

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)  
Fort St. Vrain, Unit No. 1DOCKET NUMBER (2)  
0 5 0 0 0 2 6 1 7  
PAGE (3)  
1 OF 0 1 7TITLE (4)  
Loop I Automatic Shutdown Initiated By Plant Protective SystemEVENT DATE (5)  
MONTH DAY YEAR  
0 6 0 3 8 5  
LER NUMBER (6)  
YEAR SEQUENTIAL NUMBER REVISION NUMBER  
8 5 - 0 0 9 - 0 0 0  
REPORT DATE (7)  
MONTH DAY YEAR  
0 7 0 3 8 5  
OTHER FACILITIES INVOLVED (8)  
FACILITY NAMES  
N/A  
DOCKET NUMBER(S)  
0 5 0 0 0THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)  
OPERATING MODE (9)  
N  
POWER LEVEL (10)  
0 1 0 0  
20.402(b)  
20.406(a)(1)(i)  
20.406(a)(1)(ii)  
20.406(a)(1)(iii)  
20.406(a)(1)(iv)  
20.406(a)(1)(v)  
20.406(a)  
50.38(a)(1)  
50.38(a)(2)  
50.73(a)(2)(i)  
50.73(a)(2)(ii)  
50.73(a)(2)(iii)  
50.73(a)(2)(iv)  
50.73(a)(2)(v)  
50.73(a)(2)(vi)  
50.73(a)(2)(vii)(A)  
50.73(a)(2)(vii)(B)  
50.73(a)(2)(x)  
73.71(b)  
73.71(c)  
OTHER (Specify in Abstract below and in Text, NRC Form 365A)LICENSEE CONTACT FOR THIS LER (12)  
NAME  
Jim Eggebroten, Technical Services Engineering Supervisor  
TELEPHONE NUMBER  
3 0 3 7 8 5 - 1 2 2 2 3  
AREA CODECOMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)  
CAUSE SYSTEM COMPONENT MANUFACTURER REPORTABLE TO NRC  
CAUSE SYSTEM COMPONENT MANUFACTURER REPORTABLE TO NRCSUPPLEMENTAL REPORT EXPECTED (14)  
X YES (If yes, complete EXPECTED SUBMISSION DATE)  
NO  
EXPECTED SUBMISSION DATE (15)  
MONTH DAY YEAR  
1 0 0 3 8 5

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

An automatic Loop 1 shutdown was initiated by the plant protective system (PPS) at approximately 1247 hours on June 3, 1985. Since Loop 2 was already in the shutdown state at the time of the Loop 1 shutdown, a short term Loss Of Forced Circulation (LOFC) occurred. The reactor was shut down and depressurized, with decay heat being removed by "B" helium circulator and Loop 1 steam generator operating on condensate. The core temperature rise during the LOFC was small since the reactor had been shut down for an extended period for maintenance, and did not approach any safety limits. Initial investigations revealed specific component failures that have since been corrected. Further investigations are presently being conducted to ensure that normal protective actions are operational.

This event does not represent an unanalyzed condition since it is bounded by an FSAR evaluation including total loss of forced cooling for 1 1/2 hours from 100% power. This event is being reported under 10 CFR 50.73(a)(2)(iv) as an automatic actuation of the Reactor Protection System.

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PDR ADOCK 05000267  
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## 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 8 5	LER NUMBER (8)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 5	— 0 0 9	— 0 0	0 2	OF 0 7

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

EVENT DESCRIPTION:

A Loop 1 automatic shutdown was initiated by the plant protective system (PPS) on June 3, 1985 at approximately 1247 hours. At the time the shutdown occurred, the reactor had been shut down since June 23, 1984, and was depressurized, with decay heat being removed by "B" helium circulator and Loop 1 steam generator operating on condensate. Loop 2 was already shut down and dumped, the Region 1 control rod drive assembly was out of the core for maintenance, and work was in progress to start "C" circulator in Loop 2 for testing purposes. The resulting Loss of Forced Circulation (LOFC) and two loop shutdown lasted until condensate flow to the Loop 1 steam generators and "B" circulator operations were restored at approximately 1403 hours. The core temperature rise was small since the reactor has been shut down for an extended period and the decay heat generation was very low. The average core temperature during an LOFC is administratively controlled by the design maximum continuous core inlet temperature and by the thermal stresses on the bimetallic weld in the steam generator tubes when secondary cooling is restarted. The administrative steam generator limit requires that secondary flow be restarted first if the steam generator tubes are greater than 400°F. Based on this limit, an LOFC of over 209 hours would have been acceptable. The core inlet temperature limit of 760°F allowed over 560 hours of LOFC at the time of this event. These are both much greater than the 73 minutes LOFC experienced.

