

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) LaSalle County Station Unit 2

DOCKET NUMBER (2)

0 5 0 0 0 3 7 4

PAGE (3)

1 OF 0 4

TITLE (4) HPCS Discharge Relief Valve Failure

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	6	1	5	8	4	8	4	0	3	0	0
0	6	1	5	8	4	8	4	0	3	0	0

OPERATING MODE (9)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)																																				
1	<table border="1"><tr><td>20.407(b)</td><td><input checked="" type="checkbox"/></td><td>20.408(c)</td><td><input checked="" type="checkbox"/></td><td>20.731(b)</td><td><input type="checkbox"/></td></tr><tr><td>20.408(a)(1)(i)</td><td><input type="checkbox"/></td><td>20.36(c)(1)</td><td><input type="checkbox"/></td><td>20.731(c)</td><td><input type="checkbox"/></td></tr><tr><td>20.408(a)(1)(ii)</td><td><input type="checkbox"/></td><td>20.36(c)(2)</td><td><input type="checkbox"/></td><td>OTHER (Specify in Abstract below and in Text, NRC Form 366A)</td><td><input type="checkbox"/></td></tr><tr><td>20.408(a)(1)(iii)</td><td><input checked="" type="checkbox"/></td><td>20.731(a)(2)(i)</td><td><input type="checkbox"/></td><td></td><td><input type="checkbox"/></td></tr><tr><td>20.408(a)(1)(iv)</td><td><input type="checkbox"/></td><td>20.731(a)(2)(ii)</td><td><input type="checkbox"/></td><td></td><td><input type="checkbox"/></td></tr><tr><td>20.408(a)(1)(v)</td><td><input type="checkbox"/></td><td>20.731(a)(2)(iii)</td><td><input type="checkbox"/></td><td></td><td><input type="checkbox"/></td></tr></table>	20.407(b)	<input checked="" type="checkbox"/>	20.408(c)	<input checked="" type="checkbox"/>	20.731(b)	<input type="checkbox"/>	20.408(a)(1)(i)	<input type="checkbox"/>	20.36(c)(1)	<input type="checkbox"/>	20.731(c)	<input type="checkbox"/>	20.408(a)(1)(ii)	<input type="checkbox"/>	20.36(c)(2)	<input type="checkbox"/>	OTHER (Specify in Abstract below and in Text, NRC Form 366A)	<input type="checkbox"/>	20.408(a)(1)(iii)	<input checked="" type="checkbox"/>	20.731(a)(2)(i)	<input type="checkbox"/>		<input type="checkbox"/>	20.408(a)(1)(iv)	<input type="checkbox"/>	20.731(a)(2)(ii)	<input type="checkbox"/>		<input type="checkbox"/>	20.408(a)(1)(v)	<input type="checkbox"/>	20.731(a)(2)(iii)	<input type="checkbox"/>		<input type="checkbox"/>
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LICENSEE CONTACT FOR THIS LER (12)

NAME Vincent Masterson, E.A., Extension 499

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	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
B	BG	RIV	C1711	0	Y				

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)

On June 15, 1984, the High Pressure Core Spray System (HPCS, BG) was declared inoperable as the result of the Unit 2 HPCS Discharge Relief Valve (2E22-F035) internal bellows seal failure. A Generating Station Emergency Procedure (GSEP) "Unusual Event" was declared and the Reactor was shutdown within 12 hours in accordance with Technical Specification 3.6.1.1. The bellows seal failure of the relief valve resulted in a degradation of the primary containment leakage boundary.

The cause for the bellows seal failure appears to be hydraulic forces on the seal inherent in the design of the HPCS System and the discharge of the relief valve.

The HPCS relief valve was repaired and tested operational under work request L37865. Work was completed by June 16, 1984.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO 3150-0104
EXPIRES 8/31/96

FACILITY NAME (1) LaSalle County Station Unit 2	DOCKET NUMBER (2) 0500937484	LER NUMBER (8)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		03	030	00	02	OF	04

TEXT (if more space is required, use additional NRC Form 385A-1 (17))

I. EVENT DESCRIPTION

At 0215 on June 15, 1984, the High Pressure Core Spray System (BG, HPCS) was declared inoperable. This was a result of leakage being observed from the "weep" hole of the Unit 2 HPCS discharge relief valve, 2E22-F035. Subsequently, it was determined that this leakage was from the internal bellows seal. Since the internal bellows seal also provides a boundary for primary containment integrity, and the amount of the leakage could not be determined, an "Unusual Event" was declared at 1715 on June 15, 1984 and a shutdown initiated. The unit reached hot shutdown at 0100 on June 16, 1984 in accordance with Technical Specification 3.6.1.1. A manual scram was initiated at 0200 to insert the final control rods to complete the shutdown.

