

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)
Fort St. Vrain, Unit No. 1

DOCKET NUMBER (2)

0 5 0 0 0 2 6 1 7 1 OF 0 4

PAGE (3)

TITLE (4)
REACTOR SCRAM ACTUATION ON NEUTRON FLUX RATE OF CHANGE HIGH

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	1	8	8	8	8	8	N/A		0 5 0 0 0
0	2	1	1	8	8	8	8	8			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	<table border="1"><thead><tr><th>20.402(b)</th><th>20.405(c)</th><th>50.73(a)(2)(iv)</th><th>73.71(b)</th></tr></thead><tbody><tr><td>20.405(a)(1)(i)</td><td>50.38(e)(1)</td><td>50.73(a)(2)(v)</td><td>73.71(e)</td></tr><tr><td>20.405(a)(1)(ii)</td><td>50.38(e)(2)</td><td>50.73(a)(2)(vi)</td><td>OTHER (Specify in Abstract below and in Text, NRC Form 366A)</td></tr><tr><td>20.405(a)(1)(iii)</td><td>50.73(a)(2)(ii)</td><td>50.73(a)(2)(vii)(A)</td><td></td></tr><tr><td>20.405(a)(1)(iv)</td><td>50.73(a)(2)(iii)</td><td>50.73(a)(2)(vii)(B)</td><td></td></tr><tr><td>20.405(a)(1)(v)</td><td>50.73(a)(2)(iii)</td><td>50.73(a)(2)(ix)</td><td></td></tr></tbody></table>										20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)	20.405(a)(1)(i)	50.38(e)(1)	50.73(a)(2)(v)	73.71(e)	20.405(a)(1)(ii)	50.38(e)(2)	50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)	20.405(a)(1)(iii)	50.73(a)(2)(ii)	50.73(a)(2)(vii)(A)		20.405(a)(1)(iv)	50.73(a)(2)(iii)	50.73(a)(2)(vii)(B)		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)	
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20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)																																

LICENSEE CONTACT FOR THIS LER (12)
NAME
Mark A. Joseph, Technical Services Supervisor

TELEPHONE NUMBER

AREA CODE

3 0 3 6 2 0 - 1 2 0 3

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

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

At 0936 hours on February 11, 1988, with the reactor shutdown following a manual scram on February 10, 1988 (see LER 88-002), the Plant Protective System (PPS) reactor scram logic and alarm circuitry was actuated on Wide Range Channel (WRC) neutron flux rate of change high. Since all control rod pairs were already fully inserted in the core, no control rod movement occurred as a result of this actuation. This event is being reported per the requirements of 10CFR50.73(a)(2)(iv).

The cause of this scram actuation was electrical noise induction in the wide range nuclear instrumentation channels. The source of electrical noise was not specifically identified.

Public Service Company has actively pursued the identification and suppression of noise sources within the plant electrical system. Investigations of past noise related actuations of the PPS have resulted in the completion of several successful corrective actions which have greatly reduced, but not eliminated, noise interference problems within PPS instruments. PSC will continue to suppress or correct problem noise sources as they are identified. In addition, a Change Notice (CN-2762) is being developed to replace or modify the existing WRC cables in an attempt to reduce the effects of electrical noise induction in the WRC instrumentation.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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

EVENT DESCRIPTION:

At 0936 hours on February 11, 1988, with the reactor shutdown following a manual scram on February 10, 1988 (see LER 88-002), the Plant Protective System (PPS) reactor scram logic and alarm circuitry was actuated on Wide Range Channel (WRC) neutron flux rate of change high. The spurious actuation was immediately attributed to electrical noise in the wide range channels. No rod movement occurred as a result of this scram actuation, since all control rod pairs had already been inserted on manual scram the previous day.

CAUSE DESCRIPTION:

The pulse sensing design of the wide range channels, in combination with the low core count rate during shutdown conditions, makes the WRC neutron flux rate of change scram function susceptible to induced electrical noise during reactor shutdown conditions. During reactor operation (i.e., Reactor Mode Switch (RMS) in the "RUN" position) between 0% and 5% power, increased core count rate negates the impact of noise disturbances within the wide range channels, and reactor scram actuations due to plant noise are extremely unlikely to occur. At approximately 5% power, the Interlock Sequence Switch (ISS) is taken from "STARTUP" to "LOW POWER" position, and the WRC neutron flux rate of change scram function is disarmed. Since the wide range channels sense electrical pulses and are unable to distinguish between a valid signal pulse and a noise pulse, they responded on February 11, 1988, to noise pulses and automatically actuated the PPS reactor scram logic and alarm circuitry.

