

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)  
LaSalle County Station Unit 2DOCKET NUMBER (2)  
0 5 0 0 0 3 7 4

PAGE (3)

1 OF 0 7

TITLE (4)  
Reactor Water Cleanup Vent High Differential Temperature

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

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)									
POWER LEVEL (10) 0 0 0	4	20.402(a)	20.405(a)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)					
		20.405(a)(1)(i)	50.73(a)(2)(v)	73.71(a)							
		20.405(a)(1)(ii)	50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 365A)							
		20.405(a)(1)(iii)	50.73(a)(2)(vii)(A)								
		20.405(a)(1)(iv)	50.73(a)(2)(vii)(B)								
		20.405(a)(1)(v)	50.73(a)(2)(viii)		50.73(a)(2)(ix)						

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
John B. Reis, Jr., Ext. 640	AREA CODE 8 1 5 3 5 7 1 - 6 7 6 1

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	I J O T I S R	2 7 9	N						
B	V A O D M P A	3 4 0	N						

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

At 2130 on 2/23/84, the Unit 2 Reactor Water Cleanup (RWC) System isolated on a Pump Room 'C' Ventilation Differential Temperature (delta T) High. At the time of the RWC isolation, the Unit 2 reactor was in Cold Shutdown, Operating Condition 4. The RWC Leak Detection System was then bypassed, the isolation signal reset, and the RWC System restarted. The cause of the RWC isolation appears to be the result of a normal operating temperature gradient across the Pump Rooms due to cold reactor building air blasting the inlet temperature elements via the room gravity dampers. Action Item Records #1-84-67030 and 1-84-67038, and Work Request L34337 have been generated to investigate the Unit 2 RWC Pump Room ventilation problem with recommendations to move or shield the affected inlet temperature elements, and to repair the Unit 2 Reactor Building ventilation flow sensing equipment to allow the blast coils to energize per design.

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APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

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		84	006	00	02	OF 07

TEXT (If more space is required, use additional NRC Form 386A's) (17)

I. EVENT DESCRIPTION

At 2130 on 2/23/84, the Unit 2 Reactor Water Cleanup (RWCU, CE), System isolated due to a high Pump Room 'C' delta T trip. At the time of the RWCU isolation, the Unit 2 reactor was in Cold Shutdown, Operating Condition 4, with a vessel hydrostatic test in progress. Upon investigation, the following was discovered:

The Division I RWCU Pump Room 'C' Leak Detection (LD, IJ) delta T switch 2E31-N600E read approximately 18 to 20 degrees F, whereas the Division II RWCU Pump Room 'C' Leak Detection delta T switch 2E31-N600F read approximately 1 to 2 degrees F.

The RWCU Pump Room A, B and C Leak Detection delta T switch trip points are 13 degrees +0/-3 F with a Limiting Condition of Operation limit of less than or equal to 19 degrees F. (Refer to Unit 2 Technical Specification Table 3.3.2-2 and LIS-RT-203.)

Upon discovery of this condition, the RWCU/Leak Detection System was bypassed via the key lock switches 2E31A-S1A and 2E31A-S1B at 2H13-P632 and 2H13-P642, respectively. The RWCU System was then restarted. In addition, delta T switch 2E31-N600E was listed in the Degraded Equipment Log and work request L33465 was generated to recalibrate the switch in accordance with LIS-RT-203.

II. CAUSE

LIS-RT-203, the Unit 2 RWCU Area Vent High delta T Isolation Calibration was last performed on 2/9/84 with the following comments:

1. For switch 2E31-N600E (Div. I, 'C' Pump Room) the "As Found" trip value was 14.1 degrees F increasing and the "As Left" trip value was 11.5 degrees F increasing, per the DVM test meter reading. The local control room indicator was reading 2 degrees F low per the DVM test meter (i.e., 2E31-N600E was tripping high and indicating low with respect to the test meter.
2. For switch 2E31-N600H (Div. II, 'A' Nonregenerative Heat Exchanger Room) the "As Found" trip value was 96.75 degrees F increasing and the "As Left" trip value was 83 degrees F increasing, per the DVM test meter reading. The trip per the Control Room indicator also read high with respect to the DVM test input.
3. For switch 2E31-N600B (Div. II, 'A' Pump Room), though the trip point per the local indicator read 2.5 degrees F above the actual input, the switch did trip at the satisfactory value per the DVM reading (i.e., the indicator was reading slightly high, but the switch was tripping at the correct point.

