

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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

SUBJECT: LER 87-015-00: on 870905, spurious actuations of Train A  
 containment purge isolation sys initiated by containment  
 airborne radiation monitor 2RT-7856. Caused by grounding  
 nonconformances. Monitor modified. W/871005 ltr.

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 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: ELD Chandler 1cy.

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	PD5 LA	1 1	PD5 PD	1 1
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INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	AEOD/DOA	1 1	AEOD/DSP/NAS	1 1
	AEOD/DSP/ROAB	2 2	AEOD/DSP/TPAB	1 1
	DEDRO	1 1	NRR/DEST/ADS	1 0
	NRR/DEST/CEB	1 1	NRR/DEST/ELB	1 1
	NRR/DEST/ICSB	1 1	NRR/DEST/MEB	1 1
	NRR/DEST/MTB	1 1	NRR/DEST/PSB	1 1
	NRR/DEST/RSB	1 1	NRR/DEST/SGB	1 1
	NRR/DLPQ/HFB	1 1	NRR/DLPQ/QAB	1 1
	NRR/DOEA/EAB	1 1	NRR/DREP/RAB	1 1
	NRR/DREP/RPB	2 2	NRR/DRIS/SIB	1 1
	NRR/PMAS/ILRB	1 1	REG FILE 02	1 1
	RES DEPY GI	1 1	RES-TELFORD, J	1 1
	RES/DE/EIB	1 1	RGN5 FILE 01	1 1
EXTERNAL:	EG&G GROH, M	5 5	H ST LOBBY WARD	1 1
	LPDR	1 1	NRC PDR	1 1
	NSIC HARRIS, J	1 1	NSIC MAYS, G	1 1

NOTES: 1 1

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)  
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2DOCKET NUMBER (2)  
0 5 0 0 0 3 6 1 1 OF 0 6TITLE (4)  
CONTAINMENT PURGE ISOLATION SYSTEM (CPIS) SPURIOUS ACTUATIONSEVENT DATE (5)  
MONTH DAY YEAR  
0 9 0 5 8 7  
LER NUMBER (6)  
YEAR SEQ. NUMBER REV. NUMBER  
8 7 - 0 1 5 - 0 0  
REPORT DATE (7)  
MONTH DAY YEAR  
1 0 0 5 8 7  
OTHER FACILITIES INVOLVED (8)  
FACILITY NAMES  
DOCKET NUMBER (5)  
0 5 0 0 0 0 0 0 0 0 0 0OPERATING MODE (9)  
5  
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (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, NRC Form 366A)  
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  
H. E. MORGAN, STATION MANAGER  
TELEPHONE NUMBER  
AREA CODE  
7 1 4 3 6 8 - 6 2 4 1COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)  
CAUSE SYSTEM COMPONENT MANUFACTURER REPORTABLE TO NPRDS  
CAUSE SYSTEM COMPONENT MANUFACTURER REPORTABLE TO NPRDSSUPPLEMENTAL REPORT EXPECTED (14)  
YES (If yes, complete EXPECTED SUBMISSION DATE) X NO  
EXPECTED SUBMISSION DATE (15)  
MONTH DAY YEAR

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

Between 9/5/87 and 9/21/87, with Unit 2 shutdown for refueling, spurious actuations of the San Onofre Unit 2 Train "A" Containment Purge Isolation System (CPIS) were initiated by containment airborne radiation monitor 2RT-7856 on 20 occasions. The spurious actuations reported here, and in previous LERs, are most frequently caused by operation of Train "A" High Pressure Safety Injection (HPSI) system components.

Containment purge isolation valves were in the open position for 19 of the 20 actuations, and in each instance they closed in accordance with design requirements. In all cases, containment radiation levels were below the CPIS actuation set point.

Investigation into the cause of the frequent 2RT-7856 initiated CPIS actuations has identified a number of grounding non-conformances which increase the sensitivity of 2RT-7856 to electronic noise. Corrective actions implemented include modifying 2RT-7856 to conform with the design requirements and installation of a time delay in the monitor logic circuit. Monitor 2RT-7856 will be tested to assure substantially reduced sensitivity to noise prior to being returned to service.

