

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1): LaSalle County Station Unit 1	DOCKET NUMBER (2): 0 5 0 0 0 3 7 3 1	PAGE (3): 1 OF 0 6
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TITLE (4):  
RHR S/D Cooling High Suction Flow Switch Inoperable

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 NUMBERS
0 7	1 7	8 5	8 5	0 5 3	0 0	0 8	0 2	8 5			0 5 0 0 0

OPERATING MODE (9): 4	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 6 (Check one or more of the following) (11)									
	20.402(a)			20.406(a)			20.73(a)(2)(iv)			73.71(b)
	20.406(a)(1)(i)			20.36(a)(1)			20.73(a)(2)(v)			73.71(c)
	20.406(a)(1)(ii)			20.36(a)(2)			20.73(a)(2)(vi)			OTHER (Specify in Abstract below and in Text: NRC Form 305A)
	20.406(a)(1)(iii)			20.73(a)(2)(ii)			20.73(a)(2)(vii)(A)			
	20.406(a)(1)(iv)			20.73(a)(2)(iii)			20.73(a)(2)(viii)(B)			
20.406(a)(1)(v)			20.73(a)(2)(iv)			20.73(a)(2)(ix)				

LICENSEE CONTACT FOR THIS LER (12)										TELEPHONE NUMBER	
NAME John B. Reis, Jr., extension 463										AREA CODE	
										8 1 1 5	

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
B	J M	Z Z Z Z Z	Z	L Z N					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO				

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

On July 17, 1985, at approximately 1500 hours the Unit 1 RHR (BO) Suction Hi Flow Switches 1E31-N012AA/AB/BA/BB were found to be piped in reverse of proper system design. At the time of the discovery Unit 1 was in Cold Shutdown and LST 85-88 (a functional test from the process to the switches) was in progress whereby the differential pressures to the switches were measured via test transmitters across the instrument test taps. The cause of this error was a previously rejected Drawing Change Request (DCR) which was rejected for reasons unrelated to the sensing line piping.

Therefore during the 3/21/85 through 4/7/85 Unit 1 outage, when switches 1E31-N012A/B were removed and replaced by 1E31-N012AA/AB/BA/BB [to comply with Environmental Qualification (E.Q.) requirements] their process (Hi vs. Lo) inputs became crossed due to the related drawings having never been revised. The reversal of the process lines prevents automatic system isolation during high flow conditions but provides Control Room indication that the condition exists. Manual system isolation was available in the Control Room during the time the process lines were crossed.

All piping and drawing concerns were resolved via a Modification Field Change Request and LST 85-88 was satisfactorily reperformed on 7/22/85.

At the time of the 7/17/85 piping error discovery, both Unit 1 and Unit 2 were in Cold Shutdown. Prior to either the Unit 1 or Unit 2 startup, all rejected DCR's were reviewed for inadvertent omissions of design field changes. No significant discrepancies were discovered.

All special tests associated with the E.Q. change outs were verified to be satisfactorily completed for the given unit prior to its startup.

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TEXT (If more space is required, use additional NRC Form 368A's (1/77))

I. EVENT DESCRIPTION

On July 17, 1985, at approximately 1500 hours, the Unit 1 RHR (BO) Suction Hi Flow Switches, 1E31-N012AA/AB/BA/BB were found to be piped in reverse of proper system design. 1E31-N012AA and AB share the same Hi and Low Process Lines to panel 1H22-P018 and 1E31-N012BA and BB share the same Hi and Low Process Lines to panel 1H22-P021.

At the time of the discovery, Unit 1 was in Cold Shutdown, Operational Condition 4, and Sections F.9 through F.12 of special test procedure LST 85-88, "Unit 1 Flow Switch Sensing Line Verification", was in progress. LST 85-88 is a functional test from the process to the switches. With the RHR "A" Loop Shutdown Cooling Mode in operation, system flow was varied while the differential pressure across the flow switches was measured via differential pressure test transmitters across the test taps. These test transmitters are designed to measure positive as well as negative differential pressures.

In each case the differential pressure reading was opposite in sign of the value required by proper primary containment isolation (JM) system design, such that the required isolation actions of the flow switches would not have occurred.

