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FACIL:50-361 San Onofre Nuclear Station, Unit 2, Southern Californ 05000361
AUTH.NAME AUTHOR AFFILIATION
NIRDISD Southern California Edison Co.
MORGAN,H.E. Southern California Edison Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 88-016-00:on 880629,spurious actuation of containment purge isolation sys Train B occurred.

W/8 ltr.

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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 5

Title (4)

CONTAINMENT PURGE ISOLATION SYSTEM SPURIOUS ACTUATION DUE TO SIGNAL COUPLING

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 6	2 9	8 8	8 8	0 1 6	0 0	0 7	2 9	8 8	NONE	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)			
1	1 0 0	___ 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

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)

At 0754 on June 29, 1988, with Unit 2 at 100% power, while performing troubleshooting activities on the Fuel Handling Isolation System (FHIS) Train B radiation monitor, a spurious actuation of Containment Purge Isolation System (CPIS) Train B occurred. Containment purge was not in operation at the time of the actuation; thus, no actuation of components occurred. There is no safety significance to this event since radiation levels remained normal.

FHIS and CPIS wires are routed in common wire bundles. Due to the close proximity of the wiring, an actuation signal can be induced in the CPIS circuitry as a result of a sharp voltage transient in the FHIS wiring. Since the aforementioned troubleshooting results in such voltage transients, the cause of the CPIS actuation has been attributed to an induced voltage signal. The evaluation of CPIS/FHIS signal coupling is continuing. If this evaluation reveals other significant information related to the cause of this event, the LER will be revised.

The CPIS train B radiation monitor was bypassed to prevent further spurious actuations. The cabinet housing the CPIS and FHIS will be modified to separate the wiring currently routed in common wire bundles. Until this action is implemented, the appropriate train of CPIS or FHIS will be bypassed or manually actuated during testing or troubleshooting in order to minimize the potential of unplanned CPIS or FHIS actuations due to signal coupling.

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Plant: San Onofre Nuclear Generating Station
Unit: Two
Reactor Vendor: Combustion Engineering
Event Date: June 29, 1988
Time: 0754

A. CONDITIONS AT TIME OF THE EVENT:

Mode: 1, Power Operation

B. BACKGROUND INFORMATION:

The Containment Purge System (EIIS System Code VA) consists of two trains of supply and exhaust fan units (EIIS Component Code FAN) and valved pathways to supply filtered air to the Containment building and/or exhaust Containment atmosphere to the Containment Purge Stack. A Containment Purge Isolation System (CPIS) actuation stops the fan units and closes the purge valves (EIIS Component Code ISV) for the associated train. The CPIS can be actuated by a remote manual pushbutton or by either high radiation or instrument failure sensed by the associated area radiation monitors (RT-7856 and RT-7857) or process radiation monitors (RT-7804 and RT-7807) (EIIS Component Code RIT).

RT-7804 (Train A) and RT-7807 (Train B) are housed in the same cabinet as the Fuel Handling Isolation System (FHIS) (EIIS System Code VG) radiation monitors RT-7822 (Train A) and RT-7823 (Train B), respectively. Placing a monitor in bypass effectively removes the actuation function of the monitor.

C. DESCRIPTION OF THE EVENT:

1. Event:

At 0754 on June 29, 1988, while performing troubleshooting activities on the FHIS Train B radiation monitor, a spurious actuation of CPIS Train B occurred. Containment purge was not in operation at the time of the actuation; thus, no actuation of components occurred. There was no indication of increased levels on the radiation monitors. To prevent further spurious actuations, the monitor was placed in bypass.

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

None.

3. Sequence of Events:

TIME	ACTION
0754	CPIS Train B spuriously actuated.
0759	RT-7807 declared inoperable and placed in bypass.

4. Method of Discovery:

   Control room indications and alarms alerted the operators of the CPIS actuation.

5. Personnel Actions and Analysis of Actions:

   The operators responded properly to the CPIS actuation by verifying containment radiation levels were normal before placing the CPIS monitor in bypass.

6. Safety System Responses:

   Since containment purge was not in operation at the time of the CPIS actuation, no actuation of components occurred.

D. CAUSE OF THE EVENT:

1. Immediate Cause:

   In the course of troubleshooting FHIS Train B radiation monitor RT-7823, a sharp voltage transient was caused in its circuitry, most likely causing the CPIS actuation relay to deenergize via signal coupling.