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

## II. CAUSE (Continued)

4. All other instrument switch trips were within the spec Limiting Condition of Operation limits (per the DVM reading).

Therefore, if anything, the delta T switches were trending to trip at a delta T higher than the required trip value. If instrument drifting were the problem, then the switches' trend would be to trip at a delta T lower than the required trip (i.e., be out of spec in the low direction).

Upon a 2/27/83 investigation of the Unit 2 B/C RWCU Pump Room(s), the following was discovered:

The air flows through the B/C Pump Room from the 761 ft. main floor through the east B/C Pump Room Gravity Damper, 2VR51Y (above the door), on to the east valve aisle wall, where it dissipates. Located directly in this ventilation blast area is the inlet delta T (Div. I Pump 'C' room) Temperature Element 2E31-N001E. As a result of its location, 2E31-N001E is effectively kept at the Reactor Building temperature, which is less than the Pump B/C Room ambient temperature. The Div. II Pump 'C' room, the Div. I Pump B Room, and Div. II Pump B Room inlet delta T detectors 2E31-N001F, C and D are not in the ventilation current's path and read a higher inlet temperature (on the order of the Pump Rooms' ambient temperatures). Also, the outlet temperature elements 2E31-N002E, F, C and D are located directly above the pump motors (approximately 3 ft.) and effectively measure the motors' thermal output.

Thirdly, during the time of the RWCU pump trip, the RWCU System was pumping much hotter water than the system normally handles. During the hydrostatic test, the system was used for level control. Accordingly the filter demineralizers were bypassed, the high water temperature switch 2G33-N008 was jumpered-out, and the RWCU System was pumping approximately 170 degrees F reactor water. Under normal operating conditions, when the water temperature at the pump outlet/filter demineralizer inlet exceeds 140 degrees F, the switch opens, valve 2G33-F004 closes, and the pumps trip (to prevent the resins from melting). This increase in the RWCU operating water temperature further increases the ambient temperature for the pump cubicle region, and further increases the delta T across the room, especially for switch 2E31-N600E whose inlet temperature element 2E31-N001E is kept constant by the cold air blast from the inlet gravity damper. Accordingly, the pump trip does not appear to be the result of leakage or instrument drifting, but rather the result of a temperature gradient between 2E31-N001E and 2E. This is due to localized cooling via a direct blast of cold air on 2E31-N001E from the Pump Room's east side gravity damper, with the 2 valve aisle walls creating ventilation current barriers and thermal barriers, combined with the pumping of higher than normally allowed RWCU water temperatures through the system.

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

## II. CAUSE (Continued)

In addition, on 2/27/84 the following was noted:

The inlet gravity damper 2VR51Y vanes were found to be pointing at a 45 degree angle downward (into the rooms) with respect to the horizon, and 2E31-N001E was receiving a cold blast of air. Both outlet dampers (2VR17Y and 2VR18Y) were then simultaneously cycled (manually) from full open to full closed with the inlet gravity damper showing no noticeable movement.

On 2/28/84, the gravity damper was found to be fully (greater than 95 percent) closed with 2E31-N001E receiving no strong air currents. It appears that gravity damper 2VR51Y requires readjustment. On neither day were the B or C RWCU pumps running. An investigation of the Unit 1 B/C RWCU Pump Room revealed that the inlet gravity damper vanes were pointing at a 10 degree angle upward into the room, with respect to the horizon. Since the bottom of the damper is above the entrance door (approximately 10 ft. above the floor) while Temperature Element 1E31-N001E is only approximately 5.5 ft. above the floor, and since the damper is pointing up (approximately 10 degrees), 1E31-N001E does not receive a direct blast of cold air. However, at the time of the investigation, the unit was shut down and neither RWCU pump was running. Accordingly, the position of the gravity damper during normal operations is not known, and may differ from what was observed.

The Unit 2 Reactor Building Ventilation (VR, VA) Test Engineer has been notified of the ventilation problems in the RWCU Pump Rooms and is currently investigating (with Station Nuclear Engineering Department and Sargent and Lundy assistance) to determine what balancing corrections are to be made. It should be noted that during both the pump trip and the subsequent investigation, two Unit 2 Reactor Building Ventilation supply and two Unit 2 Reactor Building Ventilation return fans were operating. In addition to 2E31-N001E (in the RWCU B/C Pump Room), a similar problem with the inlet Temperature Element 2E31-N001B (in the RWCU 'A' Pump Room) receiving a direct blast of cold air was noticed.