The health and safety of the public and plant personnel were not effected by these occurrences as CPIS and monitor 2RT-7856 remained operable at all times.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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A. CONDITIONS AT TIME OF THE EVENT:

Plant: San Onofre Nuclear Generating Station      Unit: Two

Event Date: Various      Time: Various      Mode: 1 (Power Operation)  
                     See Table                      See Table

B. BACKGROUND INFORMATION:

1. Containment Purge Isolation System (EIIS System Code VA)

There are two independent Containment Purge Isolation System (CPIS) trains. Each train is comprised of a containment airborne radiation monitor (EIIS Component Code RIT), an area radiation monitor and a set of containment purge valves. Each train is actuated by: (a) a remote manual push button; (b) either of the monitors on high radiation; (c) instrument failure; or (d) loss of power.

2. Outage scheduling

Outage planning for the current Unit 2 refueling outage included provisions to modify Train "A" CPIS Monitor 2RT-7856 to correct the spurious actuations of this monitor. This planned corrective action had been indicated in prior LERs. For scheduling reasons, Train "B" ESF equipment, including the redundant Train "B" CPIS Monitor 2RT-7857, was removed from service first, thereby placing reliance on Train "A" ESF equipment, prior to implementation of the planned corrective action associated with the Train "A" monitor.

3. Set Point Reduction

Technical Specification Table 3.3-4, item 12.c, requires a reduction in the CPIS monitor trip set point while in Mode 6 (refueling), reducing it from the Modes 1 through 4 value of  $\leq 325$  mR/hr to the Mode 6 value of  $\leq 2.4$  mR/hr. This action concurrently increases the monitor's sensitivity to electronic "noise".

C. DESCRIPTION OF THE EVENT:

1. Event:

Between 9/5/87 and 9/21/87, with Unit 2 in the Modes identified below, 20 spurious actuations of the San Onofre Unit 2 Train "A" Containment Purge Isolation System (CPIS) occurred.

These actuations occurred in conjunction with operation of ESF Train "A" pumps, valves and electrical equipment during testing or as a result of welding operations.

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The containment purge isolation valves closed in all 19 instances in which they had been open in accordance with design. In one instance the purge isolation valves were already closed.

Table of Occurrences

<u>Date</u>	<u>Time</u>	<u>Mode</u>	<u>Immediate Cause/Remarks</u>
9-5-87	0921	5	Unknown noise spike.
9-6-87	2045	5	Operation of High Pressure Safety Injection (HPSI) Valve 2HV-9334.
NOTE: On 9/8/87 the CPIS monitor trip set point was reduced from $\leq 325$ mR/hr to $\leq 2.4$ mR/hr as required for Mode 6 operation.			
9-9-87	1635	6	HPSI pump 17 started. Core Alterations not in progress. All purge isolation valves closed at time of actuation.
9-10-87	0355	6	Saltwater Cooling Pump 307 started. Core Alterations not in progress.
9-11-87	0733	6	Welding in cable spreading room. Core Alterations not in progress.
9-11-87	1010	6	Welding in cable spreading room. Core Alterations not in progress.
9-11-87	1052	6	Welding in cable spreading room. Core Alterations not in progress.
9-11-87	1411	6	Welding in cable spreading room. Core Alterations not in progress.
9-11-87	1428	6	Welding in cable spreading room. Core Alterations not in progress.
9-13-87	0310	6	HPSI Pump 17 started. Core Alterations not in progress.
9-14-87	0845	6	HPSI pump 17 started. Core Alterations not in progress.
9-14-87	2125	6	Operation of Component Cooling Water valves 2HV-6370 and 2HV-6371. Core Alterations in progress.
9-15-87	1240	6	HPSI valve 2HV-9333 operated. Core Alterations in progress.
9-16-87	0230	6	Testing of HPSI components. Core Alterations in progress.

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<u>Date</u>	<u>Time</u>	<u>Mode</u>	<u>Immediate Cause/Remarks</u>
9-16-87	2038	6	Testing of HPSI Valve 2HV-9333. Core Alterations in progress.
9-17-87	2047	6	Functional testing of Containment Spray Pump Breaker P-012. Breaker in Test Position. Core Alterations not in progress.
9-18-87	1820	6	Functional testing of HPSI header valves. Core Alterations in progress.
9-20-87	0457	De-fueled	MOVATS Testing 2HV-0516 (Isolation Valve RCDT* to WGSS**).
9-20-87	1450	De-fueled	HPSI Valve 2HV-9330 operation.
9-21-87	1542	De-fueled	MOVATS Testing 2HV-0516 (Isolation Valve RCDT to WGSS).

