NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

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 6

TITLE (4) Startup Channel High Count Rate Scram - LCO 4.4.1

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	DOCKET NUMBER(S)
0 2	1 2	8 4	8 4	0 0 3	0 0	0 3	1 3	8 4	N/A	0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(a)	X 50.73(a)(2)(iv)	73.71(b)
		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
Frank Novachek, Technical Services Engineering Supervisor	AREA CODE 3 0 3 7 8 5 - 1 2 2 2 4

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	

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On February 12, 1984, with the reactor shutdown and routine refueling activities taking place, an automatic Plant Protective System (PPS) reactor scram was initiated by a one of two logic trip involving the Nuclear Startup Channel II (SUC II). The reactor scram resulted during insertion of a fuel block containing the neutron startup source ("source block") into the Region 22 refueling penetration.

The automatic actuation of the PPS scram circuitry is being reported per 10 CFR 50.73(a)(2)(iv).

The startup source fuel block was withdrawn from the reactor core, and refueling activities were temporarily halted until an evaluation of the event was completed.

Additional data was taken as the startup source fuel block was re-inserted into the reactor core via the Region 22 refueling penetration.

EVENT DESCRIPTION:

The nuclear instrumentation system for the Fort St. Vrain reactor core consists of, among other detectors, two neutron detectors located in separate horizontal wells which extend inward to a position above the reactor and radially inside the projection of the core/reflector interface. The detectors are located near the Prestressed Concrete Reactor Vessel liner, but the wells do not penetrate the liner. The two neutron detectors are used during fuel loading, preoperational testing, and other low power operations. During fuel loading operations, a reactor scram is initiated via a one of two logic trip, when either SUC I or SUC II indicates a neutron countrate of 1.0E+5 counts per second or more.

Referring to Figure 1, the SUC II detector is located in close proximity (approximately 19 inches) to the center line of the Region 22 refueling penetration. Region 22 was being loaded with new fuel at the time of the event. The SUC I detector is located approximately 190 inches from the center line of the Region 22 refueling penetration.

Referring to Figure 2, as the fuel block containing the neutron startup source (1.1E+9 neutrons/sec.) was lowered through the Region 22 refueling penetration, the countrate increased to the instrument setpoint of the SUC II detector and initiated the PPS reactor scram at 0911 hours on February 12, 1984. The scram occurred at a source block Z position (i.e. vertical distance into the refueling penetration from above) of approximately 390 inches with the maximum countrate noted as the source block exited the bottom of the refueling penetration at a Z position of approximately 405 inches (i.e. closest proximity to the SUC II detector).

As a conservative measure, the startup source fuel block was withdrawn from the reactor core while an evaluation of the situation was performed, by the Reactor Engineer.

Routine refueling activities were resumed at 1220 hours, as the startup source fuel block was re-inserted into the reactor core.