2. Root Cause:

   a. FHIS and CPIS wires are routed in common wire bundles. The close proximity of this wiring allows signal coupling to occur.

   b. The evaluation of CPIS/FHIS signal coupling is continuing. If this evaluation reveals other significant information related to the cause of this event, the LER will be revised.

E. CORRECTIVE ACTIONS:

1. Corrective Actions Taken:

   The CPIS Train B radiation monitor was bypassed to prevent further spurious actuations. This implemented corrective action identified in earlier LERs (refer to section G2).

2. Planned Corrective Actions:

   a. The cabinet housing the CPIS and FHIS will be modified to separate the wiring currently routed in common wire bundles.

   b. Until action 2a above is completed, the appropriate train of CPIS or FHIS will be bypassed or manually actuated during testing or troubleshooting in order to minimize the potential of unplanned CPIS or FHIS actuations due to signal coupling.

c. This event will be reviewed with appropriate radiation monitoring and operations personnel.

F. SAFETY SIGNIFICANCE OF THE EVENT:

There is no safety significance to this event since there was no increase in radiation levels. The containment purge isolation valves were closed (their safety position) at the time of the actuation.

G. ADDITIONAL INFORMATION:

1. Component Failure Information:

Not Applicable.

2. Previous LERs on Similar Events:

a. LER 87-003 (Docket No. 50-361)

On 3/10/87, a spurious actuation of Unit 2 FHIS Train B occurred when the CPIS Train B reset button was depressed, resetting the CPIS relays and inducing a FHIS actuation signal. FHIS and CPIS relay coil wires were found to be routed in common wire bundles, allowing signal coupling to occur. The wiring for one CPIS relay was rerouted so that it is no longer adjacent to the FHIS relay wiring.

b. LER 87-010 (Docket No. 50-362)

On 5/23/87, a spurious actuation of Unit 3 FHIS Train B occurred. Deenergization of a CPIS Train B alarm relay during implementation of a design change is believed to have induced an actuation signal in the FHIS Train B circuitry. Previous corrective action was not sufficient to prevent recurrence, and further evaluation of the CPIS/FHIS circuitry interaction was undertaken. As an interim corrective action, the FHIS Train B radiation monitor was placed in Alarm Defeat (effectively removing the monitor from service) during subsequent CPIS Train B design change work.

c. LER 87-021 (Docket No. 50-361)

On 10/26/87, a spurious actuation of Unit 2 FHIS Train B occurred. Deenergization of a CPIS Train B alarm relay during implementation of a design change is believed to have induced an actuation signal in the FHIS Train B circuitry. The root cause investigation revealed that signal coupling can occur downstream of the Alarm Defeat switch, and that more separation of wiring would be required to prevent recurrence. The corrective action of separating the CPIS and FHIS wiring currently routed in common wire bundles has not yet been completed.

d. LER 87-029 (Docket No. 50-361)

On 12/12/87, a spurious FHIS Train B actuation occurred when the CPIS Train B monitor was actuated as part of the monthly channel functional surveillance test. A design change was implemented in late 1987 which installed "bypass" switches. These switches allow the actuation function of the FHIS and CPIS radiation monitors to be defeated. The evaluation of the FHIS/CPIS signal coupling, including application of these switches, was ongoing when this actuation occurred. Interim corrective action resulting from this event was to "bypass FHIS or CPIS, when appropriate, during CPIS or FHIS testing or other activity having a potential to cause a spurious actuation." The 6/29/88 actuation was not prevented since RT-7823 was expected to remain out of service for an extended period of time, and it was not considered "appropriate" to bypass RT-7807 for that extended length of time.

3. Results of NPRDS Search:

Not Applicable

Southern California Edison Company

SAN ONOFRE NUCLEAR GENERATING STATION

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SAN CLEMENTE, CALIFORNIA 92672

H. E. MORGAN
STATION MANAGER

TELEPHONE
(714) 368-6241

July 29, 1988

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

Subject: Docket No. 50-361
30-Day Report
Licensee Event Report No. 88-016
San Onofre Nuclear Generating Station, Unit 2

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 Containment Purge Isolation System. This event had no effect on the health and safety of either plant personnel or the public.

If you require any additional information, please so advise.

Sincerely,

HEMorgan

Enclosure: LER No. 88-016

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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