

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Fort St. Vrain, Unit No. 1										DOCKET NUMBER (2) 0 5 0 0 0 2 6 7 1 OF 0 5										PAGE (3) 5			
TITLE (4) "D" Circulator Trip Following Isolation Of PDT-2178-1																							
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 N/A					DOCKET NUMBER(S) 0 5 0 0 0									
1	0	2	3	8	5	8	5	0	2	3	0	0	1	0	2	2	8	5	0	5	0	0	0
OPERATING MODE (9) N		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)																					
POWER LEVEL (10) 0 1 0 8		20.402(b)				20.405(c)				50.73(a)(2)(iv)				73.71(b)									
		20.405(a)(1)(i)				50.36(c)(1)				X 50.73(a)(2)(v)				73.71(c)									
		20.405(a)(1)(ii)				50.36(c)(2)				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)(ix)													
LICENSEE CONTACT FOR THIS LER (12) NAME Jim Eggebroten, Superintendent, Technical Services Eng.												TELEPHONE NUMBER AREA CODE 3 0 3 7 8 5 - 2 2 2 3											
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																							
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs														
X	J	C	P	D	T	F	1	8	0	Y													
SUPPLEMENTAL REPORT EXPECTED (14) <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO										EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR									
ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)																							

On October 23, 1985, with reactor power at 7.5%, and "B" and "C" circulators operating via steam drive, "D" circulator tripped on high buffer-mid-buffer differential pressure. This single circulator trip occurred while "D" circulator was being provided with buffer helium and bearing water, with its steam and water turbines isolated.

Buffer helium was leaking through "D" circulator main drain pressure differential transmitter (PDT-2178-1). Due to this leak, PDT-2178-1 was being removed for repair. The circulator trip occurred when the root valves for PDT-2178-1 were closed, stopping the buffer helium leak and thereby causing a high pressure differential spike across the buffer-mid-buffer.

Single circulator trips are initiated for equipment protection purposes due to abnormal indications associated with a single circulator. Single actuations of the circulator trip circuitry are not considered to require Nuclear Regulatory Commission notification nor Licensee Event Reporting in accordance with the requirements of 10 CFR 50.72 and 50.73. However, due to recent concerns expressed by the Senior Resident Inspector, the Licensee will voluntarily report actuations of the circulator trip circuitry until this item can be reviewed further with the appropriate Nuclear Regulatory Commission Regional and Washington, D.C. offices.

8512090027 851122  
PDR ADOCK 05000267  
S PDR

IE 22  
1/1

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (8)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Fort St. Vrain, Unit No. 1	0500026785	—	023	—	00	02	OF 05

TEXT (If more space is required, use additional NRC Form 368A's) (17)

EVENT DESCRIPTION:

At the time of the circulator trip action, the reactor was operating at approximately 7.5% power, with "B" and "C" circulators operating via steam drive and circulator auxiliaries (buffer helium and bearing water) being provided to "D" circulator. At 0205 hours on October 23, 1985, "D" circulator tripped on high buffer-mid-buffer differential pressure ( $\Delta P$ ).

On October 22, 1985, "D" circulator buffer-mid-buffer  $\Delta P$  was decreasing below normal levels. The problem was determined to be a buffer helium leak on "D" circulator main drain pressure differential transmitter (PDT-2178-1). In order to compensate for this leak, Control Room Operators adjusted "D" circulator buffer helium supply flow to maximize buffer-mid-buffer  $\Delta P$ .

The five valve manifold (see Figure 1) was leaking through on the gas side and would not isolate PDT-2178-1. Therefore, the root valves were closed in order to isolate the pressure differential transmitter for repair. This effectively stopped the buffer helium leak. Since "D" circulator buffer helium supply flow was above normal level, the circulator tripped on high buffer-mid-buffer  $\Delta P$  when the root valves were closed.

The "D" circulator trip had no effect on the remaining operating circulators nor on plant operation. Pressure differential transmitter leaks are not considered to be a generic or recurring problem. PDT-2178-1 was repaired and returned to service at 1635 hours on October 23, 1985.

Similar circulator trip events were reported in LER 85-014, 85-015, 85-016, and 85-022.

ANALYSIS OF EVENT:

The buffer-mid-buffer sense lines are normally stagnant pressure lines. However, due to a buffer helium leak on PDT-2178-1, "D" circulator buffer-mid-buffer  $\Delta P$  was decreasing on October 22, 1985. Control Room Operators therefore increased "D" circulator buffer helium supply flow to compensate for the leak.

