how recent must be the RCS boron sample results).

The operator was coached in the need for attention to detail. Edison has revised the procedures for performing SDM calculations.

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Description of Event:

Plant: San Onofre Nuclear Generating Station (SONGS) Units 2 and 3
 Reactor Vendor: Combustion Engineering
 Event Date: July 4, 1997
 Event Time: 10:00
 Mode: both Units were in Mode 5, Cold Shutdown
 Pressure: Unit 2: atmospheric
 Unit 3: depressurizing from approximately 130 psia to atmospheric
 Temperature: Unit 2: approximately 109 degrees F
 Unit 3: approximately 98 degrees F

Technical Specifications (TS) Surveillance Requirements (SRs) 3.1.1.2 and 3.1.2.1 for SONGS 2 and 3 require Edison to verify the shutdown margin (SDM) by performing a reactivity balance calculation (SDM calculation) once every 24 hours when a reactor is shutdown in Modes 3, 4 or 5. The minimum SDM ensures that the reactor will be maintained sufficiently subcritical with control rods inserted. Verification of the SDM includes consideration of the reactor coolant system (RCS) [AB] boron concentration.

Between SDM calculations, two channels of source range monitoring excore instruments [IG] provide continuous confirmation that the reactor remains subcritical (shut down). Each channel contains a boron dilution alarm to provide Control Room operators with audible annunciation of loss of SDM due to a postulated boron dilution event. If one source range monitoring channel becomes inoperable, TS Limiting Condition for Operation (LCO) 3.3.13 Action A.2 requires Edison to verify SDM within 4 hours and once per 12 hours thereafter by performing an SDM calculation. Licensee Controlled Specification 3.3.111 requires immediate initiation of an alternate boron dilution detection method.

On 7/4/97 at 0915 with Unit 3 in Mode 5, Control Room operators declared source range monitoring channel 1 inoperable due to spiking, and immediately began an SDM calculation as required. The boron concentration used by the Control Room operator (utility, licensed) for this calculation was erroneously from a sample drawn from the refueling water storage tanks (RWST), not from the RCS. Consequently, the required 4 hour reactivity balance calculation was not completed correctly. Edison is reporting this occurrence in accordance with 10CFR50.73(a)(2)(i).

Control Room operators also immediately began an alternate boron dilution monitoring method, as required, by making and recording hourly readings of the 4 log power nuclear instrumentation [IG] safety channels and comparing each reading to previous readings, which confirmed that no significant reactivity change or trend was occurring.

Edison continued to perform 12 hour SDM calculations and hourly safety channel verifications as required while Unit 3 source range monitoring channel 1 remained inoperable. Consistent with SONGS practice, RCS boron samples continued to be obtained on a 24 hour frequency.

Late on 7/7/97, a Control Room operator (utility, licensed) questioned whether samples taken every 24 hours were sufficient for a calculation being performed every 12 hours. Edison management determined early on 7/8/97 that a separate RCS boron sample should have been obtained for each 12 hour SDM calculation for the period 7/4/97 to 7/7/97. As this has been a standard SONGS practice, it is likely that TS SRs for previous instances of inoperable source range monitoring channels were not sufficiently performed in the past.

Cause of the Event

Cognitive personnel error (utility, licensed), by using RWST boron concentration instead of RCS boron concentration for the initial Unit 3 SDM calculation on 7/4/97.

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Procedural error (inadequate procedure) did not adequately control the use of RCS boron concentration samples for completing the 12 hour SRs of LCO 3.3.13 Action A.2 (i.e., the surveillance procedures did not specify how recent must be the RCS boron sample results).

Corrective Actions

The operator who inadvertently used RWST boron concentration to verify SDM has been coached in the need for attention to detail.

When it was determined a separate RCS boron concentration sample was required for each 12 hour surveillance, a sample was immediately obtained and the SDM verified. Unit 3 source range monitoring channel 1 was declared operable before the next 12 hour SDM verification was required.

Edison has revised the procedures for performing SDM calculations to advise operators that, when verifying SDM for source range monitoring channel inoperability, the RCS boron sample must have been obtained within the preceding 12 hours.

Safety Significance

Unit 3 source range monitoring channel 2 remained operable and capable of annunciating a boron dilution accident during the time that channel 1 was inoperable. Also, Edison performed hourly verifications that a boron dilution event was not in progress by comparing log power safety channel readings over time.

Normally when shutdown, at least one boron dilution alarm is operable. When only one alarm is operable, TS require immediate suspension of all operations involving positive reactivity additions. This action further reduces the probability of an inadvertent dilution event. On those rare occasions when both alarms are inoperable, operators are still monitoring the control boards. Operators would detect symptoms of a slowly progressing boron dilution event in sufficient time to prevent an inadvertent return to power.

When RWST boron concentration was inadvertently used in place of RCS boron concentration to verify SDM on 7/4/97, the RWST boron concentration was 2723 ppm. The RCS boron concentration as measured from the most recent hot leg sample was 2724 ppm, and as measured from the most recent shutdown cooling system sample was 2719 ppm. These concentrations are the same within the 1 percent accuracy of the boron measurement analysis.

Therefore, this occurrence had no safety significance.

Additional Information

There have been no previous events at SONGS in the last three years involving inadequate performance of SDM surveillances.