

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					PAGE (3) 1 OF 015							
TITLE (4) Loss Of 480V Bus 1 - Loop 1 Shutdown																						
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 NAME N/A				DOCKET NUMBER(S) 0 5 0 0 0									
0	5	2	9	8	4	8	4	0	0	7	0	0	0	6	2	8	4	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 0 2		20.402(b)				20.408(a)				<input checked="" type="checkbox"/> 50.73(a)(2)(iv)				73.71(b)								
		20.408(a)(1)(i)				50.36(a)(1)				50.73(a)(2)(vi)				73.71(a)								
		20.408(a)(1)(ii)				50.36(a)(2)				50.73(a)(2)(vii)				OTHER (Specify in Abstract below and in Text, NRC Form 305A)								
		20.408(a)(1)(iii)				50.73(a)(2)(ii)				50.73(a)(2)(viii)(A)												
		20.408(a)(1)(iv)				50.73(a)(2)(iii)				50.73(a)(2)(viii)(B)												
		20.408(a)(1)(v)				50.73(a)(2)(iv)				50.73(a)(2)(ix)												
LICENSEE CONTACT FOR THIS LER (12)																						
NAME Frank Novachek, Technical Services Engineering Supervisor										TELEPHONE NUMBER 7 1 8 5 1 - 1 2 1 2 1 4												
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												
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)

On May 29, 1984, at approximately 1135 hours, with the reactor operating at less than 2% power, a Loop I shutdown occurred when the rapid rise relay (RRR-1) on the 4160/480 volt transformer (N-9274) actuated. This actuation resulted in a trip of the 4160/480 volt transformer, supplying the 480V A.C. Essential Bus 1A, and a Loop I shutdown, due to the trip of both helium circulators (C-2101, C-2102) and the associated auxiliaries in that loop, when a loss of circulator bearing water was detected by the helium circulator's bearing water pressure differential indicating switches.

No apparent malfunction in the rapid rise relay was detected when inspected by plant electrical personnel. The transformer was thoroughly checked and samples of the transformer oil and nitrogen blanket were taken and tested. The transformer (N-9274) was pre-warmed and returned to service at 1100 hours on May 30, 1984. At 2205 hours on May 30, 1984, Loop I was returned to service.

The automatic actuation of the Plant Protective System (PPS) circuitry for a loop shutdown is being reported per 10 CFR 50.73(a)(2)(iv).

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

EVENT DESCRIPTION:

The Fort St. Vrain helium primary coolant system is equipped with four identical helium circulators, two in each loop. The helium circulators are supplied with high pressure water sources for bearing lubrication from the bearing water system which consists of two separate and independent recirculating bearing water loops with three bearing water pumps in each loop piped for operation in series. The bearing water supply system is monitored by three pressure differential indicating switches (PDIS) per helium circulator which monitor the pressure differential between the bearing water supply cavity and the main drain system.

The Loop I shutdown was initiated when a loss of circulator bearing water was detected by instrumentation in the Plant Protective System (PPS).

The sequence of events leading to the Loop 1 shutdown on May 29, 1984 were as follows:

1. The rapid rise relay (RRR-1) on the auxiliary transformer 4160/480V A.C. (N-9274) tripped.
2. The fire water (System 45) deluge at the auxiliary transformers was activated.
3. The lock out relay in the 480V A.C. Essential Bus 1A cabinet energized, causing the essential Bus 1A main breaker and the 4160V feed breaker to the auxiliary transformer (N-9274) to trip open.
4. The essential 480V A.C. bus tie 2 from Bus 1B to 480V A.C. Essential Bus 1A breaker closed automatically to energize Bus 1.

The momentary loss of electrical motive power to the in-service bearing water pumps initiated trip inputs to the Plant Protective System when a pressure differential of less than 475 PSID was detected by the helium circulators pressure differential indicating switches with the resultant Loop I shutdown.