## III. PROBABLE CONSEQUENCE OF THE OCCURRENCE

The RWCU/Leak Detection System operates in the following manner:

Along with a single loss of power contact, one delta T and one ambient high temperature switch from each Pump Room and Non Regenerative Heat Exchanger Room is wired in series to make up the 'A' Leak Detection string (ESS Div. I):



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TEXT (If more space is required, use additional NRC Form 364A's) (17)

## III. PROBABLE CONSEQUENCE OF THE OCCURRENCE (Continued)

2E31-N600A, 'A' CE Pump Room delta T switch  
2E31-N601A, 'A' CE Pump Room Hi Ambient Temperature switch  
2E31-N600C, 'B' CE Pump Room delta T switch  
2E31-N601C, 'B' CE Pump Room Hi Ambient Temperature switch  
2E31-N600E, 'C' CE Pump Room delta T switch  
2E31-N601E, 'C' CE Pump Room Hi Ambient Temperature switch  
2E31-N600G, 'A' CE Nonregen HX Room delta T switch  
2E31-N601G, 'A' CE Nonregen HX Room High Ambient Temperature switch  
2E31-N600J, 'B' CE Nonregen HX Room delta T switch  
2E31-N601J, 'B' CE Nonregen HX Room High Ambient Temperature switch  
K7A (T1/M1), Power Failure

If any one of these 11 contacts are open the RWCU isolation ESS Div. I channel trips, closing the RWCU outboard isolation valve 2G33-F004, and tripping the RWCU pumps 2G33-C001A, B, and C (if running).

A redundant RWCU/Leak Detection System exists and operates in the following manner. Along with a single loss of power contact, one delta T and one ambient high temperature switch from each Pump Room and Nonregen. HX Room is wired in series to make up the 'B' Leak Detection string (ESS Div. II):

2E31-N600B, 'A' CE Pump Room delta T switch  
2E31-N601B, 'A' CE Pump Room Hi Ambient Temperature switch  
2E31-N600D, 'B' CE Pump Room Delta T switch  
2E31-N601D, 'B' CE Pump Room High Ambient Temperature switch  
2E31-N600F, 'C' CE Pump Room delta T switch  
2E31-N601F, 'C' CE Pump Room High Ambient Temperature switch  
2E31-N600H, 'A' CE Nonregen HX Room delta T switch  
2E31-N601H, 'A' CE Nonregen HX Room High Ambient Temperature switch  
2E31-N600K, 'B' CE Nonregen HX Room delta T switch  
2E31-N600K, 'B' CE Nonregen HX Room High Ambient Temperature switch  
K7B (T1/M1), Power Failure

If any one of these 11 contacts open, the RWCU isolation ESS Div. II channel trips, closing the RWCU inboard isolation valve 2G33-F001, and tripping the RWCU pumps 2G33-C001A, B and C (if running).

The associated trip points and Limiting Condition of Operation limits for the delta T and high ambient are as follows:

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

## III. PROBABLE CONSEQUENCE OF THE OCCURRENCE (Continued)

Pump A, B and C Room delta T: 2E31-N600A, B, C, D, E and F trip point 13 degrees +0/-3 F, Limiting Condition of Operation limit less than or equal to 19 degrees F.

Pump A, B and C Room high ambient: 2E31-N601A, B, C, D, E and F trip point 116 degrees +0/-6 F, Limiting Condition of Operating limit less than or equal to 122 degrees F.

HX A and B Room delta T: 2E31-N600G, H, J and K trip point 85 degrees +0/-3 F, Limiting Condition of Operation limit less than or equal to 91 degrees F.

HX A and B Room high ambient: 2E31-N601G, H, J and K trip point 181 degrees +0/-6 F, Limiting Condition of Operation limit less than or equal to 187 degrees F.

(Refer to Unit 2 Technical Specification Table 3.3.2-2 and LIS-RT-203.)