The installation of the RHR Suction High Flow Switches 1E31-N012AA/AB/BA/BB were performed during the Unit 1 3/21/85 through 4/7/85 outage to implement the replacement of the original flow switches 1E31-N012A and B as part of modification package M-1-1-84-091. This modification changed several Unit 1 differential pressure flow and level instruments to meet Environmental Qualification Rule (E.Q.) requirements. The sequence of identifying the incorrect instrument piping was as follows:

3/21/85	Unit 1 outage begins
3/29/85	1E31-N012AA/AB/BA/BB calibrated and declared operable
4/07/85	Outage ends, Unit 1 startup begins
4/07/85 to 5/11/85	Unit 1 in operation
5/12/85 to 5/31/85	Unit 1 in operation
6/10/85 to 6/29/85	Unit 1 in operation
7/01/85 to 7/12/85	Unit 1 in operation
7/12/85	Another Unit 1 outage begins
7/17/85	LST 85-88 performed on 1E31-N012AA/AB/BA/BB
7/17/85	1E31-N012AA/AB/BA/BB process lines were traced back to the drywell penetrations/outboard root valves and found to be satisfactory per the M-1-1-84-091 revised controls and instrumentation (C&ID) Drawing M-2096-5, Revision C (with ECN PFL-LS outstanding but included)
7/17/85	Work Request #L50393 was generated to repair the 1E31-N012AA and AB piping
7/17/85	Work Request #L50394 was generated to repair the 1E31-N012BA and BB piping

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LaSalle County Station Unit 1	050003713	85	-053	-00	03	OF	06

TEXT (If more space is required, use additional NRC Form 388A's) (17)

## II. CAUSE

Following the identification of the problem, the 1E31-N012AA/AB/BA/BB process lines were traced back to the outboard root valves and drywell penetrations and were found to be satisfactory per the M-1-1-84-091 revised C&ID drawing.

Per these results, an investigation of drawing M-2096-5 commenced with the following comments:

On 5/10/82 it had been discovered that the original flow switches 1E31-N012A and 1E31-N012B were piped backwards due to the Hi and Lo process lines being reversed inside the containment (NH). Accordingly Modification #M-1-1-82-054 was implemented to correct the piping and (in addition) install pressure snubbers. Snubbers were added and the repiping was performed by reversing the tubing locally at the instruments.

Upon satisfactory resolution of M-1-1-82-054, Drawing Change Request (DCR) #73-83 was submitted to reflect: 1) the inclusion of pressure snubbers, and 2) the changes to the process line, root valve and EFCV numbers associated with 1E31-N012A and B (with the drywell penetration numbers remaining the same). Based on their request for more information with regard to the snubber installation, Sargent & Lundy rejected DCR 73-83.

Accordingly DCR 73-83 (which included the revised drawing #M-2096-5) was mistakenly closed out without the appropriate changes being made.

Therefore during the 3/21/85 through 4/7/85 outage when 1E31-N012A and B were removed and later replaced by 1E31-N012AA/AB/BA/BB, their process inputs (Hi vs Lo) became crossed, due to drawing #M-2096-5 having never been revised.

## III. PROBABLE CONSEQUENCES

The RHR S/D cooling flow switches are designed to be piped in the following manner:

1. The process (elbow tap) high pressure lines go to the Hi side of 1E31-N012AA and 1E31-N012BA and to the Lo side of 1E31-N012AB and 1E31-N012BB.
2. The process (elbow tap) low pressure lines go to the Lo side of 1E31-N012AA and 1E31-N012BA and to the Hi side of 1E31-N012AB and 1E31-N012BB.

The various switch actions are as follows: (initiating on high flow or a sensing line break)

1. DPS - 1E31-N012AA, opens at 180.0" W.C., increasing, and will initiate auto closure of the following valves:
  - a. RHR Shutdown Cooling Inboard Suction Isolation Valve, 1E12-F008.

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

## III. PROBABLE CONSEQUENCES (Continued)

- b. RHR Reactor Head Spray Isolation Valve, 1E12-F023
- c. RHR Ht. Exch. 1A Shutdown Cooling Disch. Isolation Valve, 1E12-F053A
- d. RHR Ht. Exch. 1B Shutdown Cooling Disch. Isolation Valve, 1E12-F053B
2. DPS - 1E31-N012BA, opens at 180.0" W.C., increasing and will initiate auto closure of the following valves:
  - a. RHR Shutdown Cooling Outboard Suction Isolation Valve, 1E12-F009
  - b. RHR Ht. Exch. 1A Shutdown Cooling Testable Check Bypass Valve, 1E12-F099A
  - c. RHR Ht. Exch. 1B Shutdown Cooling Testable Check Bypass Valve, 1E12-F099B
3. DPS - 1E31-N012AB/N012BB, close at 180.0" W.C., increasing and initiate computer point #D972/D973, which will cause alarm typer to print "RHR FLOW DP DIV 1/2 HIGH" (after a brief time delay).
4. If the system is operating in the Shutdown Cooling Mode, actuation of either 1E31-N012AA or BA will cause the RHR pumps to trip.

