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

SUBJECT: LER 88-013-01: on 880606, fuel handling isolation sys train
 B spurious actuation during monitor return to svc.

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Southern California Edison Company

SAN ONOFRE NUCLEAR GENERATING STATION

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H. E. MORGAN
STATION MANAGER

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June 14, 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. 88-013, Rev. 1
San Onofre Nuclear Generating Station, Unit 2

Pursuant to 10 CFR 50.73(d), this submittal provides the revised 30-day written Licensee Event Report (LER) for an occurrence involving a spurious actuation of the Fuel Handling Isolation System. Neither the health and safety of plant personnel or the public was affected by this occurrence.

If you require any additional information, please so advise.

Sincerely,

H. E. Morgan

Enclosure: LER No. 88-013-01

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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LICENSEE EVENT REPORT (LER)

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

FUEL HANDLING ISOLATION SYSTEM TRAIN "B" SPURIOUS ACTUATION DURING MONITOR RETURN TO SERVICE

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	0 6	8 8	8 8	---	---	0 6	1 4	8 9	NONE	0 5 0 0 0											
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)																		
POWER LEVEL (10)			20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)	20.405(a)(1)(iv)	20.405(a)(1)(v)	20.405(c)	50.36(c)(1)	50.36(c)(2)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vii)	50.73(a)(2)(viii)(A)	50.73(a)(2)(viii)(B)	50.73(a)(2)(x)	73.71(b)	73.71(c)	Other (Specify in Abstract below and in text)	
1 0 0												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 | 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):
 Yes (If yes, complete EXPECTED SUBMISSION DATE) NO
 Month: Day: Year:

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

On 6/6/88, at 0020, with Unit 2 at 100% reactor power, Fuel Handling Isolation System (FHIS) Train "B" was spuriously actuated when the particulate/iodine channel of radiation monitor 2RI-7823A2 received an instrument failure signal during restoration testing for return to service. 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 "B" was secured and the FHB ventilation system was returned to normal.

Investigations of other spurious FHIS actuations during the return to service of similar monitors (previously reported in LER 88-012, Docket No. 50-362) identified that the Train "B" actuation was most likely triggered by the resetting of the monitor. Switching the normal/bypass switch causes the reset/test lamp to extinguish and the lamp power transformer to dissipate stored magnetic energy by discharging high-voltage into the FHIS circuitry. The high-voltage spike causes the actuation relay to trigger.

Surge suppression devices have been installed on 2RI-7823A2 and all Units 2 and 3 Engineered Safety Feature process radiation monitors. It is believed that these devices will preclude spurious actuations due to high-voltage surges when the reset/test lamp is extinguished.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

SAN ONOFRE NUCLEAR GENERATION STATION UNIT 2	DOCKET NUMBER 05000361	LER NUMBER 88-013-01	PAGE 2 OF 5
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Plant: San Onofre Nuclear Generating Station
Unit: Two
Reactor Vendor: Combustion Engineering
Event Date: 06-06-88
Time: 0020

A. CONDITIONS AT TIME OF THE EVENT:

Mode: 1, Power Operations at 100%

B. BACKGROUND INFORMATION:

The Fuel Handling Isolation System (FHIS) [VG] consists of two independent "trains" of radiation monitors (2RT-7822 for Train "A" and 2RT-7823 for Train "B") [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. A FHIS-actuation isolates normal ventilation to the Fuel Handling Building (FHB) and initiates recirculation.

FHIS train actuation circuits are removed from service, tested and returned to service by: 1) turning the normal/bypass switch [HS] from "normal" to "bypass", which extinguishes a reset/test lamp [IL]; 2) depressing the reset/test push-button, which illuminates the reset/test lamp; 3) releasing the reset/test push-button, which extinguishes the reset/test lamp; and 4) turning the normal/bypass switch to "normal", which illuminates the reset/test lamp. Observation of the reset/test lamp during this process ensures that the train actuation relays are not in the actuated state and are capable of actuation by a channel actuation relay.

C. DESCRIPTION OF THE EVENT:

1. Event:

On 6/6/88, at 0020, with Unit 2 at 100% reactor power, FHIS Train "B" was spuriously actuated when the particulate/iodine channel of radiation monitor 2RI-7823A2 received an instrument failure signal during restoration testing for return to service. 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 "B" was secured and the FHB ventilation system was returned to normal.

