



Commonwealth Edison
LaSalle County Nuclear Station
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January 11, 1995

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

Licensee Event Report #94-015-00, Docket #050-373 is being submitted to your office in accordance with 10CFR50.73(a)(2)(iv).

D. J. Ray
Station Manager
LaSalle County Station

DJR/JEB/lja

Enclosure

cc: NRC Region III Administrator
NRC Senior Resident Inspector
INPO - Records Center
IDNS Resident Inspector
IDNS Senior Reactor Analyst
Nuclear Licensing Administrator

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LICENSEE EVENT REPORT (LER)																		Form Rev 3.0						
Facility Name (1) LaSalle County Station Unit 1												Docket Number (2) 0 5 0 0 0 3 7 3 1 of 0 5												
Title (4) Unit 1 Primary Containment Isolation and Scram due to Switch Failure																								
Event Date (5)			LER Number (6)				Report Date (7)				Other Facilities Involved (8)													
Month	Day	Year	Year	///	Sequential	///	Revision	Month	Day	Year	Facility Names				Docket Number(s)									
1	2	1	2	9	4	9	4	---	0	1	5	---	0	0	0	1	1	1	9	5				
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(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									
			20.405(a)(1)(iii)			50.73(a)(2)(i)						50.73(a)(2)(viii)(A)			in Abstract									
			20.405(a)(1)(iv)			50.73(a)(2)(ii)						50.73(a)(2)(viii)(B)			below and in									
20.405(a)(1)(v)			50.73(a)(2)(iii)						50.73(a)(2)(x)			Text)												
<div style="background-color: #cccccc; height: 20px; width: 100%;"></div>																								
LICENSEE CONTACT FOR THIS LER (12)																								
Name Jeff Bryant, System Engineer, Extension 2955												TELEPHONE NUMBER												
												AREA CODE												
												8 1 5 3 5 7 - 6 7 6 1												
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																								
CAUSE	SYSTEM	COMPONENT	MANUFAC- TURER	REPORTABLE TO NPDs	CAUSE	SYSTEM	COMPONENT	MANUFAC- TURER	REPORTABLE TO NPDs															
X																								
SUPPLEMENTAL REPORT EXPECTED (14)										Expected Submission Date (15)		Month	Day	Year										
X YES (If yes, complete EXPECTED SUBMISSION DATE)										NO		0	9	1	5	9	5							
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)																								

On December 12, 1994, Unit 1 was in Operating Condition 1 (Run) at 92% power. At 2132 hours, a Group 1 Main Steam Isolation Valve (MSIV) Primary Containment Isolation (PCIS) occurred due to a spurious Main Steam Line (MSL) High Flow signal on one PCIS channel while a calibration was being performed on the other channel. The closure of the MSIVs caused the Reactor to scram. All control rods fully inserted. Three Safety Relief Valves (SRVs) lifted and reset at appropriate pressures. Two additional scram signals were generated due to reactor level perturbation caused by the manual operation of SRVs to control reactor pressure.

The cause of the scram was a Group 1 Isolation signal initiated by the spurious trip and reset of MSL High Flow switch 1E31-N009C. This occurred during the performance of Instrument Surveillances LIS-MS-102 and LIS-MS-302. Investigation determined the 1E31-N009C Static-O-Ring Switch had failed. This switch was replaced. The failed switch will be disassembled and inspected to determine the cause of failure.

This report is being submitted per 10CFR50.73(a)(2)(iv) due to an automatic actuation of the Reactor Protection System.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION															Form Rev 3.0							
FACILITY NAME (1)	DOCKET NUMBER (2)								LER NUMBER (6)													
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LaSalle County Station	0 5 0 0 0 3 7 3								9	4	-	0	1	5	-	0	0	0	2	OF	0	5
TEXT Energy Industry Identification System (EIIS) codes are identified in the text as [XX]																						

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

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

A. CONDITION PRIOR TO EVENT

Unit(s): 1 Event Date: 12/12/94 Event Time: 2132 Hours
 Reactor Mode(s): 1 Modes(s) Name: Run Power Level(s): 92%

B. DESCRIPTION OF EVENT

On December 12, 1994, the Instrument Maintenance Department (IMD) was performing Instrument Surveillances LIS-MS-102 and LIS-MS-302, "Unit 1 Main Steam Line (MSL) High Flow MSIV Isolation Calibration/Functional Test", when a Group 1 Main Steam Isolation Valve (MSIV, MS)[SE] Primary Containment Isolation (PCIS, PC)[NH] was received. The surveillances had been performed on three of the four instrument channels (A, B, and C) that input to the PCIS logic. During the surveillance prior to the scram, the 1E31-N009B switch was taken out of service because it did not pass the surveillance requirements. Only two switches per line are required to be operable. The IMD Technicians were starting the fourth channel (D) when the isolation occurred.

