

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) LaSalle County Station Unit 1	DOCKET NUMBER (2) 0 5   0 0   0 3   7 3	PAGE (3) 1 OF 0   4
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TITLE (4)  
Reactor Scram from Low Vacuum Trip of Turbine Generator

EVENT DATE (5)			LER NUMBER (8)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (9)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)
0 5	3 1	8 4	8 4	0 2   9	0 0	0 6	1 3	8 4			0 5   0 0   0 0
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OPERATING MODE (8) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)											
	20.402(b)			20.406(c)			X 80.73(a)(2)(iv)			73.71(b)		
	20.406(a)(1)(i)			80.36(e)(1)			80.73(a)(2)(v)			73.71(e)		
	20.406(a)(1)(ii)			80.76(e)(2)			80.73(a)(2)(vii)			OTHER (Specify in Abstract below and in Text, NRC Form 366A)		
	20.406(a)(1)(iii)			80.73(a)(2)(i)			80.73(a)(2)(viii)(A)					
	20.406(a)(1)(iv)			80.73(a)(2)(ii)			80.73(a)(2)(viii)(B)					
20.406(a)(1)(v)			80.73(a)(2)(iii)			80.73(a)(2)(ix)						
POWER LEVEL (10) 0 5   5												

LICENSEE CONTACT FOR THIS LER (12)									
NAME Baron S. Westphal, extension 246							TELEPHONE NUMBER AREA CODE 8 1 5   3 1 5 7   1 - 1 6 7 1 6 1 1		

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS	
X	S   D   S   E   A   L		0   0   0   0	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)

At 1615 on 5/31/84 a Low Vacuum Turbine-Generator Trip occurred at 55% reactor thermal power which subsequently resulted in a scram from the Turbine Stop Valve Closure. The reactor water level and pressure transients were minor not requiring ECCS, RCIC or SRV actuation. Condenser vacuum recovered after the trip; consequently the Turbine Bypass Valves and a Turbine Driven Reactor Feed Pump were used to control pressure and water level. Analysis of the event revealed the vacuum loss was probably the result of a temperature transient that occurred while Turbine Building ventilation was shut down and a surveillance that was performed to fill Off Gas (OG) Loop seals which may actually have blown one or more loop seals. A combination of the two caused increased air leakage and high condensate temperature which overloaded the SJAE's resulting in low vacuum. The only component failure identified was a stuck pen on the OG flow recorder in the Control Room - local indication showed a high flowrate. Corrective action included incorporation of the local OG flow indicator into the Equipment Attendant rounds for comparison with the flow recorder, repair of the OG flow recorder and a revision to the loop seal fill surveillance to incorporate cautions to prevent loop seal loss during filling operations.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		84	029	00	02	OF 04

TEXT (if more space is required, use additional NRC Form 388A w/17)

I. EVENT DESCRIPTION

On 5/31/84 at 1615, Unit 1 scrambled on the Reactor Protection System (JC, RPS) signal indicating the Turbine Stop Valves (TA, TSV) were not full open. This was the result of a Turbine-Generator (TA, T/G) trip on low vacuum. Unit 1 had been operating at 99% when Condenser (SG) vacuum began decreasing, apparently because of increased air in-leakage as indicated by Off Gas (WF, OG) flowrate, which was very high (greater than 200 SCFM; approximately 50 SCFM is normal). As vacuum continued to decrease, Reactor (AC) power was reduced to lower Turbine-Generator load. The vacuum transient lasted about an hour during which Operations tried to determine the source of air inleakage. The Turbine-Generator trip and subsequent scram occurred at 55% power. Neither the Reactor Core Isolation Cooling (BN, RCIC) system nor the Emergency Core Cooling Systems (JE, ECCS) were challenged on the ensuing reactor water level and pressure transient. After the scram, vacuum recovered so the condenser was available for reactor pressure control.