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

None.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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3. Sequence of Events:

<u>DATE</u>	<u>TIME</u>	<u>ACTION</u>
06/06/88	0020	FHIS Train "B" actuated.
06/06/88	0035	FHIS Train "B" reset/secured. FHB ventilation returned to normal.

4. Method of Discovery:

Control Room indications and alarms alerted the operators to the FHIS actuation. In addition, it was observed that the Train "B" cooler fan (2ME-442) [FAN] had not started, and the FHIS control room actuation alarm (CR60A22) [ALM] had not annunciated.

5. Personnel Actions and Analysis of Actions:

Operators responded properly to the FHIS actuation by verifying system operation and ensuring FHB airborne activity levels were below the actuation setpoint prior to resetting FHIS. When it was observed that cooler fan 2ME-442 did not automatically start upon the FHIS actuation, operators responded properly by manually starting the cooler fan via the remote handswitch.

6. Safety System Responses:

As described in section D, "CAUSE OF THE EVENT", the FHIS actuation was spuriously initiated by a voltage surge which briefly induced a current in the FHIS circuits. The following FHIS responses were observed; however, these responses are in accordance with FHIS design.

- a. Cooler fan 2ME-442 did not actuate because the brief signal generated in the FHIS circuitry, while of a duration sufficient to actuate the dampers, and chilled water pump, was not sufficient to overcome the cooler fan start control scheme time delay characteristics.
- b. The FHIS control room actuation alarm CR60A22, which is initiated from the channel actuation relays up-stream of the train actuation relay, did not annunciate. The channel circuitry contains a power supply module which effectively filters current surges induced by high-voltage spikes.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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D. CAUSE OF THE EVENT:

1. Immediate Cause:

Investigations of previous spurious FHIS actuations have revealed that the Train "B" actuation relay was most likely triggered by resetting radiation monitor 2RI-7823A2. Resetting 2RI-7823A2 causes the reset/test lamp to be extinguished and the lamp power supply transformer [XFMR] (which converts 120 volt AC power to 6.3 volts AC) to dissipate stored magnetic energy by discharging high-voltage into the FHIS Train "B" circuitry. Investigation into the actuation identified that the instrument failure signal was generated sometime during the sequence of switching the "normal/bypass" switch from the "normal" to the "bypass" position and depressing the reset push-button. Following the actuation, instrument failure signals were sporadically produced while duplicating this evolution.

2. Root Cause:

The FHIS train actuation circuitry and cabling was unable to dissipate the high voltage surge. The surge has been measured to be as high as 800 volts during previous testing. Since the circuit had inadequate surge suppressing capabilities, the actuation relay initiated when the reset/test push-button was depressed.

E. CORRECTIVE ACTIONS:

Surge suppression devices have been installed in 2RI-7823A2 and all Units 2 and 3 Engineered Safety Feature process radiation monitors.

F. SAFETY SIGNIFICANCE OF THE EVENT:

There is no safety significance to this event since FHB airborne activity levels remained normal and the monitor actuated spuriously. In addition, there is no safety significance associated with FHIS alarm window CR60A22 failure to annunciate since FHIS alarm window CR60Z06 annunciated to alert the operators. Also, although 2ME-442 did not start automatically with the actuation signal (for the reason described above), it was manually started moments later by the operators.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

SAN ONOFRE NUCLEAR GENERATION STATION UNIT 2	DOCKET NUMBER 05000361	LER NUMBER 88-013-01	PAGE 5 OF 5
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G. ADDITIONAL INFORMATION:

1. Component Failure Information:

Not applicable.

2. Previous LERs on Similar Events:

a. LER 88-016 (Docket No. 50-361)

On 6/29/88, a spurious actuation of CPIS (Containment Purge Isolation System) Train "B" occurred during investigative testing of a FHIS Train "B" radiation monitor. The cause of the sharp voltage transient could not be determined, and further evaluation was continued. Subsequent to transmittal of this LER, the evaluation has revealed that the reset/test lamp transformer generates a large (greater than 800 volt) voltage spike when the lamp is extinguished.

b. LER 88-012 (Docket No. 50-362)

On 12/28/88, a spurious actuation of FHIS Train "A" occurred during testing of CPIS radiation monitor 3RT-7804. The CPIS monitor induced a signal in the FHIS circuitry when the CPIS reset/test lamp was extinguished.

3. Results of NPRDS Search:

Not applicable.