ANALYSIS OF EVENT:

With the reactor shut down and depressurized and decay heat removal by Loop 1, an automatic shutdown of core cooling was initiated in Loop 1 by the PPS at approximately 1247 hours on June 3, 1985. The PPS system should have inhibited the automatic shutdown through the first-in-with lockout circuit since Loop 2 was already shut down (see Figure 1 through 3 for loop shutdown circuit logic). Post shutdown analysis of the event sequence recorded by the data logger showed no event which should have shut down the operating loop with Loop 2 already shutdown. Upon investigation, it was found that control relay XCR-93161A, in control room instrument panel I-10 (the PPS panel), was tripped. This is on the Loop 1 shutdown side of the output of the first-in-with-lockout circuit whose inputs are Loop 1 trouble and Loop 2 trouble.

It was also found that the Loop 2 program logic DC power supply had a blown fuse. This fuse has been replaced. Subsequent testing showed that this failure could not have initiated the Loop 1 shutdown by itself.

Further testing however, showed that two intermodular connections between the two-loop trouble (TLT) logic modules TLT-1A and TLT-1B were shorted. Since these connections are responsible for maintaining the first-in-with-lockout function, this short is the probable cause of the Loop 1 shutdown not being inhibited. This connection was repaired and further testing was conducted in attempts to duplicate the June 3, 1985 event. The event could not be duplicated.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO 3150-0104

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FACILITY NAME (1)  Fort St. Vrain, Unit No. 1	DOCKET NUMBER (2)  0 5 0 0 0 2 6 7 8 5	LER NUMBER (8)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8 5	— 0 0 9	— 0 0	0 3	OF	0 7

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

This event does not represent an unanalyzed condition since it is bounded by the scenario considered in the FSAR Section 14.4.2.2. In that case, it was assumed there was a 1.5 hour loss of all core cooling from 100% power operation, followed by cooling with one circulator driven by boosted firewater. The analyses found that no safety limits are exceeded, and no offsite consequences are postulated.

CAUSE DESCRIPTION:

The probable cause of the Loop 1 shutdown not being inhibited was a short in two intermodular connections between TLT logic modules A and B (Figure 3), which cleared the lockout signal from Loop 2.

CORRECTIVE ACTION:

The blown DC power supply fuse has been replaced and the intermodular connections have been repaired.

Functional testing was conducted in attempts to duplicate the June 3, 1985 event. The event could not be duplicated. Additional testing is being conducted to further verify system operation.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