There are four instrument racks, and each instrument rack contains one PCIS sub-channel. Each PCIS sub-channel consists of four flow switches. These sub-channels are A1 (A switches), B1 (B switches), A2 (C switches), and B2 (D switches). The switches are configured in a one-out-of-two twice logic. This logic requires an A or C switch actuation and a B or D switch actuation in order to complete the isolation logic. To trip a PCIS sub-channel from the high flow switches, at least one switch in a channel must trip on high flow. To actually receive a Group 1 isolation, one of the A or C channels must trip along with one of the B or D channels. This is a one out of two taken twice logic arrangement. At the time of the surveillance, the IMD Technician had actuated the D channel logic with the 1E31-N008D flow switch and was in the process of returning the channel to normal. During this time, a spurious isolation signal was received from the C channel logic that resulted in a Group 1 isolation.

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

B. DESCRIPTION OF EVENT (Continued)

After the scram, the initial investigation into the cause of the spurious signal revealed that the 1E31-N009C switch was not showing repeatability. The switch was tested eight times and would not trip consistently within the required tolerances of the surveillance. The normal setpoint is 103 plus or minus 1 PSID. The switch was declared inoperable and taken out of service. At this point, both the 1E31-N009B switch (which had failed earlier in the testing sequence) and the 1E31-N009C switch were replaced with new switches that had been characterized. Characterization is the process in which each individual switch's acceptance is determined, based on static shift and repeatability, by the statistical analysis of switch calibration data. The characterization process is governed by LIP-GM-956, "Analysis of Static-O-Ring Differential Pressure Switch Data". The failed switches were brought back to the Instrument Maintenance shop for further diagnostic testing. A test rig was made utilizing a GE HFA relay and a power supply along with the Static-O-Ring (SOR) characterization rig. The SOR rig allowed the cycling of the flow switch at approximately 1000# static line pressure with the necessary differential pressure. The HFA relay and the power supply made it possible to simulate the electrical load the failed switches normally see in the plant.

Subsequent testing on the 1E31-N009C switch, which had been removed, demonstrated some unusual electrical characteristics. Both before and after the switch was cycled, the flow switch contacts developed an oscillating voltage drop. Although the voltage drops varied in amplitude and duration, it was evident that the possibility existed for the drop to be long enough and of a large enough amplitude to drop out the PCIS subchannel relay.

To determine if any other flow switches demonstrated this phenomenon, special test LST-94-092, "Unit 1 SOR Test" was written to monitor the contacts of the installed flow switches while the IMD performed functional tests. Chart recorders were connected across each flow switch contact at the instrument rack, and left running. The IMD performed the functional test and the results were reviewed. After this test, it was determined that the 1E31-N008D switch was suspect and warranted replacement. The switch has been replaced.

C. APPARENT CAUSE OF EVENT

The cause of the scram was a Group 1 Isolation signal initiated by the spurious trip and reset of the 1E31-N009C MSL high flow switch, during the performance of Surveillances LIS-MS-102 and LIS-MS-302.

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LaSalle County Station	0	5	0	0	3	7	3	9	4	-	0	1	5	-	0	0	0	4	OF	0	5
TEXT Energy Industry Identification System (EIIIS) codes are identified in the text as [XX]																					

D. SAFETY ANALYSIS OF EVENT

The safety consequences of the event were minimal. The Primary Containment Isolation System functioned as designed when a high flow isolation signal is received. The spurious trip of MSL High Flow Switch 1E31-N009C acted in the proper manner and, in conjunction with the IMD Surveillance, initiated the isolation. All isolation actions were initiated and completed as designed.

E. CORRECTIVE ACTIONS

1. Immediate Corrective Actions

- The immediate corrective actions were to recalibrate the "C" channel high flow switches.
- While performing calibration, switch 1E31-N009C was found non repeatable. The switch was taken out of service and replaced.

2. Actions to Prevent Recurrence

- A special test procedure, LST-94-092, was written and performed to verify that the remaining Main Steam Line High Flow Switches operated properly.
- All Main Steam Line High Flow Switches were functionally tested to demonstrate operability.
- The failed 1E31-N009C switch will be disassembled and inspected at the manufacturer to determine the cause of the failure. The results of this investigation will determine the scope of further corrective action to be taken. A supplement to this LER will be submitted upon completion of the failure analysis.

F. PREVIOUS EVENTS

LER Number	Title
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86-009-00	Main Steam High Flow Group I Isolation/Scram
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LaSalle County Station	0	5	0	0	0	3	7	3	9	4	-	0	1	5	-	0	0	0	5	OF	0	5
TEXT Energy Industry Identification System (EIIIS) codes are identified in the text as [XX]																						

G. COMPONENT FAILURE DATA

Manufacturer	Nomenclature	Model Number	MFG serial Number
SOR (Static "O" Ring)	Pressure Differential Switch	102AS-B403-NX-CIA-JJTTXG	86-10-558