NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
LaSalle County Station Unit 1	0 5 0 0 0 3 7 3	1 OF 0 5

TITLE (4)
Main Steam Line Flow DPIS

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 2	1 4	8 4	8 4	0 1 3	0 0		0 3	1 5	8 4		0 5 0 0 0
											0 5 0 0 0

OPERATING MODE (9): 4
POWER LEVEL (10): 0 0 0

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)	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)	X 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	TELEPHONE NUMBER
John B. Reis Jr., ext. 640	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	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
X	J M	P D I S	1 2 0 4	Y							

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)

Between 2300 on 2/14/84 and 0700 on 2/15/84 during the performance of LIS-MS-02, 9 out of 16 Main Steam High Flow Switches were found to be out of Spec High, with 3 of the instruments exceeding allowable limits. At the time the Unit was in cold shutdown, operating condition #4. All of the instruments were immediately (and satisfactorily) recalibrated in accordance with LIS-MS-02. Since the previous performance of the calibration portion of LIS-MS-02, the Unit #1 Rx has been in operating conditions #1, 2, 3, and 4. The increase in the follower drag at the lobe point of the can on the Barton 288A dP switch appears to be the cause of the drifting problem. If current trending indicates an inherent problem with the Barton 288A, consideration will be given to adjusting the setpoint to compensate for the instrument drift, to inspect, repair, or replace the cam roller mechanism for the switches, or to replace the existing Barton 288A Model.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

I. EVENT DESCRIPTION:

Between 2300 on 2/14/84 and 0700 on 2/15/84, LIS-MS-02 (Main Steam Line High Flow MSIV Isolation Calibration & Functional Test) was performed with the following comments:

9 of the 16 instruments were found out of spec high. Of these 9 instruments, 3 were found to exceed the LCO Allowable value of less than or equal to 116 PSID, the Trip setpoint is less than or equal to 111 PSID (Refer to Table 3.3.2-2 of Tech. Specs).

The LIS-MS-02 Tolerance is 111 minus 5 PSID.

The As Found switch values were as follows:

EPN	RECORDED TRIP VALUE	AS FOUND - SPEC	
2E31-N008A	111 PSID	0 PSID	*Out of Spec
2E31-N008B	116 PSID	+5 PSID *	
2E31-N008C	120 PSID	+9 PSID **	
2E31-N008D	113 PSID	+1 PSID *	**Out of tech spec allowable tolerance
2E31-N009A	107.5 PSID	-3.5 PSID	
2E31-N009B	115 PSID	+4.5 PSID *	
2E31-N009C	123 PSID	+12 PSID **	
2E31-N009D	110.5 PSID	-0.5 PSID	
2E31-N010A	111 PSID	0 PSID	
2E31-N010B	113.5 PSID	+2.5 PSID *	
2E31-N010C	114 PSID	+3 PSID *	
2E31-N010D	108 PSID	-3 PSID	
2E31-N011A	110.5 PSID	-0.5 PSID	
2E31-N011B	112 PSID	+1 PSID *	
2E31-N011C	121 PSID	+10 PSID **	
2E31-N011D	110 PSID	-1 PSID	

At the time of the discoveries, the Unit #1 Reactor was in cold shutdown, operating condition #4, a condition which the Unit had been in since 1800 on 2/14/84.

All instruments found out of spec were immediately (and satisfactorily) recalibrated, in accordance with LIS-MS-02, to the required setpoint.

The previous performance of the calibration portion of LIS-MS-02 was on 5/16/82.

During the period between 5/16/82 and 2/14/84, the Unit #1 Reactor has been occasionally in operation conditions #1, 2, and 3, along with #4.

There is no way of determining exactly when in the period between 5/16/82 through 2/14/84 that the instruments drifted out of their LCO limits.

II. CAUSE:

The flow measuring differential pressure switches are a Model 288A manufactured by ITT Barton. These instruments have a history of drifting.

(Refer to Section V; Previous Occurrences)

Upon review of the Present and Previous performances of LIS-MS-02, the Local Indicator Readings remained in spec; only the switches drifted.

The switch and indicator are 2 separate mechanical operations. Both driven off of the cam (attached to the Torque Shaft of the Differential Pressure Unit).

Since the Pointer indicator readings were in spec and since the indicator's differential drive arm is physically fixed (i.e. tack welded) to the cam, it is doubtful that there is any slippage about the DPU torque shaft.

The switch setting linkage would have to be extremely loose for any cam follower drag to pull the switch out of position (via the actuator arm). Therefore, drifting due to loose switch setting linkage appears to be improbable.

The 288A Barton is a very mechanical operating piece of equipment requiring a large number of inter-related part movements to transmit differential pressure values into precise local readings and switch actuations. With increasing mechanical complexity the potential for slop increases (i.e. the accuracy and repeatability decrease).

The more the switching action is performed, the greater the potential for net deviation from the setpoint.

Since the functional test is performed monthly and the calibration is performed every 18 months, the respective switches are cycled approximately 18 times (at least) between calibrations.