ANALYSIS OF EVENT:

The Plant Protective System (PPS) consists of instrumentation and controls required to automatically initiate safety actions to protect the reactor core and various plant components important to maintaining core cooling. The basic logic system employs a 2 of 3 redundancy for the sensing channels. The tripped bearing water pumps were unable to satisfy the trip setting of equal to or greater than 475 PSID. The switches acted to trip the circulators on sensing a pressure differential of less than 475 PSID, indicating a loss of bearing water flow and initiating sufficient PPS inputs to trip the helium circulators C-2101 and C-2102 and the shutdown of Loop I.

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

Referring to Figure 1, as the pressure differential between the water supply cavity and the main drain decreases, the pressure differential switches (PDIS) [1] will individually close at their respective setpoints. This applies a voltage to the switch input modules (XDIS) [2], tripping them. Each tripped XDIS module transmits a signal to both "A" and "B" logic channels [3]. When either "A" or "B" logic receives inputs from any two of the three XDIS modules, they will transmit a signal to the "A" or "B" logic OR gate [4] respectively. The OR gates transmit any input signal to the respective special control relay (XCR) [5] to energize auxiliary relays which trip the helium circulator and initiate the following helium circulator protective actions:

1. Isolation of the steam and water turbine supply and return lines.
2. Fire the bearing water accumulator system, which initiates a surge of bearing water, to allow coastdown of the circulator.
3. Apply the brake when speed has decreased below 700 RPM.
4. Apply the mechanical shutdown seal.
5. Isolate the remaining circulator auxiliaries.

This event had no potential effect on the health and safety of the public.

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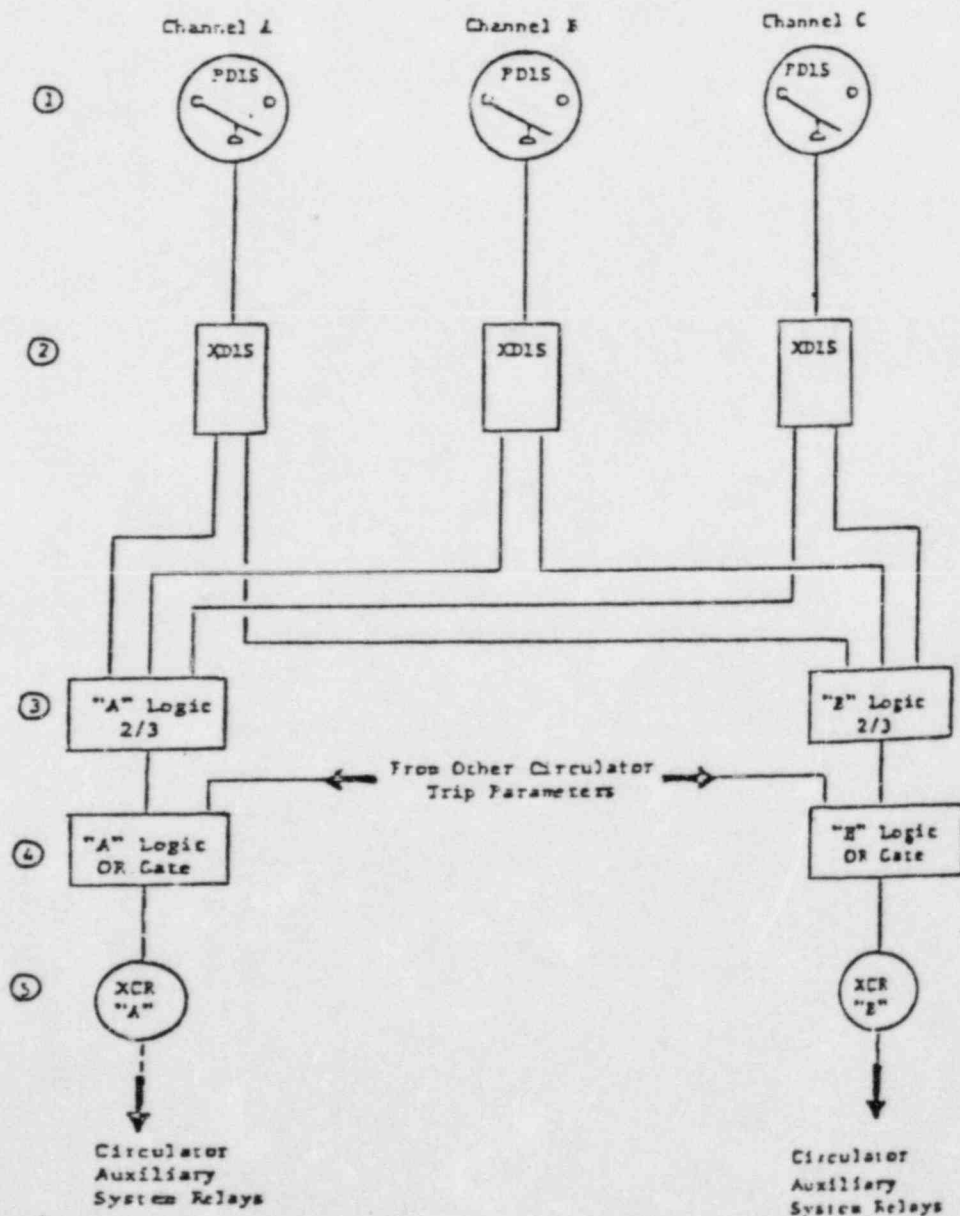
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		8 4	0 0 7	0 0 0	4	OF 0 5

