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SUBJECT: LER 89-003-00:on 890302,CRIS train B spurious actuation due to switch failure.

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LICENSEE EVENT REPORT (LER)

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

Title (4)

CONTROL ROOM ISOLATION SYSTEM (CRIS) TRAIN "B" SPURIOUS ACTUATION DUE TO SWITCH FAILURE

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 3	0 2	8 9	8 9	--- 0 0 3	--- 0 0		0 3	3 1	8 9	SONGS, UNIT 3	0 5 0 0 0 3 6 2
											0 5 0 0 0

OPERATING MODE (9)	1
POWER LEVEL (10)	0 9 9

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

___ 20.402(b)	___ 20.405(c)	X 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 Abstract below and in text)		
___ 20.405(a)(1)(iii)	___ 50.73(a)(2)(i)	___ 50.73(a)(2)(viii)(A)			
___ 20.405(a)(1)(iv)	___ 50.73(a)(2)(ii)	___ 50.73(a)(2)(viii)(B)			
___ 20.405(a)(1)(v)	___ 50.73(a)(2)(iii)	___ 50.73(a)(2)(x)			

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER AREA CODE
H. E. Morgan, Station Manager	7 1 4 3 6 8 - 6 2 4 1

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
X	V I	R I T	N 3 0 5	NO					

SUPPLEMENTAL REPORT EXPECTED (14)

	Expected Submission Date (15)	Month	Day	Year
___ Yes (If yes, complete EXPECTED SUBMISSION DATE) XX NO				

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

On March 2, 1989, at 2130, with Units 2 and 3 at full power, an actuation of the Control Room Isolation System (CRIS) Train "B" occurred as a result of an instrument failure alarm on radiation monitor iodine/particulate channel RT-7825A. All CRIS Train "B" components were verified to have actuated as required. CRIS was reset and the ventilation lineup was returned to normal at 2205.

The CRIS actuation was due to the failure of a switch within circuit card CRA-44 of the monitor module. The circuit card serves to convert monitor detector pulses to a logarithmic monitor signal output ranging from 10E1 to 10E7 counts per minute (CPM). The switch failure affected the circuit card's signal output in a manner which caused a downscale instrument failure signal, as exhibited by the monitor's strip chart recorder.

The CRA-44 circuit card with the defective switch was replaced, and the monitor was returned to service following satisfactory testing. The failed switch was sent to an outside laboratory for additional analysis. A supplemental report will be submitted if the laboratory analysis is able to identify additional root cause information pertinent to this event.

Plant: San Onofre Nuclear Generating Station
Units: Two and Three
Reactor Vendor: Combustion Engineering
Event Date: 03-02-89
Time: 2130

A. CONDITIONS AT TIME OF THE EVENT:

Mode: 1, Power Operation; Unit 2 at 99% and Unit 3 at 99.5%

B. BACKGROUND INFORMATION:

The Control Room Isolation System (CRIS) and associated Control Room Emergency Air Cleanup System (CREACUS) (EIIS System Code VI) consists of two independent trains of radiation monitors (RT-7824 (Train A) and RT-7825 (Train B)) (EIIS Component Code RIT), emergency ventilation supply (EVS) units (A-206 and A-207) (EIIS Component Code AHU), emergency air conditioning (EAC) units (E-418 and E-419) (EIIS Component Code ACU), and associated emergency isolation dampers (EIIS Component Code BDMP). Each radiation monitor is comprised of a particulate/iodine channel and a noble gas channel. Upon receipt of either a high radiation or instrument failure signal, the dampers operate to direct outside air through the EVS and EAC units, both of which contain filtration units (EIIS Component Code FLT), thus providing purified and cooled air to the control room and minimize exposure to personnel.

C. DESCRIPTION OF THE EVENT:

1. Event:

At 2130 on March 2, 1989, with Units 2 and 3 at full power, a CRIS Train "B" actuation occurred upon receipt of an instrument failure signal on the particulate/iodine channel. All CRIS Train "B" components were verified to have actuated as required. CRIS was reset and the ventilation lineup was returned to normal at 2205.