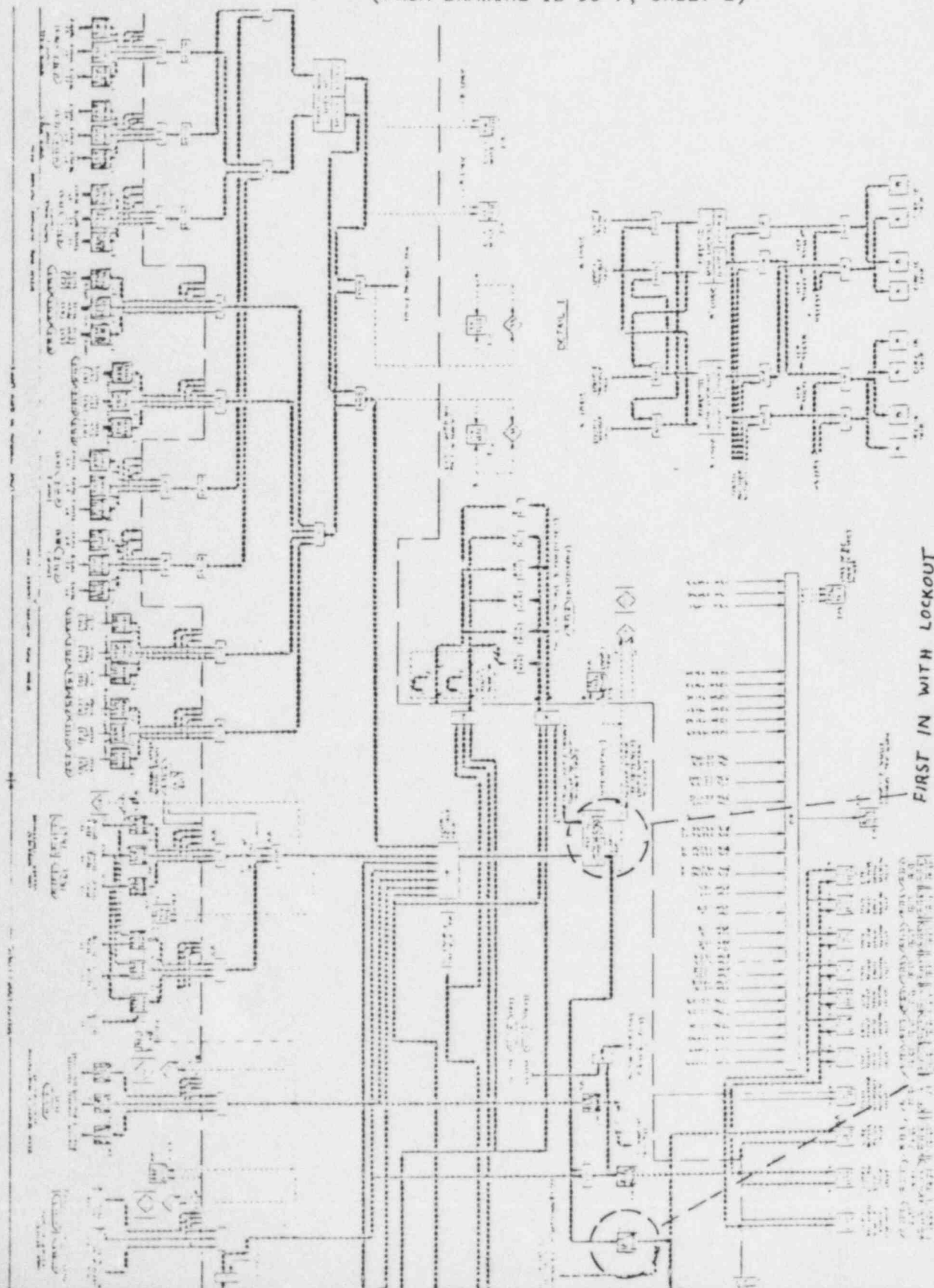
APPROVED OMB NO 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1)  Fort St. Vrain, Unit No. 1	DOCKET NUMBER (2)  05000267815-009-010014 OF 017	LER NUMBER (6)			PAGE (3)  014 OF 017
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	

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

FIGURE 1 LOOP SHUTDOWN LOGIC DIAGRAM  
(FROM DRAWING IB 93-7, SHEET 2)



FIRST IN WITH LOCKOUT

XCR-93/1A



LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO 3150-0104  
EXPIRES 8/31/95

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)  0 5 OF 0 7
		YEAR 8 5	SEQUENTIAL NUMBER 0 0 9	REVISION NUMBER 0 0	

TEXT (If more space is required, use additional NRC Form 365A 2) (17)