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

FIGURE 1

TYPICAL FOR EACH CIRCULATOR



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

CAUSE DESCRIPTION:

The rapid rise relay (RRR-1) on the 4160/480V A.C. transformer (N-9274) was inspected immediately following this event by plant electrical personnel who could find no apparent malfunction in the relay or circuitry.

The cause of this event has been attributed to the spurious actuation of the rapid rise relay (RRR-1) contact circuitry.

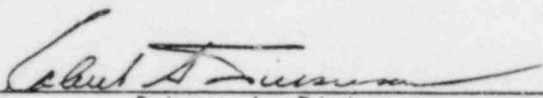
CORRECTIVE ACTION:

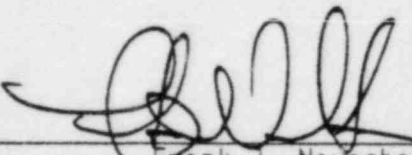
The oil in the transformer (N-9274) was sampled and tested. A sample of the gaseous nitrogen blanket was also tested with negative results.

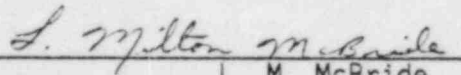
The transformer was thoroughly checked and pre-warmed prior to returning to service at 1100 hours on May 30, 1984.

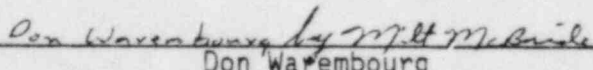
The Loop I steam generator was returned to service on May 30, 1984, at 2205 hours.

No further corrective action is anticipated or required.


Robert A. Dickerson
Technical Services Senior Technician


Frank J. Novachek
Technical Services Engineering Supervisor


L. M. McBride
Station Manager


Don Warembourg
Manager, Nuclear Production



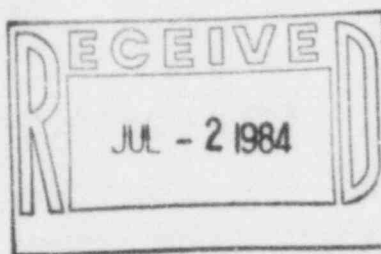
Public Service Company ^{of} Colorado

16805 WCR 19 1/2, Platteville, Colorado 80651

50-267

June 28, 1984
Fort St. Vrain
Unit #1
P-84190

Mr. E. H. Johnson, Chief
Reactor Project Branch 1
Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Drive
Suite 1000
Arlington, TX 76011



REFERENCE: Facility Operating License
No. DPR-34

Docket No. 50-267

Dear Mr. Johnson:

Enclosed please find a copy of Licensee Event Report
No. 50-267/84-007, Final, submitted per the requirements of
10 CFR 50.73(a)(2)(iv).

Very truly yours,

Don Warembourg by Milt McBride

Don Warembourg
Manager, Nuclear Production

DWW/djm

Enclosure

cc: Director, MIPC

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