ANALYSIS:

Since this actuation of the PPS reactor scram logic and alarm circuitry was not part of a pre-planned sequence, it is reportable pursuant to the requirements of 10CFR50.72(b)(2)(ii) and 10CFR50.73(a)(2)(iv).

At the time of this actuation, the reactor was shutdown with all thirty-seven control rod pairs fully inserted in the core. The RMS was in the "OFF" position, thus inserting a continuous manual scram. The WRC scram functions are armed and capable of completing the actuation logic when the RMS is in the "OFF" position. The signal pulse induced into these channels from electrical noise is similar to that generated from a neutron detector and therefore did not cause the wide range nuclear channels to operate in a manner outside of their design. During this event, the wide range channels responded to a noise signal and initiated automatic protective action. This unnecessary actuation of the reactor scram circuitry did not affect or degrade the operational capability of the wide range channels to detect reactor neutron flux conditions and initiate automatic protective action, as designed.

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

Based on this analysis, it is concluded that this event had no impact on safe plant operation and posed no threat to the health and safety of the public.

Similar events were reported in LER's 84-003, 85-001, 85-008, 85-025, 86-004, 86-014, 86-015, 86-028, 87-010, 87-021, 87-024, 87-027, and 87-029.

CORRECTIVE ACTION:

Public Service Company has actively pursued the identification and suppression of noise sources within the plant electrical system. Investigations of past noise related actuations of the PPS have resulted in the completion of several successful corrective actions including installation of zero crossing switches that all but eliminated spurious rod withdrawal prohibit actuations, and the grounding of unterminated and abandoned cables communicating with the control room, which reduced nuclear channel noise. These completed actions have greatly reduced noise interference problems within PPS instruments, and such efforts will continue whenever problem noise sources are identified. However, the noise source that resulted in this particular actuation of the wide range channel neutron flux rate of change scram function could not be identified, and therefore no specific action to eliminate or suppress the source can be taken at this time. Problem noise sources, when identified, will be suppressed or corrected as necessary.

In addition, a Change Notice (CN-2762) is being developed to replace or modify the existing WRC cables in an attempt to reduce the effects of electrical noise induction in the WRC instrumentation. Testing must still be conducted, however, to determine the benefits, if any, of replacing or modifying the existing cables. It is currently intended to conduct preliminary testing of cable replacement/modification during the upcoming circulator outage scheduled to begin on May 2, 1988.

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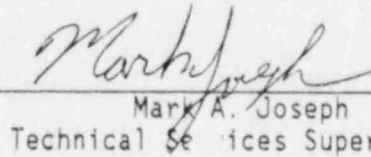
APPROVED OMB NO. 3150-0104

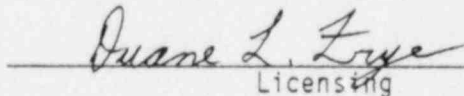
EXPIRES: 8/31/88

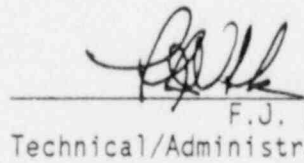
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TEXT (If more space is required, use additional NRC Form 365A's) (17)


Jeff Castor
Technical Services Engineer


Mark A. Joseph
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Company of Colorado

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March 14, 1988
Fort St. Vrain
Unit No. 1
P-88095

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

Docket No. 50-267

SUBJECT: Licensee Event Report
88-003, Final Report

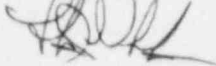
REFERENCE: Facility Operating
License No. DPR-34

Gentlemen:

Enclosed please find a copy of Licensee Event Report
No. 50-267/88-003, Final, submitted per the requirements of
10 CFR 50.73(a)(2)(iv).

If you have any questions, please contact Mr. M. H. Holmes at (303)
480-6960.

Sincerely,

C. H. Fuller by 

C. H. Fuller
Manager, Nuclear Production

Enclosure

cc: Regional Administrator, Region IV
ATTN: Mr. T. F. Westerman, Chief
Project Section B

Director Nuclear Reactor Regulation
ATTN: Mr. J. A. Calvo, Director
Project Directorate IV

Mr. R. E. Farrell
Senior Resident Inspector, FSV

CHF/djm

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