

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Fort St. Vrain, Unit No. 1 DOCKET NUMBER (2) 05000216171 OF 04 PAGE (3)

TITLE (4) WIDE RANGE NUCLEAR CHANNEL UPSCALED FROM NOISE SOURCE AND ACTUATED SCRAM CHANNEL

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)	
05	09	88	88	010	00	06	08	88	N/A	050000	

OPERATING MODE (9) N

POWER LEVEL (10) 0100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)

20.402(b)		20.406(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	<input type="checkbox"/>	73.71(b)	<input type="checkbox"/>
20.406(a)(1)(i)	<input type="checkbox"/>	50.36(c)(1)	<input type="checkbox"/>	50.73(a)(2)(v)	<input type="checkbox"/>	73.71(c)	<input type="checkbox"/>
20.406(a)(1)(ii)	<input type="checkbox"/>	50.36(c)(2)	<input type="checkbox"/>	50.73(a)(2)(vii)	<input type="checkbox"/>	OTHER (Specify in Abstract below and in Text, NRC Form 366A)	<input type="checkbox"/>
20.406(a)(1)(iii)	<input type="checkbox"/>	50.73(a)(2)(i)	<input type="checkbox"/>	50.73(a)(2)(viii)(A)	<input type="checkbox"/>		
20.406(a)(1)(iv)	<input type="checkbox"/>	50.73(a)(2)(ii)	<input type="checkbox"/>	50.73(a)(2)(viii)(B)	<input type="checkbox"/>		
20.406(a)(1)(v)	<input type="checkbox"/>	50.73(a)(2)(iii)	<input type="checkbox"/>	50.73(a)(2)(ix)	<input type="checkbox"/>		

LICENSEE CONTACT FOR THIS LER (12)

NAME Mark A. Joseph, Technical Services Supervisor TELEPHONE NUMBER 303620-1203

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS

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 0900 hours on May 9, 1988, with scram channel "C" tripped for surveillance test purposes, the Plant Protective System (PPS) scram function was spuriously actuated when wide range nuclear channel IV spiked upscale and actuated scram channel "B". Actuation of scram channels "B" and "C" completed the minimum actuation logic and therefore initiated a reactor scram signal. At the time of this event, the reactor was shutdown and all thirty-seven control rod pairs were fully inserted into the core. No control rod movement occurred as a result of this scram actuation.

Since the actuation of the reactor scram circuitry was not part of a preplanned sequence of events, it is being reported in accordance with the requirements of 10CFR50.73(a)(2)(iv).

The cause of the upscale response and trip of wide range channel IV was noise induction into the channel. The specific source of this noise could not be identified.

Public Service Company has actively pursued the identification and suppression of noise sources within the plant electrical system. PSC will continue to suppress or correct problem noise sources as they are identified. Currently, a Change Notice (CN-2762) is being developed to modify the wide range channels in an attempt to reduce the effects of electrical noise.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8 8	0 1 1 0	0 0	0 2	OF 0 4

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

EVENT DESCRIPTION:

On May 9, 1988, the reactor was shutdown with the "B" helium circulator [AA] operating on steam and the Loop I reheater [AA] in service. Average reactor core outlet temperature was approximately 250°F. All thirty-seven control rod pairs [AB] were fully inserted into the core. At approximately 0800 hours on the morning of May 9, instrument and control technicians began performing the monthly reheat steam temperature scram test (SR 5.4.1.1.8.b-M). This test requires that each of the three reheat scram channels be tripped, only a single channel being tripped at any one time, thereby verifying trip setting, alarms, and proper indication. By tripping a single reheat temperature scram channel, a single channel reactor scram is initiated. In this configuration (i.e., one scram channel tripped and the remaining two channels not tripped), a trip on either of the remaining two scram channels will complete the "two of three" actuation logic and initiate a reactor scram. On May 9, 1988, at 0900 hours, with scram channel "C" tripped as part of the reheat temperature scram test, wide range nuclear channel IV upscalded in response to electrical noise, and caused a "rate of change high" trip on scram channel "B". This trip on the scram channel "B" in conjunction with the trip already up on scram channel "C" for reheat testing completed the minimum actuation logic and initiated a reactor scram signal as designed. Since all thirty-seven control rod pairs were fully inserted into the core at the time of this event, no control rod movement occurred as a result of the scram signal.

Control room operators verified normal shutdown core flux readings on control room nuclear instrumentation.

CAUSE DESCRIPTION:

The pulse sensing design of the wide range channels, in combination with the low core count rate during shutdown conditions, makes the wide range channels "rate of change high" scram function susceptible to induced electrical noise during reactor shutdown conditions. During reactor operation (i.e., Reactor Mode Switch 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 electrical 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 wide range channel neutron flux "rate of change high" 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, wide range channel IV responded on May 9, 1988, to a noise pulse and automatically actuated a single channel of the PPS reactor scram circuitry. With another scram channel already tripped for surveillance testing, this "rate of change high" signal completed the minimum actuation logic.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

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 Interlock Sequence Switch (ISS) was in the "STARTUP" position. The wide range channel scram functions are armed and capable of completing the actuation logic when the ISS is in the "STARTUP" position. The signal pulse induced into channel IV from electrical noise is similar to that generated from a neutron detector and therefore did not cause wide range nuclear channel IV to operate in a manner outside of its design. During this event, wide range channel IV responded to a noise signal and initiated automatic protective action. This unnecessary actuation of the reactor scram circuitry did not degrade the operational capability of the wide range channels to monitor reactor neutron flux and initiate automatic protective action, as designed.

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, 87-029, 88-003, and 88-005.

CORRECTIVE ACTION:

Public Service Company is actively pursuing 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 eliminated spurious rod withdrawal prohibit : : tions, and the grounding of unterminated and abandoned cables communicating with the control room. These completed actions have greatly reduced noise interference problems within PPS instruments, and such efforts will continue whenever problem noise sources are identified.

The noise source that resulted in this particular actuation of the wide range channel "rate of change high" scram function could not be specifically identified, and therefore no specific action to eliminate or suppress the source can be taken at this time. However, a Change Notice (CN-2762) is being developed to modify the existing wide range channels in an attempt to reduce the effects of electrical noise induction in the channel instrumentation. Investigative testing to identify the primary noise sources and how these sources interface with the wide range channels is currently scheduled to begin during the circulator outage in July 1988.

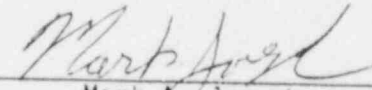
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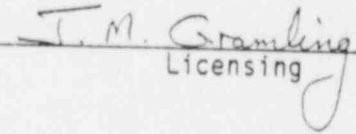
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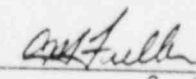
 Jim Hill
 Technical Services Engineer



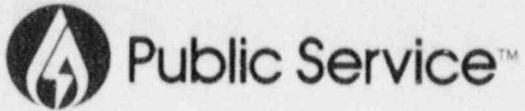
 Mark A. Joseph
 Technical Services Supervisor



 J. M. Gramling
 Licensing



 C. H. Fuller
 Manager, Nuclear Production



Public Service
Company of Colorado

16805 WCR 19 1/2, Platteville, Colorado 80651

June 9, 1988
Fort St. Vrain
Unit No. 1
P-88191

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

Docket No. 50-267

SUBJECT: Licensee Event Report
88-010-00, Final Report

REFERENCE: Facility Operating
License No. DPR-34

Gentlemen:

Enclosed please find a copy of Licensee Event Report
No. 50-267/88-010-00, 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
Manager, Nuclear Production

Enclosure

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

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

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

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