2. Inoperable Structures, Systems or Components that Contributed to the Event:

Not applicable.

3. Sequence of Events:

TIME	ACTION
2130	CRIS "B" actuation. Monitor 2/3 RT-7825A failed low and declared inoperable.
2151	All CRIS "B" components verified to have actuated as required. Monitor bypassed.
2205	CRIS "B" reset and normal ventilation restored.

4. Method of Discovery:

Control room indications and alarms alerted the operators of the CRIS Train "B" actuation.

5. Personnel Actions and Analysis of Actions:

The operators responded properly to the CRIS Train "B" actuation by: 1) verifying each CRIS Train "B" component actuated as required, and 2) verifying control room radiation levels were normal prior to resetting CRIS and returning the ventilation lineup to normal.

6. Safety System Responses:

All CRIS Train "B" components were verified to have actuated as required.

D. CAUSE OF THE EVENT:

1. Immediate Cause:

The output signal from 2/3 RT-7825 spiked downward to below the instrument failure alarm setpoint, resulting in the CRIS Train "B" actuation.

2. Root Cause:

A diode within circuit card CRA-44 of the monitor module is used to convert the monitor's detector signal pulses to a logarithmic output ranging from 10E1 to 10E7 counts per minute (CPM). In a typical diode circuit, associated circuit elements are used to bias the diode to operate in the desirable output range. Failure of the bias circuit elements in circuit card CRA-44 would affect the diode bias and consequently the signal output. This would result in an instrument failure signal exhibited by the monitor.

The calibration dip switch in circuit card CRA-44 in the monitor module is one such circuit element used to bias the diode. This switch was found to be defective. This was confirmed by removing and installing a jumper across the dip switch and observing the monitor output from March 3 to March 10, 1989. With the dip switch effectively isolated, the monitor was observed to exhibit the proper indications. The observation period was warranted due to the transient spiking signal which caused the actuation, as well as to provide sufficient time to calibrate and align a replacement CRA-44 circuit card.

E. CORRECTIVE ACTIONS:

1. Corrective Actions Taken:

The CRA-44 circuit card with the defective calibration dip switch was replaced, and the monitor was returned to service.

2. Planned Corrective Actions:

The failed switch was sent to an outside laboratory for additional analysis. A supplemental report will be submitted if the laboratory analysis is able to identify additional root cause information pertinent to this event.

F. SAFETY SIGNIFICANCE OF THE EVENT:

There is no safety significance to this event since radiation levels remained normal and all CRIS Train "B" components actuated as required.

G. ADDITIONAL INFORMATION:

1. Component Failure Information:

Radiation monitor 2/3 RT-7825, as well as the circuit card containing the failed calibration dip switch, were manufactured by Nuclear Measurements Corp. The calibration dip switch was manufactured by CTS Corporation, Model No. 206-4.

2. Previous LERs for Similar Events:

CRIS actuations due to dip switch failures have not occurred previously at San Onofre.

3. Results of NPRDS Search:

The NPRDS search did not identify any failures involving the same CTS switches.

Southern California Edison Company

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STATION MANAGER

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March 31, 1989

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

Subject: Docket No. 50-361
30-Day Report
Licensee Event Report No. 89-003
San Onofre Nuclear Generating Station, Units 2 and 3

Pursuant to 10 CFR 50.73(a)(2)(iv), this submittal provides the required 30-day written Licensee Event Report (LER) for an occurrence involving a spurious actuation of the Control Room Isolation System. Since this event involved shared systems between Units 2 and 3, a single report is being submitted in accordance with NUREG-1022. Neither the health and safety of plant personnel nor the health and safety of the public was affected by this occurrence.

If you require any additional information, please so advise.

Sincerely,

H E Morgan

H. E. MORGAN
STATION MANAGER

PKChang/wp
Enclosure: LER No. 89-003

cc: F. R. Huey (USNRC Senior Resident Inspector, Units 1, 2 and 3)

J. B. Martin (Regional Administrator, USNRC Region V)

Institute of Nuclear Power Operations (INPO)

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