

Southern California Edison Company

P O BOX 128

SAN CLEMENTE, CALIFORNIA 92674-0128

May 25, 1994

R. W. KRIEGER
VICE PRESIDENT
NUCLEAR GENERATION

TELEPHONE
714-368-6255

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Gentlemen:

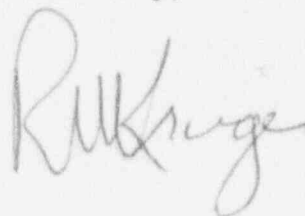
Subject: Docket No. 50-362
30-Day Report
Licensee Event Report No. 94-001
San Onofre Nuclear Generating Station, Unit 3

Pursuant to 10 CFR 50.73(a), this submittal provides the required 30-day written Licensee Event Report (LER) for a channel of containment emergency sump level indication being inoperable longer than allowed by the Technical Specifications. This condition did not affect the health or safety of the public or plant personnel.

As discussed with Howard Wong (NRC Region IV, Walnut Creek Field Office) on April 20, 1994, this report was delayed to allow a complete report to be submitted.

If you require any additional information, please so advise.

Sincerely,



Enclosure: LER No. 94-001

cc: L. J. Callan, Regional Administrator, USNRC Region IV
K. E. Perkins, Jr., Director Walnut Creek Field Office, USNRC Region IV
J. A. Sloan, USNRC Senior Resident Inspector, Units 1, 2 and 3
M. B. Fields, NRC Project Manager, San Onofre Units 2 & 3
Institute of Nuclear Power Operations (INPO)

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LICENSEE EVENT REPORT (LER)

Facility Name (1) SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 3
 Docket Number (2) 0 5 1 0 0 0 3 6 2
 Page (3) 1 of 0 5
 Title (4)

Containment Emergency Sump Level Instrument Inoperable Longer than Allowed by Technical Specifications

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 4	1 2	9 4	9 4	0 1 0 1	0 0	0 5	2 5	9 4	NONE	0 5 1 0 0 0 1 1		

OPERATING MODE (9)

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)

POWER LEVEL (10)	0 9 6	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: R. W. Krieger, Vice President, Nuclear Generation
 TELEPHONE NUMBER: AREA CODE 7 1 4 3 6 8 - 6 2 5 5

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS
X	I D	I M O D	I X O 6	N					

SUPPLEMENTAL REPORT EXPECTED (14)

Expected Submission Date (15)
 Month Day Year

Yes (If yes, complete EXPECTED SUBMISSION DATE) X NO

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On April 16, 1994, with the Unit 3 in Mode 1, at 96 percent power, channel B containment emergency sump level (CESL) lumigraph indicator 3LI-9389-2 was observed with no light bars illuminated. In accordance with station procedures, operators (Utility, licensed) verified channel B CESL indication on the Qualified Safety Parameter Display System (QSPDS). Based on a normal QSPDS indication, operators believed that the indication was operable and only the lumigraph was inoperable. On April 20, 1994, during maintenance for 3LI-9389-2, it was discovered that a signal converter in the instrument loop had failed, not 3LI-9389-2.

Technical Specification (TS) 3.3.3.6 "Accident Monitoring Instrumentation" and TS 3/4.5.2, "ECCS Subsystems, T(ave) greater than 350 degrees," allow one train of CESL to be inoperable for 7 days and 72 hours respectively. Subsequent review of plant historical data determined that the signal converter had failed on April 12, 1994. Therefore, Edison realized that the out of service time limits of TS 3.5.2 and 3.3.3.6 had been exceeded and is reporting this occurrence in accordance with 10CFR50.73(a)(2)(i).

Edison replaced the failed signal converter on April 20, 1994. Additionally, because the design of the CESL input to QSPDS delayed diagnosis of the failed signal converter, Edison will evaluate and implement potential changes to QSPDS if appropriate.

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Plant: San Onofre Nuclear Generating Station Unit 3
 Reactor Vendor: Combustion Engineering
 Event Date: April 12, 1994
 Discovery Date: April 20, 1994
 Mode: 1, Power Operation
 Power: 96%

On April 16, 1994, Edison misdiagnosed the cause of an apparently failed control board indicator (a Sigma Lumigraph [IP,LI] for Containment Emergency Sump Level). On April 20, 1994, Edison discovered the actual cause and realized that the allowed out of service time limits of Technical Specifications (TS) 3/4.5.2, "ECCS Subsystems, T(ave) greater than 350 degrees," and (TS) 3/4.3.3.6, "Accident Monitoring Instrumentation," had already been exceeded. These occurrences are reportable in accordance with 10CFR50.73(a)(2)(i).

DISCUSSION:

Containment emergency sump level (CESL) is monitored by 2 instrument channels, both of which display in the control room. CESL indication is displayed on the control room panel CR-57 (by Sigma Lumigraphs Sigma Lumigraph Company, Model 9270.03)) and on the Qualified Safety Parameter Display System (QSPDS) [ID,CPU], either of which satisfy the TS 3/4.3.3.6, operability requirements for CESL. Operators observe the sigma lumigraphs during the performance of routine control board walkdowns. With a normal, empty containment emergency sump, the sigma lumigraph usually displays a single light bar.

As originally designed, the QSPDS includes an alerting feature for failed or out-of-range inputs. Because the normal and emergency sumps are normally empty, the QSPDS sump level inputs (channel A and B for each sump) hover at or slightly below the lower limit of the instrument range. As a result of this design, the QSPDS routinely indicated a failed or out-of-range input for both channel A and B normal and emergency sump level indications, even though these indications were operable. To eliminate this routinely misleading QSPDS display of sump level indication, Edison removed the failed or out-of-range alerting feature from the four sump level inputs in 1985 (Unit 2 - 2/85, Unit 3 - 12/85).