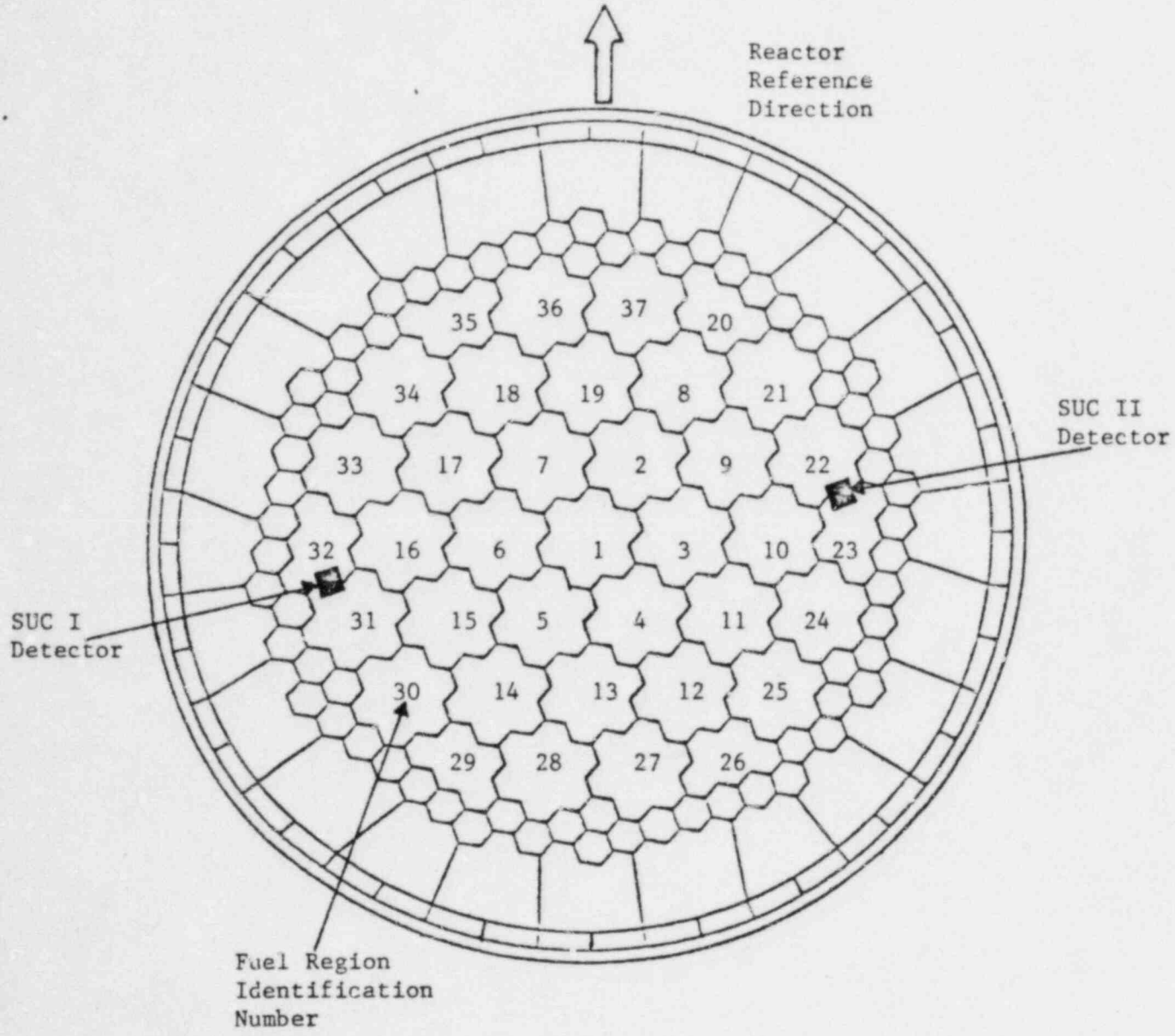
Reactor
Reference
Direction
SUC II
Detector
SUC I
Detector
Fuel Region
Identification
Number
35
36
37
20
34
18
19
8
21
33
17
7
2
9
22
32
16
6
1
3
10
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FIGURE 1

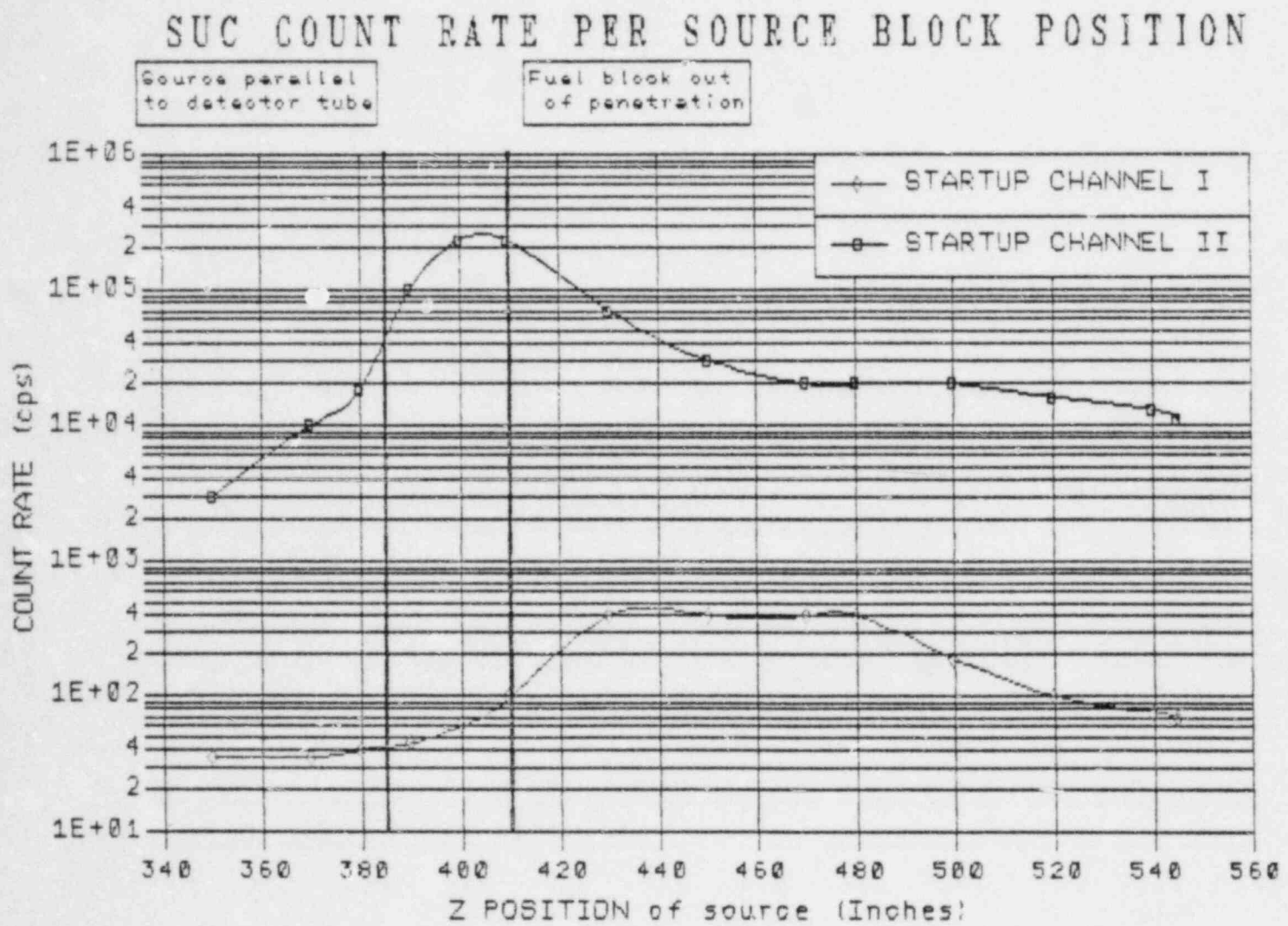
SUC COUNT RATE PER SOURCE BLOCK POSITION
Source parallel to detector tube
Fuel block out of penetration
STARTUP CHANNEL I
STARTUP CHANNEL II
COUNT RATE (cps)
1E+06
4
2
1E+05
4
2
1E+04
4
2
1E+03
4
2
1E+02
4
2
1E+01
340
360
380
400
420
440
460
480
500
520
540
560
Z POSITION of source (Inches)

