NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Fort St. Vrain, Unit No. 1	0 5 0 0 0 2 6 7	1 OF 0 5

TITLE (4)
Loop II Shutdown Due To Operator Error

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 1	2 7	8 6	8 6	0 1 0	0 0	0 2	2 6	8 6	N/A	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N		20.402(b)	20.405(c)	XX 50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 0 0	20.405(a)(1)(i)	50.36(c)(1)	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)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Jim Eggebroten, Superintendent, Technical Services Eng.	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 NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
X	C F	S E A L	G 2 0 0	Y							

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On January 27, 1986, at 2034 hours, with the reactor shutdown and "C" helium circulator shutdown, an automatic Loop II Shutdown was initiated by the Plant Protective System (PPS). The Loop II Shutdown occurred as a result of the trip of "D" helium circulator. The trip of "D" helium circulator was due to failure to maintain proper level in the Loop II Bearing Water Surge Tank (T-2105). The Bearing Water Makeup Pump (P-2105) had been cleared out to repair a faulty mechanical seal. Partial makeup to the bearing water surge tanks was via a temporary line installed from the Emergency Condensate header to the discharge side of the Emergency Bearing Water Makeup Pump. Additional makeup was provided by running the Emergency Bearing Water Pump (P-2108) as necessary. Operator distraction to other duties allowed the level in T-2105 to drop to the point where the Loop II bearing water pumps tripped on low surge tank level.

The level in T-2105 was recovered, Loop II bearing water pumps restarted, and "D" helium circulator was returned to operation at 2101 hours on January 27, 1986. The Bearing Water Makeup Pump was repaired and returned to service on February 1, 1986.

The actuation of the PPS for the Loop II Shutdown is reportable under 10CFR50.73(a)(2)(iv).

IE22
1/1

BACKGROUND:

The helium circulator bearing water system supplies approximately 170 gpm of bearing water for bearing lubrication at approximately 1300 psig and 105 degrees Fahrenheit to each operating helium circulator.

Redundant differential pressure switches monitor the differential pressure between the bearing water supply cavity and the main drain of each helium circulator. The differential pressure switch setpoint is approximately 475 psid and provides an input to the PPS to initiate the isolation of the helium circulator and its associated auxiliary systems on the loss of bearing water.

Makeup to the Bearing Water System for normal system losses was being provided by the Bearing Water Makeup Pump (P-2105), which is capable of supplying approximately 170 gpm of condensate to the bearing water surge tanks. The Emergency Bearing Water Makeup Pump (P-2108) is capable of supplying approximately 40 gpm of condensate or firewater to the bearing water surge tanks.

Each bearing water surge tank is provided with a low level switch which will stop its associated bearing water pumps and close the pump suction block valve. This action prevents pump damage through cavitation and also prevents surge tank depressurization in the event the low liquid level is due to a ruptured pump suction or bearing water supply line. The low level switch also actuates a low surge tank level alarm in the control room.

EVENT DESCRIPTION:

The reactor was shutdown with all thirty-seven control rod pairs fully inserted in the core and all control rod drive power supply breakers open.

"A" helium circulator was operating in Loop I on steam turbine drive with steam supplied from the auxiliary boiler system. "B" helium circulator was shutdown with its mechanical brake and seal set.

"D" helium circulator was operating in Loop II on steam turbine drive with steam supplied from the auxiliary boiler system. "C" helium circulator was shutdown with its mechanical brake and seal set.

On January 27, 1986, at approximately 1440 hours, the Bearing Water Makeup Pump was cleared out to repair the mechanical seal. Temporary Configuration Report #860133 was issued to provide bearing water makeup from the Emergency Condensate System via a temporary line installed from the Emergency Condensate header to the discharge line of the Emergency Bearing Water Makeup Pump (Figure 1). Since the sizing of this line was insufficient to provide for the full bearing water makeup requirements, additional makeup was being provided by running the Emergency Bearing Water Makeup Pump approximately every 10 to 15 minutes.

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

On January 27, 1986, at 2034 hours, an automatic Loop II Shutdown was initiated by the PPS as a result of the trip of "D" helium circulator on bearing water cavity low differential pressure.

CAUSE DESCRIPTION:

The trip of "D" helium circulator was due to the loss of both bearing water pumps in Loop II due to low level in the bearing water surge tank. Since "C" helium circulator was already shutdown and its trip signal locked into the PPS, this completed the necessary logic for the Loop II Shutdown actuation.

The cause of this event was operator error. The Reactor Operator was performing other operational duties and did not start the Emergency Bearing Water Makeup Pump in sufficient time to provide the supplemental makeup required. Consequently, the T-2105 level dropped to the low surge tank level, bearing water pump trip setpoint.

SAFETY ANALYSIS:

The trip of "D" helium circulator had no effect on the remaining operating circulator in Loop I, nor on plant operation.

The helium 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 helium circulators, it is considered incredible in the FSAR design basis that all four helium circulators would become simultaneously inoperable (FSAR Section 14.4.1).

The Fort St. Vrain Technical Specifications require that one helium circulator be operable in each loop during power operation, as safe shutdown cooling capability is assured with only one operable helium circulator.

The PPS actuation was conservative and functioned as designed.

CORRECTIVE ACTION:

T-2105 level was recovered, the Loop II bearing water pumps were restarted and "D" helium circulator was returned to operation at 2101 hours on January 27, 1986.

The temporary line installed to provide makeup to the bearing water surge tanks was replaced with a larger diameter line to minimize the need to run the Emergency Bearing Water Makeup Pump on January 29, 1986.