III. PROBABLE CONSEQUENCES OF THE OCCURRENCE:

The Main Steam Line High Flow MSIV Isolation System operates in the following manner:

1E31-N008A,B,C, & D are Redundant Switches monitoring Main Steam Line A
1E31-N009A,B,C, & D are Redundant Switches monitoring Main Steam Line B
1E31-N010A,B,C, & D are Redundant Switches monitoring Main Steam Line C
1E31-N011A,B,C, & D are Redundant Switches monitoring Main Steam Line D

The contacts off 1E31-N008A,9A,10A, & 11A are wired in series and monitor the Logic A String (Channel A1).

The contacts off 1E31-N008B,9B,10B, & 11B are wired in series and monitor the Logic B String (Channel B1).

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The contacts off 1E31-N008C,9C,10C, & 11C are wired in series and monitor the Logic C String (Channel A2).

The contacts off 1E31-N008D,9D,10D, & 11D are wired in series and monitor the Logic D String (Channel B2).

If any one switch in a Logic String trips, the respective channel trips.

If either channel A1 or A2 Trips, one of the two isolation pilot solenoids deenergizes for each Division II inboard MSIV 1B21-F022A,B,C, & D and each Division I outboard MSIV 1B21-F028A,B,C, & D.

If either channel B1 or B2 Trips, the second of the two isolation Pilot solenoids deenergizes for each Division II inboard MSIV 1B21-F022A,B,C, & D and each Division I outboard MSIV 1B21-F028A,B,C, & D.

If both isolation pilot solenoids deenergize, the Respective MSIV closes.

At the time of discovering the out of tolerance conditions, the Unit #1 Rx was in cold shutdown (operating condition #4).

Unit #1 Tech. Spec. Table 3.3.2-1, Trip Function 1.C.3 PCIS-MSL Flow-Hi, requires 2 of the 4 instruments in each Logic String to be operable in Conditions #1, 2, & 3 (Power Operations, Start-up, & Hot Shutdown).

The following were noted:

1) The Channel A2 (Logic String C) 1E31-N010C was still operable (within the LCO limits) and would have tripped upon high flow.

2) All other instruments in the Channel A2 (Logic String C) did Trip (i.e. were mechanically operable) with the greatest deviation being 10.8% from the setpoint (approximately 230% rated flow) 6% from LCO limit.

3) All instruments on the 3 other channels A1, B1, & B2 (i.e. Logic Strings A, B, & D) were within the LCO limits.

4) No Main Steam Line had more than 1 flow switch outside the LCO limit.

Accordingly, though 1E31-N008C, 9C, & 11C were outside the LCO Limits, they were still mechanically operable, and since there was multiple redundancy in the flow monitoring for each channel and for each Main Steam Line, the MSIV's would have auto closed on a High Flow condition.

Also, the tripping of any one of the 16 flow switches (13 within LCO Limits) would have alarmed in the Control Room, upon which the MSIV's could be closed via the Control Room Hand Switches.

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The functional testing portion of LIS-MS-02 is performed monthly, whereas the Calibration Portion is performed every 18 months (plus a 25% Grace Period = 4½ months).

The Previous Performance of the Calibration Portion of LIS-MS-02 was on 5/16/82.

During the Period between 5/16/82 and 2/14/84, the Unit #1 Rx has been occassionally in operating conditions #1, 2, & 3 (along with #4).

However, for reasons previously mentioned, throughout the 5/16/82 to 2/14/84 time frame, the MSIV's would have auto closed under high flow conditions within the allowable Technical Specification limits.

Safe Plant operation was maintained at all times.

IV. CORRECTIVE ACTION:

The Flow Switches found out of spec in LIS-MS-02 were immediately recalibrated (satisfactorily) upon their discovery.

Several other ITT Barton 288A Indicating d P switches (primarily dealing with Level indication) are presently being trended.

If current trending indicates an inherent problem with the Barton 288A, consideration will be given to adjusting the setpoint to compensate for the instrument drift, to inspect, repair, or replace the cam Roller Mechanism for the switches, or to replace the existing Barton 288A Model.

V. PREVIOUS OCCURRENCES:

Refer to LER numbers 82-09, 91, 102, 112, 82, 138, 152, 38, and LER numbers 83-14, 11, 23, 34, 45.

The previous performances of the LIS-MS-02 calibration were completed prior to the Unit #1 initial criticality.

VI. NAME AND TELEPHONE NUMBER OF PREPARER:

John B. Reis at extention 640.

Commonwealth Edison
LaSalle County Nuclear Station
Rural Route #1, Box 220
Marseilles, Illinois 61341
Telephone 815/357-6761

March 15, 1984

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

Dear Sir:

Reportable Occurrence Report #84-013-00, Docket #050-373 is being submitted to your office in accordance with 10 CFR 50.73.

G. J. Diederich
Superintendent
LaSalle County Station

GJD/MD/sjc

Enclosure

cc: NRC, Regional Director
INPO-Records Center
File/NRC

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