1E31-N012AB/BB are designed to protect against a break (only) in the High Pressure Process Sensing Line. Such a break would prevent 1E31-N012AA/BA from tripping on an actual high flow condition, thereby preventing automatic system isolation.

However the aforementioned break would result in the Low Pressure Sensing Line having a pressure greater than the High Pressure Line, resulting in 1E31-N012AB/BB tripping and providing Control Room notification.

Therefore reversal of the process lines prevents automatic system isolation during high flow conditions, but provides Control Room indication that the condition exists.

The crossed sensing lines during the period between 3/29/85 and 7/17/85 had a minimal impact on plant safety and reliability, for the following reasons:

1. Automatic High Flow Annunciation and a means for manual isolation of the RHR S/D Cooling system were present in the Control Room at all times.
2. Although Technical Specification 3.3.2 requires the S/D Cooling Isolation Logic system to be operable in Conditions 1, 2 and 3 (Startup, Hot Shutdown, Run), normal unit operation compels that all of the valves affected by switches 1E31-N012AA/BA be normally closed, due to the 135 psig vessel pressure interlock with the RHR S/D Cooling system.

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APPROVED OMB NO 3150-0104  
EXPIRES 8/31/85

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LaSalle County Station Unit 1	05000373	85	053	010	05	OF	016

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

IV. CORRECTIVE ACTION

Upon resolution of the 1E31-N012AA/AB/BA/BB piping and switch recalibration, LST 85-88 was satisfactorily reperformed on 7/22/85. In conjunction with LST 85-88, the piping from the affected switch taps to the associated root valves were also satisfactorily verified on 7/22/85 via LST 85-106.

In addition, the Unit 1 differential pressure reactor vessel level switches replaced by E.Q. Modification #M-1-1-84-091 and M-1-1-84-106 were satisfactorily functionally tested via LST 85-99.

It should be noted that the following special tests were satisfactorily performed upon replacement of those Unit 2 differential flow and level switches specified in E.Q. Modifications M-1-2-84-136 and M-1-2-84-156.

1. LST 85-82, Unit 2 Level Instrument Verification - Completed 6/21/85
2. LST 85-89, Unit 2 Flow Switch Sensing Line Verification - Completed 7/11/85
3. LST 85-91, Unit 2 Steam Related Differential Pressure Switches/Transmitters - Completed 7/9/85

At the time of the 7/17/85 discovery of the piping error both Unit 1 and Unit 2 were in Cold Shutdown.

Prior to either the Unit 1 or Unit 2 startup, all rejected DCR's were reviewed for inadvertent omissions of design field changes. No significant discrepancies were discovered.

Prior to the 7/21/85 Unit 2 startup, LST's 85-82, 89, and 91 were satisfactorily completed.

And prior to the 7/27/85 Unit 1 startup, LST's 85-88, 89, and 106 were satisfactorily completed.

V. PREVIOUS OCCURRENCES

Special tests LST 85-82, 88, 89, 91, 99 and 106 were generated in reply to concerns over those differential pressure flow and level instruments replaced by the E.Q. related Modifications (M-1-1-84-091, M-1-1-84-106, M-1-2-84-136 and M-1-2-84-156).

The concerns were based on the following occurrences:

1. LER 374/85-029-00, on 6/10/85 Unit 2 RPV Low Level Switches 2B21-N037AA and AB were found to be piped in reverse of system design.
2. LER 374/85-031-00, on 6/22/85 Unit 2 RHR Suction High Flow Isolation Switches 2E12-N012AA and AB were found to be piped in reverse of system design.

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V. PREVIOUS OCCURRENCES (Continued)

The original discovery of the Unit 1 RHR suction high flow isolation switches 1E12-N012A and B being piped backwards was documented by LER 373/82-012/03L-0, dated 5/5/82.

VI. NAME AND TELEPHONE NUMBER OF PREPARER

John E. Reis, Jr., 815/357-6761, extension 463.



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

August 2, 1985

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

Dear Sir:

Reportable Occurrence Report #85-053-00, Docket #050-373 is being submitted to your office in accordance with 10CFR 50.73.

*for R.D. Bialys*  
G. J. Diederich  
Station Manager  
LaSalle County Station

GJD/DRR/kg

Enclosure

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

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