

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Fort St. Vrain, Unit No. 1 DOCKET NUMBER (2) 050002677 PAGE (3) 1 OF 06

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)
1	2	0	7	8	7	0	2	9	N/A			0 5 0 0 0
1	2	0	7	8	7	0	2	9				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)

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

LICENSEE CONTACT FOR THIS LER (12)

NAME Mark A. Joseph, Technical Services Supervisor TELEPHONE NUMBER 303 620-1203

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
A	JIC	RLIY	G2910	Y					
A	JIC	CIPIU	G10613	Y					

SUPPLEMENTAL REPORT EXPECTED (14) YES (if yes, complete EXPECTED SUBMISSION DATE) X NO

EXPECTED SUBMISSION DATE (15) MONTH DAY YEAR

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

On December 7, 1987, at approximately 2248 hours, and again on December 8, 1987, at approximately 1320 hours, reactor scram actuations were received on all three wide range channels neutron flux rate of change high.

The cause of the reactor scram actuations was due to electrical noise induced from the incorrect landing of a 120V AC lead in a 15V DC Plant Protective System (PPS) circuit. This lead was connected to the incorrect terminal during the return of a clearance. The subsequent independent verification and Functional Test did not identify the miswired lead prior to energizing the circuit and causing the reactor scram actuations.

Since the reactor remained shutdown with all 37 control rod pairs fully inserted in the core and their power supply breakers open during these actuations, the actuations affected alarm circuitry only. No control rod movement occurred.

The Superintendent of Maintenance discussed this event in detail with the individuals who returned and verified the clearance. The mispositioned lead was returned to the proper terminal location and relay XCR-93159-A and logic module CT-1AL1 were replaced.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT: If more space is required, use additional NRC Form 305A's (17)

BACKGROUND:

On October 4, 1987, cable 7487 (*CBL) was cleared out for repair of damage caused by the hydraulic oil fire of October 3, 1987, reported in Licensee Event Report 50-267/87-023. This cable provides for control of the Loop I Feedwater Attenuator valve HV-22133 (*TCV). The control section of the circuit was isolated by lifting leads 46, 47, 48, and 53 from TB8 in panel I-05 (*PNL). On December 1, 1987, following work performed under Change Notice CN-2701, cable 7487 was returned to service. During the reconnection of the cable 7487 leads to TB8 in I-05, the ground return wire for solenoids HSV-22133-1 and HSV-22133-3 (*SOL) was inadvertently connected to the reset circuit of relay XCR-92159-A (*RLY) at TB8-49 instead of the proper location at TB8-53 (Refer to Figure 1). Subsequent independent verification and Functional Test failed to detect the mispositioned lead.

EVENT DESCRIPTION:

On December 7, 1987, at 2248 hours, with the reactor shutdown and all control rods fully inserted, a Plant Protective System (PPS) reactor scram actuation was received on neutron flux rate of change high on all three wide range channels. On December 8, 1987, at 1320 a reactor scram actuation was again received on neutron flux rate of change high on all three wide range channels (*JI). On both occasions the reactor scram actuations appeared to be associated with the operation of hand switch HS-2241 (*HS). Subsequent investigation discovered the mispositioned wire at TB8-49 in I-05. The result of the incorrect wire location was to apply 120V AC to the 15V DC reset circuit for relay XCR-93159-A whenever hand switch HS-22133 (*HS) was closed and hand switch HS-2241 was opened (Refer to Figure 1). The application of 120V AC to XCR-93159-A damaged the relay and caused it to chatter when energized from the operation of hand switch HS-2241. This chattering induced noise into the wide range channel neutron flux rate of change circuits and produced the reactor scram actuations.

CAUSE DESCRIPTION:

Personnel Error

The root cause of the incorrect location of the cable 7487 wire at TB8-49 was inattentiveness on the part of both the electrician and the independent reviewer.

* Energy Industry Identification System (EIIS) Codes

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

The subsequent Functional Test of cable 7487 failed to detect the incorrect wire position due to circuit design and operation. With hand switch HS-22133 open, 120V AC is not applied to solenoids HSV-22133-1 and HSV-22133-3, and therefore not to relay XCR-93159-A. With hand switches HS-2241 and HS-22133 both closed, the reset circuit of relay XCR-93159-A is held at signal ground, thereby allowing current from solenoids HSV-22133-1 and HSV-22133-3 to pass to signal ground without affecting relay XCR-93159-A. This is the condition that allowed the Functional Test for cable 7487 to be satisfactorily completed. Under the plant conditions existing at the time, only the operation of hand switch HS-2241 to the open position with hand switch HS-22133 in the closed position could have created a condition whereby the mislocated wire would be detected. Since hand switch HS-2241 is not a design part of the circuit which was tested, its operation was not part of the Functional Test performed for cable 7487. The subsequent operation of hand switch HS-2241 during testing prior to reactor startup eventually led to the discovery and correction of the mislocated wire.

SAFETY ANALYSIS:

Since these reactor scram actuations were not part of a preplanned sequence, they are being reported per the requirements of 10CFR50.73(a)(2)(iv). During these actuations, the reactor remained shutdown and all 37 control rod pairs were fully inserted in the core with their power supply breakers open. The actuations therefore affected the logic and alarm circuitry only. No control rod movement occurred.

Although the scram actuations on neutron flux rate of change high were not indicative of actual changes in core neutron flux level, the wide range channels and the PPS reactor scram logic and alarm circuitry did operate as designed to initiate automatic protective actions.

Based on the above analysis, it is concluded that this event had no impact on public health and safety.

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 and 87-024.