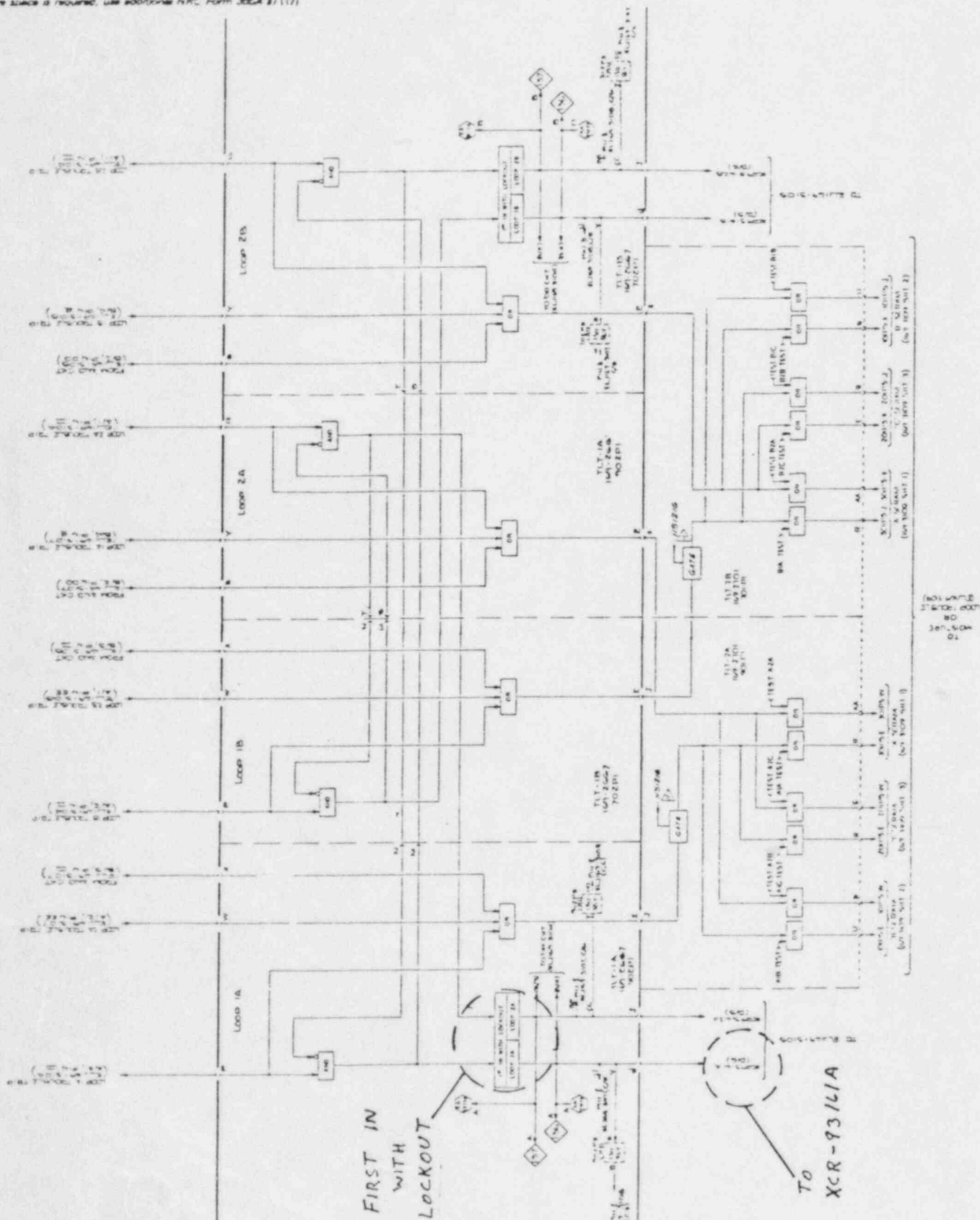


FIGURE 2  
LOOP SHUTDOWN LOGIC (DRAWING ELJ169-3104 SHEET 2)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMR NO 3150-0104  
EXPIRES 8/31/85

FACILITY NAME (3)

DOCKET NUMBER (2)

LER NUMBER (8)

PAGE (3)