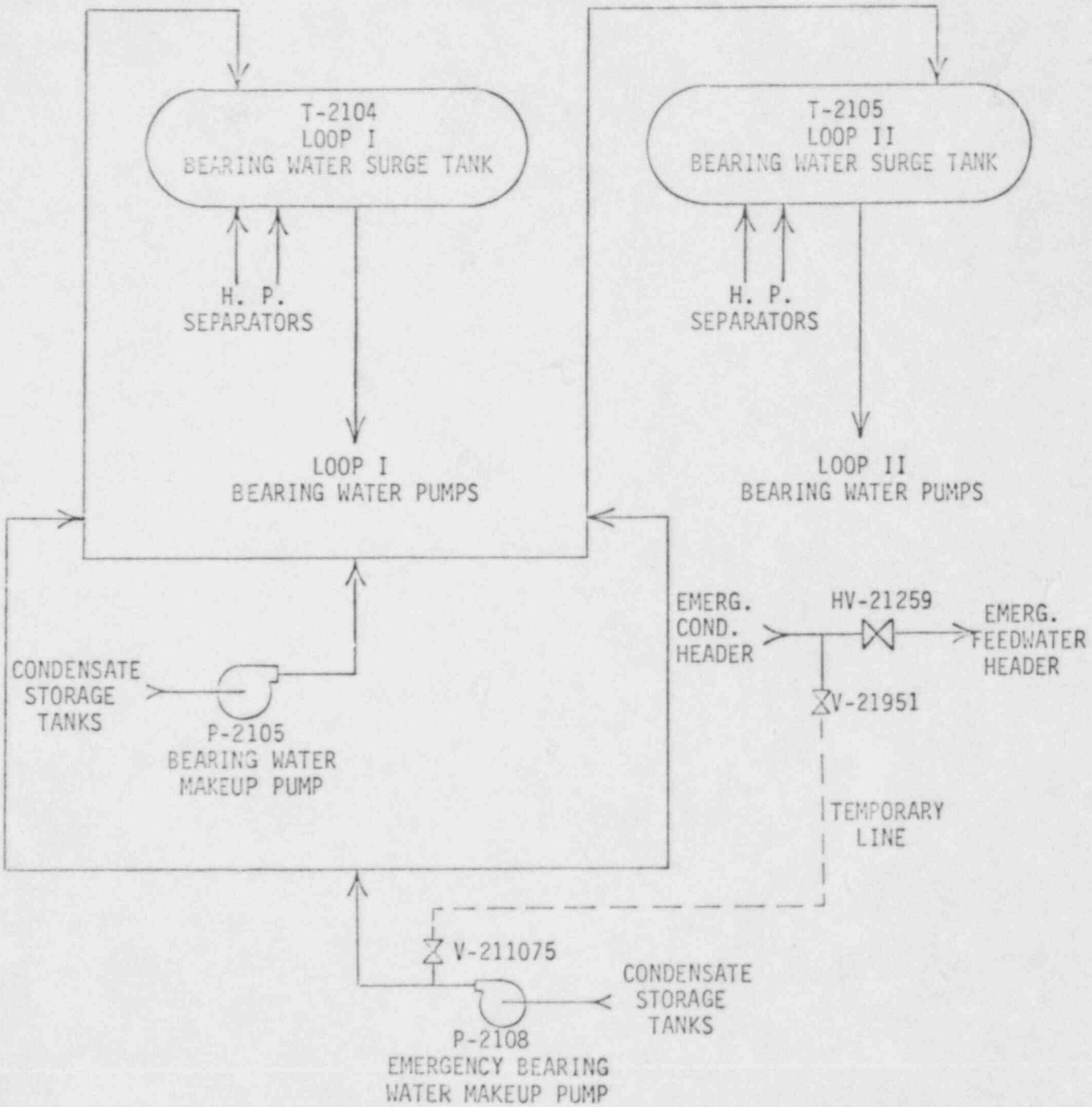
The Bearing Water Makeup Pump was repaired and returned to service on February 1, 1986.

No further corrective action is anticipated or required.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Fort St. Vrain, Unit No. 1	0 5 0 0 0 2 6 7	8 6	— 0 1 0	— 0 1 0	0 4 OF 0 5

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

FIGURE 1



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

Art Stithem
Techical Services Technician

Jim Eggebroten
Supt., Technical Services Engineering

Licensing Review By: Duane L. Frye

Jim Gramling
Nuclear Licensing-Operations Supervisor

C. H. Fuller
Station Manager

J W Gahm by D D Borst
J. W. Gahm
Manager, Nuclear Production

Public Service
16805 WCR 19 1/2, Platteville, Colorado 80651

Public Service
Company of Colorado

February 26, 1986
Fort St. Vrain
Unit No. 1
P-86126

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

Docket No. 50-267

SUBJECT: Licensee Event Report
86-010, Final Report

REFERENCE: Facility Operating
License No. DPR-34

Gentlemen:

Enclosed please find a copy of Licensee Event Report No. 50-267/86-010, Final, submitted per the requirements of 10 CFR 50.73(a)(2)(iv).

Sincerely,

JW Gahm by DJBeirst

J. W. Gahm
Manager, Nuclear Production

Enclosure

cc: Regional Administrator, Region IV
Attn.: Mr. J. E. Gagliardo, Chief
Reactor Projects Branch

cc: Director of Nuclear Reactor Regulation
Attn.: Mr. W. N. Berkow, Project Director
Standardization and Special
Projects Directorate

cc: Director, MIPC

JWG/djm

IE22
1/1