CORRECTIVE ACTION:

The Superintendent of Maintenance discussed this event in detail with the individuals who returned the clearance on cable 7487. The results of mislanding the lead, including personnel safety, equipment damage, and associated costs were covered. It was emphasized that work must be performed correctly above all other considerations.

* Energy Industry Identification System (EIIS) Codes

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

The ground return lead for solenoids HSV-22133-1 and HSV-22133-3 from cable 7487 was relocated to the proper position at TB8-53 in panel I-05. Relay XCR-93159-A and logic module CT-1AL1 (*CPU) which were damaged by high voltage were replaced.

* Energy Industry Identification System (EIIS) Codes

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

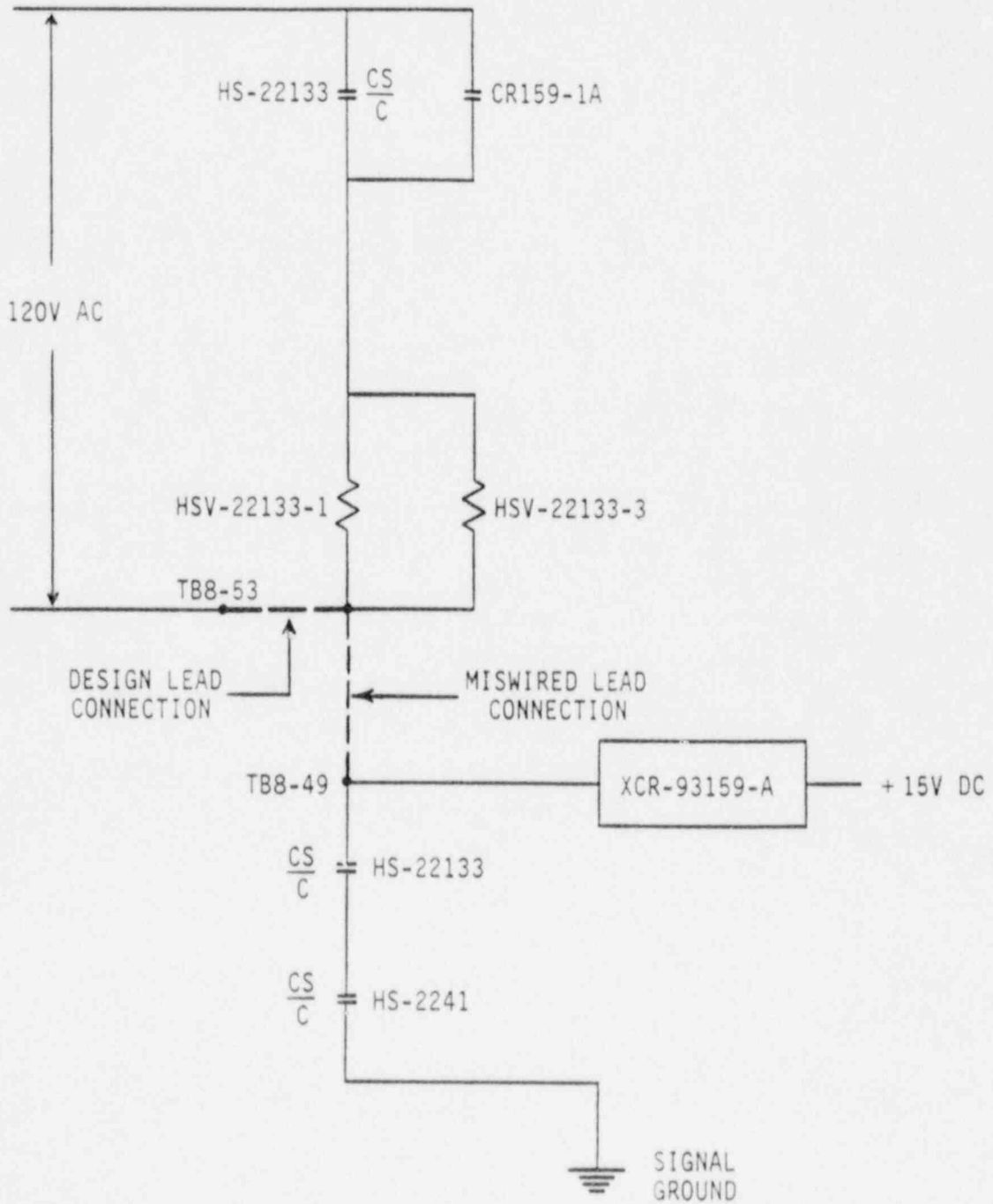
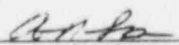



FIGURE 1

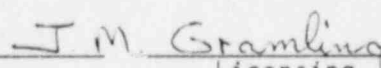
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TEXT (If more space is required, use additional NRC Form 366A's) (17)


Arthur R. Stithem
Technical Services Senior Technician


Mark A. Joseph
Technical Services Supervisor


J.M. Gramling
Licensing


C. H. Fuller
Station Manager



Public Service™

January 6, 1988
Fort St. Vrain
Unit No. 1
P-88007

Public Service
Company of Colorado

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

Docket No. 50-267

SUBJECT: Licensee Event Report
87-029, Final Report

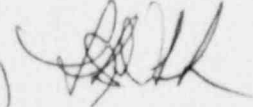
REFERENCE: Facility Operating
License No. DPR-34

Gentlemen:

Enclosed please find a copy of Licensee Event Report
No. 50-267/87-029, 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,

R. O. Williams by 

R. O. Williams, Jr.
Vice President
Nuclear Operations

Enclosure

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

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

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

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