II. CAUSE

The vacuum loss is believed to be the culmination of a series of events which eventually led to exceeding the Steam Jet Air Ejector (SH, SJAE) capacity due to a loss of loop seals to the condenser and an elevated condensate temperature. On 5/30/84 at approximately 2030, an inch and a half of main condenser vacuum was lost for a brief period and then restored without corrective action by Operating personnel. During the investigation for possible causes on 5/31/84 the local Off Gas flow indicator (FI) was noticed to be reading 210 SCFM while the flow recorder (FR) in the Control Room was indicating only 50 SCFM. Further investigation revealed the flow recorder pen was stuck at 50 SCFM. Once the high Off Gas flow was recognized, the shift began filling all the Off Gas loop seals per surveillance LOS-OG-M2. The surveillance was completed at 1420 on 5/31/84. However, the filling of the loop seals while operating has always been a precarious task. The loop seals, if not filled carefully, can cause water carryover into the Off Gas system or the actual loss of a seal. Either situation can adversely affect the operation of the Off Gas system and in turn condenser vacuum.

During a continuing search for possible air leakage into the condenser, the equipment sump (WK) to which the Steam Packing Exhauster (TC, SPE) loop seal overflows was inspected and found to be pulling air back through the seal and into the condenser. About 5 minutes later main condenser vacuum began to decrease. The equipment sump was filled with water and the vacuum decrease stopped briefly. However, since additional Off Gas components may have been affected when LOS-OG-M2 was performed, and because condensate temperature had increased significantly (the result of decreased condenser vacuum), the Off Gas air ejectors could not recover from the transient. Condenser vacuum continued to decrease with the Turbine Generator eventually tripping on low

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TEXT (If more space is required, use additional NRC Form 366A (1))

II. CAUSE (Continued)

vacuum and the subsequent reactor scram.

The lost SPE loop seal and the high OG flowrate were the only abnormal conditions discovered in the investigation of the small vacuum transient of 5/30/84, and during and after the major vacuum transient and eventual trip of 5/31/84. A review of activities showed that there were two evolutions which may have affected the Off Gas loop seals. One of these was the performance of LOS-OG-M2 previously mentioned. The other is a shutdown of Turbine Building Ventilation (VK, VT) for a period of time on the evening of 5/30/84 to install a repaired exhaust fan. Turbine Building temperatures in the area of the SJAE and SPE loop seals increased enough to interrupt the repair operations while VT was restarted to cool these areas. This occurred just shortly before the vacuum transient on 5/30/84. Suspected area temperatures were high enough to cause a loop seal boil-off and result in the minor transient that evening. SJAE capacity was apparently adequate to overcome the air inleakage.

Two additional facts also reduce the possibility of an equipment failure as the root cause. Once the unit tripped on 5/31/84, vacuum was never totally lost. In fact, it was eventually fully recovered. Also, OG flow was substantially reduced during the subsequent unit restart. It returned to a normal value of 35-50 SCFM.

III. PROBABLE CONSEQUENCES OF THE OCCURRENCE

During the transient the health and safety of the public were protected at all times. All of ECCS was available, but in fact the reactor water level and pressure transient were minor enough not to require a response or a Safety Relief Valve (SB, SRV) actuation. The Turbine Bypass valves (JI, BPV) functioned initially to control pressure, and a Turbine Driven Reactor Feed Pump (SK, TDRFP) was kept on line to maintain reactor water level and control reactor pressure. Also, the increased Off Gas flow-rate did not result in an increased release rate via the main stack.

IV. CORRECTIVE ACTIONS

1. The OG flow recorder in the Control Room was repaired (Work Request L37284).
2. The Station will incorporate the local OG flow indicator into the Equipment Attendant rounds to permit comparison with the Control Room flow recorder. (AIR 01-84-67092)

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

IV. CORRECTIVE ACTIONS (Continued)

- The Station will revise LOS-OG-M2 to include a caution when filling loop seals during plant operation. Also, the frequency of LOS-OG-M2 will be reduced to Unit Startups and after major Off Gas Transients. (AIR 01-84-67092)

V. PREVIOUS OCCURRENCES

Two loss of vacuum events resulting in a unit scram have occurred in 1984. However, these were equipment failure related and are not similar to the event described in this LER.

VI. NAME AND TELEPHONE NUMBER OF PREPARER

Baron S. Westphal, 815-357-6761, extension 246.



**Commonwealth Edison**  
LaSalle County Nuclear Station  
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June 13, 1984

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

Dear Sir:

Reportable Occurrence Report #84-029-00, Docket #050-373 is being submitted to your office in accordance with 10 CFR 50.73.

G. J. Diederich  
Superintendent  
LaSalle County Station

GJD/MLD/kg

Enclosure

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

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