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LaSalle Generating Station
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ComEd

April 26, 1996

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Licensee Event Report #96-003-00, Docket #050-373 is being submitted to your office in accordance with 10CFR50.73 (a) (2) (iv).

Respectfully,

for D. J. Ray
Station Manager
LaSalle County Station

Enclosure

cc: H. J. Miller, NRC Region III Administrator
P. G. Brochman, NRC Senior Resident Inspector - LaSalle
C. H. Mathews, IDNS Resident Inspector - LaSalle
F. Niziolek, IDNS Senior Reactor Analyst
INPO - Records Center
D. L. Farrar, Nuclear Regulatory Services Manager

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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
LaSalle County Station Unit One	05000373	1 of 4

TITLE (4)
Unit One Reactor Scram due to Spurious Spike of H Intermediate Range Monitor

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL	REVISION	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									NONE	
03	27	96	96	003	00	04	26	96	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)					
		20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(iii)	73.71(b)
POWER LEVEL (10)	0	20.2203(a)(1)		20.2203(a)(3)(ii)	X	50.73(a)(2)(iv)	73.71(c)
		20.2203(a)(2)(i)		20.2203(a)(4)		50.73(a)(2)(v)	OTHER
		20.2203(a)(2)(ii)		50.36(c)(1)		50.73(a)(2)(vii)	(Specify in Abstract below and in Text, NRC Form 366A)
		20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(viii)(A)	
		20.2203(a)(2)(iv)		50.73(a)(2)(i)		50.73(a)(2)(viii)(B)	
		20.2203(a)(2)(v)		50.73(a)(2)(ii)		50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Eugene R. Pfister, Senior System Engineering	(815) 357-6761 x 2740

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).	X	NO				

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

At 1353 hours on March 27,1996, during the performance of LOS-RD-SR5, "Control Rod Drive Timing", a scram signal was received and caused the single control rod, 50-43, which was withdrawn to position 18, to fully insert. Preliminary investigation determined that the cause of the RPS actuation was a spurious spike of the H Intermediate Range Neutron Monitor (IRM) Channel. Since the RPS non-coincident scram shorting links were removed at the time as required for control rod movement in Mode 5, the single neutron monitor channel trip caused the full reactor scram. The IRM H spike which initiated this event was caused by coupling of electromagnetic noise into the channel. The coupling occurred at a connector located beneath the reactor vessel where the fixed signal cable joins with a removable 20 foot cable.

The scram was reset and H IRM was bypassed pending further investigation of the problem.

The root cause of this event was determined to be the degraded condition of the signal cable shield and connector.

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

A. PLANT CONDITIONS PRIOR TO EVENT

Unit(s): 1 Event Date: 03/27/96 Event Time: 1353 Hours

Reactor Mode(s): 5 Modes(s) Name: Refuel Power Level(s): 0%

B. DESCRIPTION OF EVENT

At 1353 hours on March 27,1996, during the performance of LOS-RD-SR5, "Control Rod Drive Timing", a scram signal was received and caused the single control rod, 50-43, which was withdrawn to position 18, to fully insert. Preliminary investigation determined that the cause of the RPS actuation was a spurious spike of the H Intermediate Range Neutron Monitor (IRM)[IG] channel. Since the RPS non-coincident scram shorting links were removed at the time as required for control rod movement in Mode 5, the single neutron monitor channel trip caused the full reactor scram.

No other IRM channel indication changes were noted during this event. A short period alarm occurred on the D Source Range Monitor (SRM)[IG] channel approximately 150 milliseconds after the IRM trip but the count rate change on the SRM was not sufficient to cause a high alarm (setpoint of 10000 counts/second). IRM H and SRM D are in the same RPS division.

The control rod being moved at the time of the scram was in the Northwest quadrant of the core. H IRM is located in the Southeast quadrant. The spike did not appear to be related to the control rod movement.

The scram was reset and H IRM was bypassed pending further investigation of the problem.

