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AUTH.NAME AUTHOR AFFILIATION
MORGAN,H.E. Southern California Edison Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-011-01:on 880512,fuel handling isolation system Train A actuated.Caused by failed radiation monitor 2RT-7822 module due to low of power.Analysis found burr on metal flat plate heat sink.Module replaced.W/891030 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 5
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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Southern California Edison Company

SAN ONOFRE NUCLEAR GENERATING STATION

P. O. BOX 128

SAN CLEMENTE, CALIFORNIA 92672

H. E. MORGAN
STATION MANAGER

TELEPHONE
(714) 368-6241

October 30, 1989

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

Subject: Docket No. 50-361
Supplemental Report
Licensee Event Report No. 88-011, Revision 1
San Onofre Nuclear Generating Station, Unit 2

Reference: Letter, H. E. Morgan (SCE) to USNRC Document Control Desk, dated June 13, 1988.

Pursuant to 10 CFR 50.73(d), this submittal provides additional information concerning the cause and corrective action for the referenced Licensee Event Report (LER) which addressed an occurrence involving a spurious actuation of the Fuel Handling Isolation System. Neither the health and safety of plant personnel or the public were affected by this occurrence.

If you require any additional information, please so advise.

Sincerely,

HEMorg

Enclosure: LER No. 88-011, Revision 1

cc: C. W. Caldwell (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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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)
FUEL HANDLING ISOLATION SYSTEM TRAIN "A" ACTUATION DUE TO FAILURE OF RADIATION MONITOR 2RT-7822 POWER SUPPLY

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 5	1 2	8 8	8 8	---	0 1 1	--- 0 1	1 0	3 0	8 9	NONE	0 5 0 0 0
											0 5 0 0 0

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

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
H. E. Morgan, Station Manager	AREA CODE 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
B	V G	I M O D	N 3 0 5	YES					

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 May 12, 1988, at 1100, with Unit 2 at 100% reactor power, the Train "A" Fuel Handling Isolation System was actuated by radiation monitor gas channel 2RI-7822B1. After the airborne activity levels in the FHB were determined to be normal, FHIS Train "A" was secured. The monitor was placed in bypass and the FHB ventilation system was returned to normal.

All FHIS Train "A" components functioned as designed. The redundant FHIS Train "B" remained operable throughout the event.

The actuation was due to loss of power in the radiation monitor module resulting from a failure of a -15 VDC power supply (components affected included a capacitor, diodes and a voltage regulator). A replacement module was verified to conform to the current design and was installed in place of the failed module. In addition, the 2RI-7822B1 module interfacing circuits/components were tested and determined to be operating satisfactorily.

Failure analysis has determined that the cause of the -15 VDC power supply failure was a burr on a metal flat plate heat sink which resulted in a short circuit from the -15 VDC voltage regulator to the heat sink on which the regulator was mounted; the short circuit caused the failure of two diodes in the -33 VDC supply to the voltage regulator. SCE will: 1) Inspect all similar ESF radiation monitor modules for heat sink burrs prior to installation of new modules, and 2) Review the vendor's quality program to determine if enhancements by the vendor are necessary to preclude recurrence.

Plant: San Onofre Nuclear Generating Station (SONGS)
Unit: 2
Reactor Vendor: Combustion Engineering
Event Date: May 12, 1988
Time: 1100

A. CONDITIONS AT TIME OF THE EVENT:

Mode: 1, Power Operations at 100% reactor power

B. BACKGROUND INFORMATION:

The Fuel Handling Isolation System (FHIS) (EIIS System Code VG) consists of two independent "trains" of radiation monitors (2RT-7822 for Train "A" and 2RT-7823 for Train "B") (EIIS Component Code RIT), associated dampers and recirculation air filtration units. Each train consists of a particulate/iodine channel (2RI-7822A1 and 2RI-7823A2, Train "A" and "B", respectively) and a gas channel (2RI-7822B1 and 2RI-7823B2, Train "A" and "B", respectively). Only one channel is required to initiate an actuation. Each train is actuated by either a remote manual push button or by one of the radiation monitors sensing high radiation, instrument failure, or loss of power.

C. DESCRIPTION OF THE EVENT:

1. Event:

On May 12, 1988, at 1100, with Unit 2 at 100% reactor power, the Train "A" Fuel Handling Isolation System (FHIS) was actuated by radiation monitor gas channel 2RI-7822B1. There was no indication of increased radiation levels in the Fuel Handling Building (FHB). After the airborne activity levels in the FHB were confirmed to be normal, FHIS Train "A" was secured. The monitor was placed in bypass and the FHB ventilation system was returned to normal.

All FHIS Train "A" components functioned as designed. The redundant FHIS Train "B" remained operable throughout the event.

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

None.

3. Sequence of Events:

TIME	ACTION
1100	FHIS Train "A" actuated.
1245	FHIS Train "A" was secured and RI-7822B1 was placed in bypass. FHB ventilation returned to normal.

4. Method of Discovery:

Control Room indications and alarms alerted the operators to the FHIS actuation.

5. Personnel Actions and Analysis of Actions:

The operators responded properly to the FHIS actuation by verifying proper system operation and ensuring FHB airborne activity levels were below the actuation set point prior to securing the FHIS.

6. Safety System Responses:

All FHIS Train "A" components functioned as designed.

D. CAUSE OF THE EVENT:

1. Immediate Cause:

Loss of power in the radiation monitor module (EIIS Component Code IMOD) was due to failure of a -15 VDC power supply.

2. Root Cause:

The radiation monitor module (including the failed power supply components) was sent to an off-site engineering laboratory for failure analysis. Results of the analysis determined the root cause of the failure to be a burr on a metal flat plate heat sink which established a short circuit from the plate to a -15 VDC power supply voltage regulator which was mounted on the plate. The short circuit caused two rectifier diodes in the -33 VDC supply to the voltage regulator to overheat and fail.

The root cause of the FHIS actuation was equipment failure due to manufacturing deficiencies with Nuclear Measurement Corporation (NMC) CRM 74/75 instrument modules.

E. CORRECTIVE ACTIONS:

1. Corrective Actions Taken:

a. Circuits and components which interface with the module were tested and determined to be operating satisfactorily.

b. A replacement module was installed in 2RI-7822B which was determined to conform to the current design.

2. Planned Corrective Actions:

a. During installation of enhanced printed circuit cards in all inservice and spare ESF-related modules, the modules will be inspected for burrs in the heat sink plate. Any burrs will be removed. It is anticipated that the inspection of all such modules at SONGS will be completed by mid-1990.

b. SCE will review the vendor's quality program to determine if enhancements by the vendor are necessary to preclude recurrence of similar defects in future replacement modules.

F. SAFETY SIGNIFICANCE OF THE EVENT:

There is no safety significance to this event since all FHIS Train "A" components operated in accordance with design. In addition, the redundant FHIS Train "B" remained operable.

G. ADDITIONAL INFORMATION:

1. Component Failure Information:

The radiation monitor module is a CRM-74/75 instrument module manufactured by Nuclear Measurements Corporation (NMC). The two failed diodes (silicon, 1N2070, 0.75 Amp) were manufactured by International Rectifier.

2. Previous LERs on Similar Events:

None.

3. Results of NPRDS Search:

An NPRDS search revealed no information associated with -15 VDC power supply failures.