\* Reactor Coolant Drain Tank  
 \*\* Waste Gas Sampling System

2. Inoperable Structures, Systems or Components that Contributed to the Event:  
None.
3. Method of Discovery: Control room annunciator alarms.
4. Personnel Actions and Analysis of Actions:

For each of the 20 occurrences, the recorded spike value for CPIS monitor 2RT-7856 was determined to be of very brief duration; and containment radiation levels were confirmed to have remained below the CPIS actuation set point.

For those occurrences in which the main purge valves were open, the valves were checked to verify their closure in accordance with the design. Following completion of these actions, CPIS monitor 2RT-7856 was reset and containment purge was re-established as necessary.

5. Safety System Responses:

CPIS monitor 2RT-7856, associated actuation circuitry and purge isolation valves operated as designed.

## D. CAUSE OF THE EVENT:

1. Immediate Cause:

Electrical noise, which increases during an outage, combined with increased sensitivity of the monitor due to the set point change.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

SAN ONOFRE NUCLEAR GENERATION STATION  
UNIT 2

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2. Intermediate Cause:

- a. It has been determined that the detector's internal circuitry ground connections do not conform with the vendor's design drawings in all respects. In one instance, the design resulted in an improper ground. This discrepancy increases the sensitivity of the detector to electronic noise.
- b. The monitor's design did not include provisions for filtering of short duration electronic noise experienced at Unit 2.

3. Root Cause:

- a. The vendor's configuration control process did not ensure replacement detectors conformed to the vendor's design disclosure documents.
- b. The vendor's design control process permitted a weakness in the design of the monitor.

E. CORRECTIVE ACTION:

1. Corrective Action Taken:

- a. Improper grounds between the detector circuitry and frame have been corrected.
- b. A review of recorded noise spikes on monitor power supply circuitry has determined that the normal time duration of the majority of noise spikes is less than 20 msec. An RC filter circuit that results in an approximate 400 msec. time delay, has been incorporated in the monitor actuation circuitry, by implementation of a design change. This design change has been implemented on the Unit 2 monitors and will be implemented on the Unit 3 monitors during the next refueling outage. This filter is expected to eliminate those spurious actuations occurring as a result of starting Train "A" ESF equipment.

2. Planned Corrective Action:

- a. Examination of similar detector assemblies located on site has been initiated to determine their conformance with the detector design requirements.
- b. Following completion of the above corrective actions, the system will be tested to determine the effectiveness of the change. In the event testing indicates these corrective actions are not effective, additional instrumented testing of the system will be performed in order to identify other possible causes of the spurious actuations and further corrective action. If this becomes necessary a revision to this LER will be provided.

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- c. SCE Quality Assurance will perform a review of the procurement of this detector and evaluate the configuration control, manufacturing process and quality control programs of the vendor via the normal SCE Non-Conformance Report process.

F. SAFETY SIGNIFICANCE OF THE EVENT:

The health and safety of the public and plant personnel were not effected by these occurrences as CPIS and monitor 2RT-7856 remained operable at all times.

G. ADDITIONAL INFORMATION:

1. Component Failure Information: Not Applicable.
2. Previous LERs on Similar Events:

Similar CPIS actuations involving CPIS monitor 2RT-7856 were most recently reported in LER 87-011 (Docket 50-361).

3. Other Information:

The detector assembly involved is a model GA-3, manufactured by Nuclear Measurements Corporation.

*Southern California Edison Company*

SAN ONOFRE NUCLEAR GENERATING STATION

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October 5, 1987

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

Subject: Docket No. 50-361  
30-Day Report  
Licensee Event Report No. 87-015  
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 twenty occurrences involving spurious actuations of the Containment Purge Isolation System. Neither the health and safety of plant personnel nor the health and safety of the public was affected by these occurrences.

If you require any additional information, please so advise.

Sincerely,

*HEMog* —

Enclosure: LER No. 87-015

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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