FIGURE 2

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 4	— 0 0 3	— 0 0	0 5 OF 0 6

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

ANALYSIS OF EVENT:

Since the reactor was shutdown and depressurized for refueling and scheduled maintenance, 35 of 37 control rod pairs were fully inserted. The remaining two control rod pairs were removed from the reactor core to accommodate refueling activities. The actuation of the PPS scram circuitry de-energized the control rod brakes, as designed, thereby ensuring that all of the remaining 35 control rod pairs were fully inserted and, hence, that an adequate shutdown margin was maintained.

Although the automatic actuation of the PPS scram circuitry was not a result of a change in core reactivity, the PPS action was conservative and functioned as designed. An increased countrate was expected during startup source fuel block loading but by strict interpretation of 10 CFR 50.73(a)(2)(iv), cannot be considered to have been a part of the documented preplanned sequence of events.

There was no potential effect on the health and safety of the public.

CAUSE DESCRIPTION

Other.

The increased SUC II countrate and subsequent automatic actuation of the PPS reactor scram circuitry was the direct result of the introduction of the neutron startup source fuel block into close proximity with the neutron detector, while it was being placed into the reactor core.

CORRECTIVE ACTION

The neutron startup source fuel block was removed from the reactor core and refueling activities were temporarily halted.

The Reactor Engineer performed an evaluation of the event to verify that actual criticality was not being achieved.

The startup source fuel block was reloaded into the reactor core.

No further corrective action is anticipated or required.

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

Duane L. Frye
Duane L. Frye
Techical Services Senior Technician

Frank J. Novachek
Technical Services Engineering Supervisor

L. Milton McBride
L. M. McBride
Station Manager

Don Warembourg
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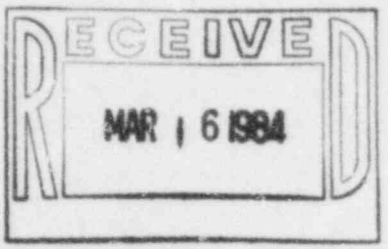
50-267



March 13, 1984
Fort St. Vrain
Unit #1
P-84081

Mr. John T. Collins, Regional Administrator
Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76011

REFERENCE: Facility Operating License
No. DPR-34

Docket No. 50-267

Dear Mr. Collins:

Enclosed please find a copy of Licensee Event Report No. 50-267/84-003, Final, submitted per the requirements of 10 CFR 50.73(a)(2)(iv).

Very truly yours,

Don Warembourg
Manager, Nuclear Production

DWW/djm

Enclosure

cc: Director, MIPC

H005
1/1