The Division I pump and HX Room delta T switches are wired in parallel and alarm at 2H13-P601, window C311. The Division I pump and HX Room high ambient temperature switches are wired in parallel and alarm at 2H13-P601, window C211. The Division I Power Failure and Test Bypass alarms are wired in parallel and alarm at 2H13-P601, window C309. The Division II pump and HX Room delta T switches are wired in parallel and alarm at 2H13-P601, window B506. The Division II pump and HX Room high ambient temperature switches are wired in parallel and alarm at 2H13-P601, window B505. The Division II Power Failure and Test Bypass alarms are wired in parallel and alarm at 2H13-P601, window B504. In addition, each Division I delta T and ambient temperature switch has an individual alarm at 2H13-P632 (which auto resets), and each Division II delta T and ambient temperature switch has an individual alarm at 2H13-P642 (which auto resets).

At the time of the RWCU isolation/trip, the Unit 2 Reactor was in Cold Shutdown (Operating Condition 4). The Unit 2 Technical Specification Table 3.3.2-1, Trip Function 3.e (RWCU Isolation) "Pump Area Ventilation delta T-High" requires the trip system to be operable only in Operating Conditions 1, Power Operation, 2, Startup, and 3, Hot Shutdown. Upon an actuation of 2E31-N600E, a group 5 isolation and RWCU pump trip were received, signifying all components operated per design. Since, at the time of the trip, the plant was in Operating Condition 4, Cold Shutdown, (which does not require RWCU operability) and since the RWCU filter demineralizers were already being bypassed per hydrostatic procedure LLP 84-5 (with the RWCU system only being used as a backup to CRD for vessel level control), the act of declaring 2E31-N600E inoperable, bypassing the Leak Detection/RWCU Division I and II channels, and restarting the RWCU pump had no effect upon plant operability or upon Technical Specifications (i.e., safe plant operation

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U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 3/31/85

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

III. PROBABLE CONSEQUENCE OF THE OCCURRENCE (Continued)

was maintained at all times). Though their tripping function has been bypassed, the Division I and Division II status of the Unit 2 RWCU/Leak Detection pump and Nonregenerative Heat Exchanger Room delta T and high ambient temperature switches may be monitored by their respective 2H13-P601, and P642 Control Room alarms.

IV. CORRECTIVE ACTION

In addition to work request L33465, checking the calibration of 2E31-N600E, the following actions have been taken:

1. The Unit 2 Reactor Building Ventilation (VR, VA) Test Engineer has been notified of the ventilation problem in the RWCU Pump Rooms and is currently investigating (with Station Nuclear Engineering Department and Sargent and Lundy assistance) as to what balancing corrections are to be made.
2. Action Item Records 1-84-67038 and 1-84-67030 have been generated to investigate the Unit 2 RWCU Pump Room ventilation problem with the following recommendations:
  - a. to consider moving 2E31-N001B in the 2A RWCU Pump Room to a location similar to that in Unit 1
  - b. to consider moving 2E31-N001E to a location out of the air stream coming through 2VR051Y
  - c. to consider shielding for 2E31-N100B and 2E31-N100E

V. PREVIOUS OCCURRENCES

A previous occurrence associated with the RWCU/Leak Detection System is covered by LER 84-007-00, Docket 50-374. This occurrence was discussed (as applicable) in Section II and Section III of this LER.

Since the initiation of this LER, the Unit 2 vessel hydro has been completed and the vessel water cooled (to approximately 120 degrees). Presently the 'A' RWCU pump is running and no RWCU/Leak detection alarms are present. The RWCU/Leak Detection delta T and ambient temperature values will be recorded for the various test conditions during the Unit 2 performance of LOD-15.

VI. PREPARED BY

John Reis, extension 640.



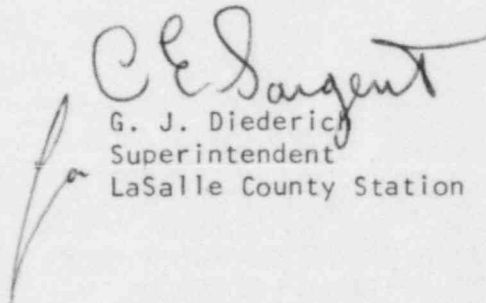
**Commonwealth Edison**  
LaSalle County Nuclear Station  
Rural Route #1, Box 220  
Marseilles, Illinois 61341  
Telephone 815/357-6761

March 22, 1984

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

Dear Sir:

Reportable Occurrence Report #84-006-00, Docket #050-374 is being submitted to your office in accordance with 10 CFR 50.73.

  
G. J. Diederich  
Superintendent  
LaSalle County Station

GJD/MLD/kg

Enclosure

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

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