C. CAUSE OF EVENT

The H IRM spike which initiated this event was caused by coupling of electromagnetic noise into the channel. The coupling occurred at a connector located beneath the reactor vessel where the fixed signal cable joins with a removable 20 foot cable. The removable cable forms a loop required for detector motion. The noise coupling location was determined by inducing noise on the shield of the IRM signal cable and evaluating the amplitude of the noise coupled into the signal path. The test showed that the coupling amplitude was approximately 3 times greater than that of any of the other IRMs. It was also noted that the coupling amplitude could be affected by flexing the signal cable in the vicinity of the connector. Visual inspection of the connector did not reveal any damage and the degradation did not show up on current versus voltage or time domain reflectometer tests.

While the test results cannot determine the exact failure mechanism, it is believed that the connector was degraded either by excessive pull on the cable during under vessel maintenance work or by corrosion of the braid conductors. Both failure mechanisms have been observed during other instances of under vessel connector maintenance.

The source of the electromagnetic pulse which caused the spike cannot be determined. Other plants have identified certain equipment which, when started or stopped, cause IRM spikes. No such equipment has been identified at LaSalle. A review of the alarm and sequence of events logs did not reveal any other equipment actuations at the time of the event. Maintenance activities such as welding also generate electromagnetic fields. While there was welding taking place in the drywell on the day of the event, it is not possible to establish the exact times that arcs were being struck.

The root cause of this event was the degraded condition of the signal cable shield and connector.

D. ASSESSMENT OF SAFETY CONSEQUENCES

The safety design basis function of the IRM system is to generate a trip signal which can be used to prevent fuel damage resulting from abnormal operational transients while operating in the intermediate power range. While the degradation which occurred in IRM 1H made the channel more susceptible to noise, it did not affect the channel's ability to detect neutrons or generate the proper trip signals.

The scram which occurred as a result of the spurious trip signal was of minimal significance. The plant was in the refuel mode at the time with only one control rod withdrawn, no transient was caused by this event, and there was no potential for fuel clad damage or radiological release.

E. CORRECTIVE ACTIONS

The degraded connector was replaced. Testing was performed to verify that the noise coupling level had been reduced to a value typical of other IRM channels and that the coupling level remained unchanged even when the signal cable was flexed near the connector. Noise coupling tests were performed on all other IRM channels to verify that none had been degraded in the same manner as 1H IRM. All of these tests were negative.

A design change which will replace the existing double shielded signal cables between the IRM preamplifiers and detectors with triple shielded cables is scheduled to be installed during the next Unit 1 and Unit 2 refuel outages. Associated connectors will also be replaced. In addition, the design change will eliminate the connection which failed during this event by utilizing a continuous cable run from the containment penetration to the detector. Should it become necessary to replace the under vessel section of cable at a later date, a junction box is being installed on the outside of the reactor pedestal to house and protect the mating connector. While the connectors at the bottom of the detector are of the same type as the one which caused this event, they are protected, to some extent, by a cable guard. The cable guard is a piece of pipe which attaches to the detector drive tube on one end and has a cord grip on the other end. Thus, it provides protection from direct physical damage, impingement of water and relieves some of the strain on the connector arising from pull on the cable. To enhance the protection offered by the cable guard, the design change mentioned above will install O-rings and a drain hole

to prevent moisture intrusion and buildup inside the cable guard.

F. PREVIOUS OCCURRENCES

The following LaSalle events relate to noncoincident scrams caused by IRM spikes.

LER NUMBER	TITLE
LER 84-008-00	Non-Coincident Scramm on Unit 1/MMD Personnel bumped Cable
LER 84-009-00	Non-Coincident Scramm on Unit 1/MMD Personnel bumped Cable
LER 84-010-00	Non-Coincident Scramm on Unit 1/MMD Personnel bumped Cable

G. COMPONENT FAILURE DATA

Since no component failure occurred, this section is not applicable