At 0205 on October 23, 1985, "D" circulator tripped on high buffer-mid-buffer  $\Delta P$ . The Reactor Side Equipment Operator was isolating PDT-2178-1 at the time. Closing the root valves effectively stopped the buffer helium leak and, due to higher than normal buffer helium supply flow, caused the pressure in the buffer-mid-buffer sense lines to spike high. This led to the "D" circulator trip actuation.

As each circulator's auxiliary system controls operate independently of the other circulators, this trip had no effect on "B" and "C" circulator operation. The circulator auxiliary systems in each loop were designed with separation and independence so as to preclude a single failure from affecting both forced cooling loops. Also, with the redundancies provided by the four circulators, it is considered incredible in the FSAR design basis that all circulators would become simultaneously inoperable (FSAR Section 14.4.1).

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

FACILITY NAME (1)  Fort St. Vrain, Unit No. 1	DOCKET NUMBER (2)  0 5 0 0 0 2 6 7	LER NUMBER (8)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 5	- 0 2 3	- 0 0	0 3	OF	0 5

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

The Fort St. Vrain Technical Specifications require that one circulator be operable in each loop during power operation, as safe shutdown cooling capability is assured with only one operable circulator. Thus, single actuations of the circulator trip circuitry to shut down a single circulator are considered an equipment protective action, and are specifically stated as such in the Basis of Technical Specification LCO 4.4.1.c. When the reporting requirements of 10 CFR 50.72 and 50.73 were initially proposed, the term Reactor Protection System (RPS) was not recognized nor defined for this plant. Therefore, independent, extensive evaluations were performed considering the Fort St. Vrain licensing basis, industry practice, and Nuclear Regulatory Commission guidance. These evaluations determined that single actuations of the circulator trip circuitry do not require Nuclear Regulatory Commission notification nor Licensee Event Reporting in accordance with the requirements of 10 CFR 50.72 and 50.73.

CAUSE DESCRIPTION:

Buffer helium was leaking through PDT-2178-1. To compensate for this leak, Control Room Operators had increased "D" circulator buffer helium supply flow to maximize buffer-mid-buffer  $\Delta P$ . In order to isolate PDT-2178-1 for repair, the root valves were closed, effectively stopping the buffer helium leak. Since buffer helium supply flow was higher than normal, this resulted in a "D" circulator trip on high buffer-mid-buffer  $\Delta P$ .

CORRECTIVE ACTION:

PDT-2178-1 has been repaired and returned to service. A Station Service Request has also been initiated to repair the five valve manifold of PDT-2178-1. These corrective actions are not considered to be safety significant nor impact public health and safety.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