Fort St. Vrain, Unit No. 1

0 5 0 0 0 2 6 7 8 5 - 0 0 9 - 0 0 0 6 OF 0 7

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

DETAIL I

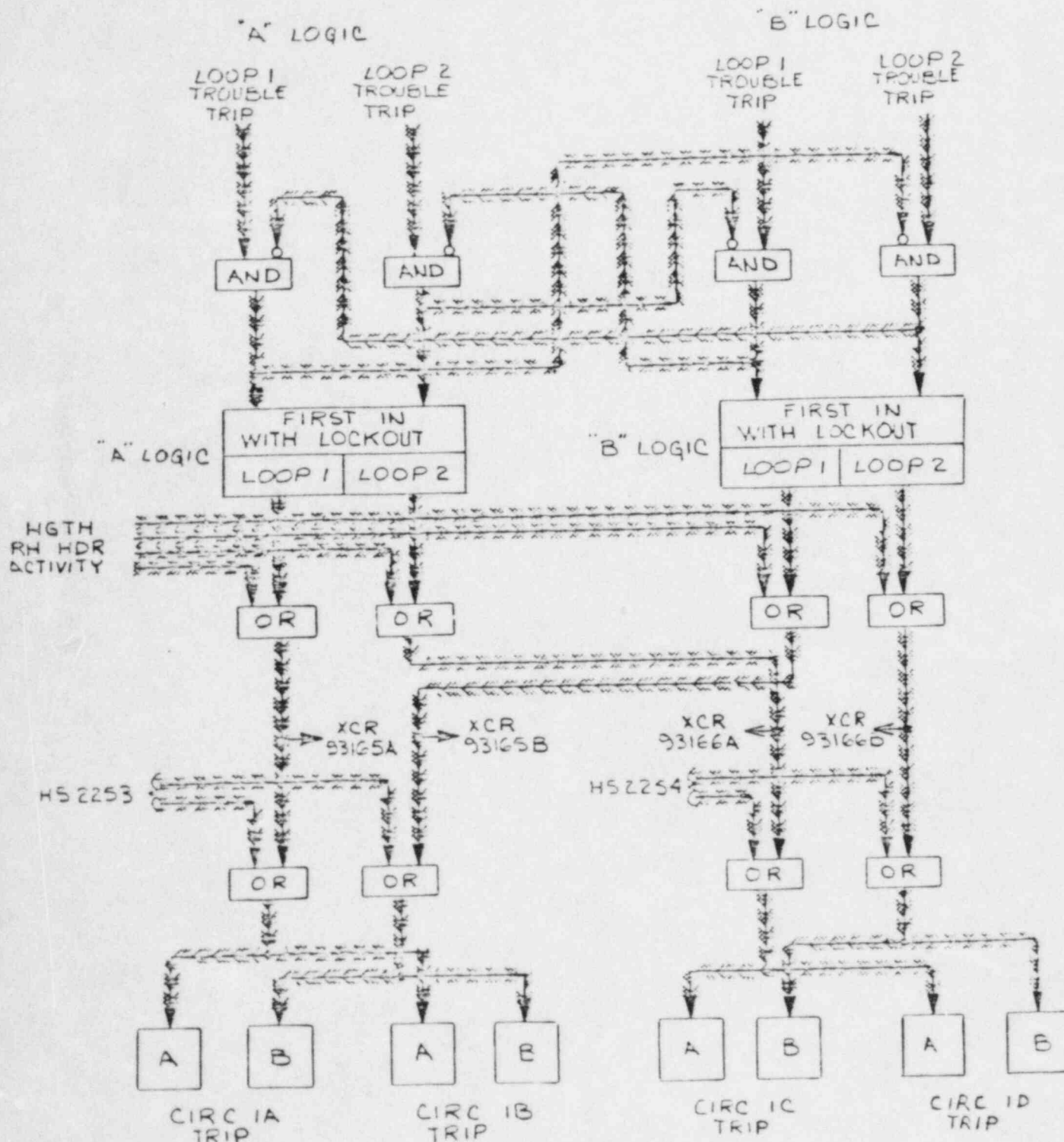


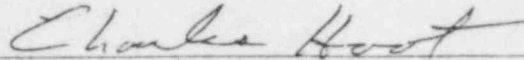
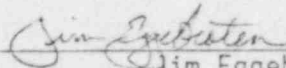
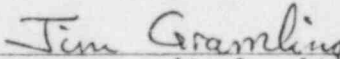
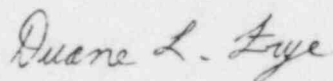
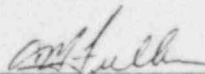
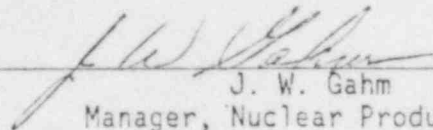
FIGURE 3

ADDITIONAL DETAIL OF  
FIRST-IN-WITH-LOCKOUT A AND B LOGIC

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FACILITY NAME (1)  Fort St. Vrain, Unit No. 1	DOCKET NUMBER (2)  0 5 0 0 0 2 6 7 8 5	LER NUMBER (8)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		—	0 0 9	— 0 1 0	0 7	OF	0 7

TEXT (If more space is required, use additional NRC Form 385A's) (17)

Charles Hoot  
ConsultantJim Eggebroten  
Technical Services Engineering SupervisorLicensing Review By: Jim Gramling  
Nuclear Licensing-Operations SupervisorC. H. Fuller  
Station ManagerJ. W. Gahm  
Manager, Nuclear Production



# Public Service

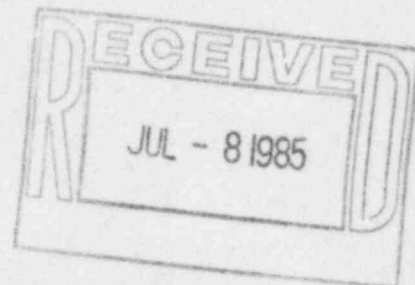
16805 WCR 19 1/2, Platteville, Colorado 80651

Public Service  
Company of Colorado

July 3, 1985  
Fort St. Vrain  
Unit No. 1  
P-85232

Regional Administrator  
Region IV  
U. S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 1000  
Arlington, TX 76011

Attn: Mr. E. H. Johnson



Docket No. 50-267

SUBJECT: Licensee Event Report  
85-009, Preliminary  
Report

REFERENCE: Facility Operating  
License No. DPR-34

Dear Mr. Johnson:

Enclosed please find a copy of Licensee Event Report  
No. 50-267/85-009, Preliminary, submitted per the requirements of  
10 CFR 50.73(a)(2)(iv).

Sincerely,

J. W. Gahm  
Manager, Nuclear Production

Enclosure

cc: Director, MIPC

JWG/djm

85-555

11/1  
11/1  
RETURN original  
TO RIV