II. CAUSE

The cause for the failure of the HPCS discharge relief valve (2E22-F035) internal bellows seal appears to be the result of hydraulic forces being felt downstream on the discharge side of the relief. These hydraulic forces are inherent in the design of the HPCS System and the placement of the relief valve discharge. The relief valve discharges to the suppression pool along with the HPCS minimum flow bypass line and the HPCS return to suppression pool full flow test line. All three lines share a common line to the suppression pool. As a result, hydraulic forces are being felt on the discharge relief internal bellows seal. The internal bellows seal's purpose is to negate the effects of discharge backpressure on the lift setpoint of the discharge relief valve. The internal bellows seal can only withstand approximately 90 psi on the downstream side. When the hydraulic forces exceed this design pressure, the bellows seal fails.

The manual scram to complete the shutdown was required due to a rod block from a bad rod position indicator switch.

III. PROBABLE CONSEQUENCES OF THE OCCURRENCE

The failure of the internal bellows seal does not affect the ability of the High Pressure Core Spray System to perform its design function. The HPCS System was still capable if called upon. The Division I and Division II Emergency Core Cooling System (ECCS) components were fully operable and available. The effect the bellows seal failure had on the HPCS System was to allow leakage of water from the minimum flow bypass line and HPCS return to the suppression pool full flow test line.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO 3180-0104
EXPIRES 8/31/86

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (8)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
LaSalle County Station Unit 2	0500037484	—	030	—	003	OF 04

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

The effect the bellows seal failure had on the plant was to provide a leakage path from the primary containment boundary through the weep hole in the relief valve bonnet. The leak rate through the failed bellows was tested at 0200 on June 16, 1984 at 39.6 psi (Pa) and was determined to be 162.2 SCFH. This value was added to the present containment leakage (previous Type A Test result) of 135.9 SCFH, along with a flowmeter error of 8.7 SCFH. This value (306.8 SCFH) was still determined to be below the maximum allowable primary containment leak rate of 385.7 SCFH (La). Because of this reason, primary containment integrity was maintained.

IV. CORRECTIVE ACTION

Upon discovering the failure of the HPCS discharge relief bellows seal the HPCS System was declared inoperable at 0215 on June 15, 1984.

A Generating Station Emergency Procedure (GSEP) "Unusual Event" was declared at 1715 on June 15, 1984. This was due to the fact that it was not readily apparent that the HPCS relief leakage was actually a primary containment boundary. The Technical Specifications make no reference to this valve.

The unit was subsequently shutdown at 0200 on June 16, 1984 in accordance with Technical Specification 3.6.1.1.

Work Request L37865 was written to repair the relief valve. The bellows seal was replaced and leak tested (no leakage) and the valve was re-installed in the HPCS System at 1500 on June 16, 1984. The relief valve flange was leak rate tested (no leakage) at 1800 on June 16, 1984 to 39.6 psi. The "AS LEFT" primary containment leakage rate remained 135.9 SCFH (0.2237%/day). Work Request L37865 was completed on June 16, 1984 and the HPCS System subsequently returned to service.

Procedure revisions to LaSalle Operating Surveillances LOS-HP-Q1, HPCS System Inservice Test and LOS-HP-R1, HPCS Pump Alternate Flow Path Inservice Test, have been written to minimize the potential for failure of the bellows seals. (AIR 1-84-67107). A proposed change to the Technical Specifications has been written to include HPCS relief valves 1E22-F035 and 2E22-F035 as primary containment boundaries.

While this valve did not appear in Technical Specification Table 3.6.3-1, the subject valve was tested to the leakage limits specified in the Technical Specifications as part of the leakage test for other valves in the HPCS System and as part of the Type A Test.

An investigation of the design of the discharge of this relief valve will be conducted to determine if design changes are required. (AIR 1-84-67108).

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

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LaSalle County Station Unit 2	0500037484	—	030	—00	04	OF	04

TEXT (If more space is required, use additional NRC Form 388A-1 (17))

V. PREVIOUS OCCURRENCES

None

VI. NAME AND TELEPHONE NUMBER OF PREPARER

Vincent Masterson, E.A., 815-357-6761, Extension 499.



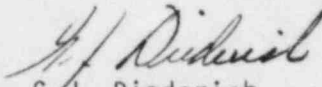
Commonwealth Edison
LaSalle County Nuclear Station
Rural Route #1, Box 220
Marseilles, Illinois 61341
Telephone 815/357-6761

July 9, 1984

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

Dear Sir:

Reportable Occurrence Report #84-030-00, 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/ph

Enclosure

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

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