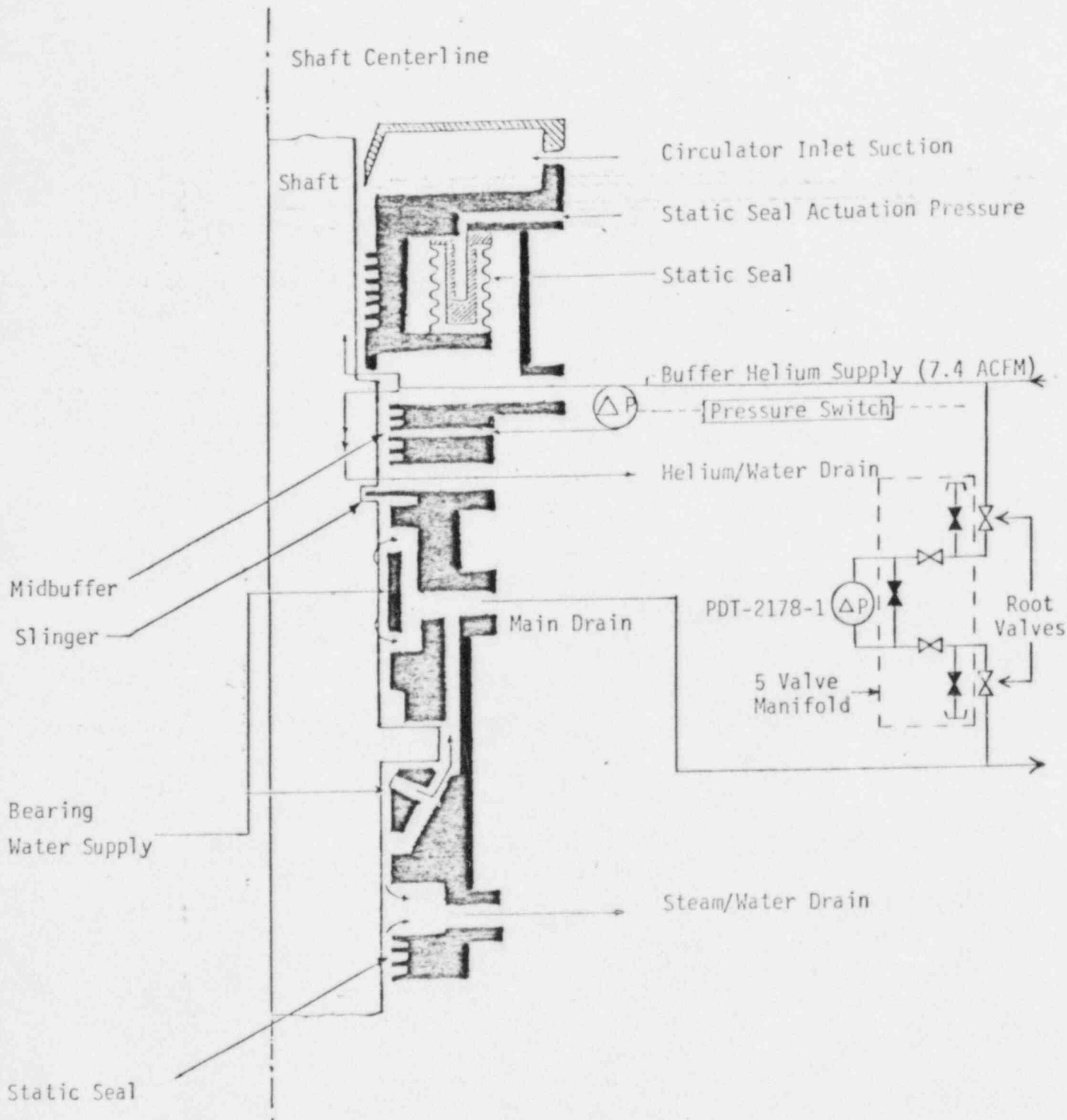
PAGE (3)

Fort St. Vrain, Unit No. 1

0 5 0 0 0 2 6 7 8 5 - 0 2 3 - 0 0 0 4 OF 0 5

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

FIGURE 1.



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)  Fort St. Vrain, Unit No. 1	DOCKET NUMBER (2)  0 5 0 0 0 2 6 7	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 5	— 0 2 3	— 0 0	0 5	OF	0 5

TEXT (If more space is required, use additional NRC Form 368A's) (17)

Jeff S. Castor  
Jeff S. Castor  
Technical Services Technician

Jim Eggebroten  
Jim Eggebroten  
Superintendent, Technical Services Eng.

Licensing Review By: Duane L. Lye

Jim Gramling  
Jim Gramling  
Nuclear Licensing-Operations Supervisor

C. H. Fuller  
C. H. Fuller  
Station Manager

J. W. Gahm  
J. W. Gahm  
Manager, Nuclear Production



**Public Service™**

16805 WCR 19 1/2, Platteville, Colorado 80651

**Public Service  
Company of Colorado**

November 20, 1985  
Fort St. Vrain  
Unit No. 1  
P-85422

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

Docket No. 50-267

SUBJECT: Licensee Event Report  
85-023, Final Report

REFERENCE: Facility Operating  
License No. DPR-34

Gentlemen:

Enclosed please find a copy of Licensee Event Report  
No. 50-267/85-023, Final, submitted per the requirements of  
10 CFR 50.73(a)(2)(v).

Sincerely,

J. W. Gahm  
Manager, Nuclear Production

Enclosure

cc: Regional Administrator, Region IV

Attn.: Mr. E. H. Johnson  
Chief Reactor Projects Branch

cc: Director of Nuclear Reactor Regulation

Attn.: Mr. E. J. Butcher, Jr.  
Acting Chief Operating Reactors Branch No. 3

cc: Director, MIPC

JWG/djm

*1 E22*  
*11*