CESL indication also provides a permissive to four emergency core cooling system (ECCS) [BP] mini-flow valves [ISV]. On a high CESL indication, the permissive allows the mini-flow valves to close in the event a recirculation actuation signal (RAS) is received, thereby preventing diversion of emergency core cooling water from the containment emergency sump to the refueling water storage tank. Either channel of CESL indication can enable the permissive, however, both channels are required to be operable for the ECCS subsystems to be considered operable.

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Technical Specification (TS) 3/4.3.3.6, "Accident Monitoring Instrumentation," requires Edison to verify, on a monthly basis, that both channels of CESL indication are operable, and allows one channel to be inoperable for up to 7 days. TS 3/4.5.2, "ECCS Subsystems, T(ave) greater than 350 degrees," requires two independent trains of ECCS subsystems capable of taking suction from the emergency sump upon receipt of a RAS, and allows one train to be inoperable for up to 72 hours.

On Saturday, April 16, 1994, at 0500, during a routine control board walkdown, the channel B CR-57 CESL Sigma Lumigraph (3LI-9389-2) was observed with no light bars illuminated. In response to the lack of indication on 3LI-9389-2, control room operators (utility, licensed) checked the channel B QSPDS CESL indication and noted it was indicating a normal, empty containment emergency sump level of 12 feet. Based on the apparently normal QSPDS CESL indication, operators believed that channel B of emergency sump level functions were operable and all TS requirements were satisfied. As a result of this evaluation, only the repair of the 3LI-9389-2 was requested.

On Wednesday, April 20, 1994, during performance of the maintenance efforts for 3LI-9389-2, it was discovered that the lack of display on 3LI-9389-2 was caused, in fact, by the failure of the channel B level signal converter [IP,IMOD] 3LY-9389-2 and that the sigma lumigraph had not failed. Because this signal converter provides an output to all remaining loop components, its failure had caused the channel B QSPDS CESL indicator and the permissive to the four ECCS mini-flow valves to be inoperable. When the failed signal converter was discovered on April 20, 1994, Edison realized that the instrument loop had been inoperable from April 16, 1994, and the 72 hour allowed out of service time limit of TS 3.5.2 had been exceeded.

Subsequent review of plant historical data recorded by the Critical Functions Monitoring System (CFMS) [ID,CPU] determined that the signal converter for channel B CESL instrument loop had failed on April 12, 1994, at approximately 1836. It can not be conclusively determined if 3LI-9389-2 ceased indicating at that time. Nevertheless, Edison conservatively concluded that the 7 day allowed out of service time limit of TS 3.3.3.6 may have also been exceeded. These conditions are being reported in accordance with 10CFR50.73(a)(2)(i).

CAUSE OF THE EVENT

Failure of CESL Indication

The inoperability of channel B CESL indication and the inoperability of the ECCS mini-flow permissive, were caused by the failure of level signal converter 3LY-9389-2. The level signal converter failure was caused by a failed electrolytic capacitor.

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Recognizing the failure of 3LI-9389-2

On April 16, 1994, when control room operators questioned the lack of indication on the CR-57 channel B CESL sigma lumigraph, the operators checked the QSPDS CESL indication and noted it was displaying a normal, empty containment emergency sump level of 12 feet. As currently designed, QSPDS continues to display a normal, empty sump level with a failed low input, and does not provide indication of the failed input. This design detail was not known by Control Room operators (utility, licensed), who therefore did not recognize that equipment other than the 3LI-9389-2 may have been inoperable. Consequently, on April 16, 1994, operators only requested repair of 3LI-9389-2. When maintenance activities on April 20, 1994 discovered the failed level signal converter, the TS 3.3.3.6 and 3.5.2 out of service time limits were considered to have been exceeded.

CORRECTIVE ACTIONS

The failed signal converter was replaced on April 20, 1994, and channel B of CESL instrument loop returned to operable status.

On April 22, 1994, Edison initiated pre-shift briefings for all operating crews emphasizing the need to evaluate potential TS impact of lumigraphs that have no bars illuminated.

Edison performed an evaluation of QSPDS data points to determine if any other parameters were incapable of distinguishing between a failed input and a normal end of range input. Of the 148 QSPDS data points, Edison confirmed that only the two normal sump level inputs and the two emergency sump level inputs will not identify a failed low input (all points will detect a failed high input). The Operations Division was notified of the evaluation results which are documented in a Site Problem Report (SPR). Potential changes to QSPDS will be evaluated in the SPR review process and implemented under that process, if appropriate.

SAFETY SIGNIFICANCE

As stated above, both channels of CESL instrumentation provide a high sump level permissive to the four ECCS mini-flow valves. The permissive is satisfied when either channel A or channel B is actuated. CESL channel A remained operable between April 12, 1994, and April 20, 1994. Additionally, the RAS actuation attachment to the Loss of Coolant Accident emergency operating instruction requires the operators to ensure the ECCS mini-flow isolation valves are closed. These valves can be closed manually from the control room if they do not close automatically.

Edison completed a risk assessment to evaluate the safety significance of channel B CESL instrumentation being inoperable. This assessment concluded that the increase in core damage frequency and the increase in offsite release probability were both less than $1E-9$. Therefore, there was minimal safety significance for this occurrence.

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ADDITIONAL INFORMATION

There have been no previous LER's associated with the inability of QSPDS to differentiate between a failed low or out-of-range input and a valid plant condition which delayed the proper diagnosis of failed TS required equipment.