

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)

PRAIRIE ISLAND UNIT 1

DOCKET NUMBER (2)

0 5 0 0 0 2 8 2

PAGE (3)

1 OF 0 2

TITLE (4)

Reactor Trip Caused by Troubleshooting in Generator Voltage Regulator

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	9	1	5	8	5	8	5	0	1	2	0	5	0	0	0		

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 8: (Check one or more of the following) (11)									
POWER LEVEL (10)	11010	20.402(b)		20.406(a)		X	50.73(a)(2)(iv)		73.71(b)		
		20.406(a)(1)(i)		50.36(a)(1)			50.73(a)(2)(v)		73.71(e)		
		20.406(a)(1)(ii)		50.36(a)(2)			50.73(a)(2)(vi)		OTHER (Specify in Abstract below and in Text, NRC Form 308A)		
		20.406(a)(1)(iii)		50.73(a)(2)(i)			50.73(a)(2)(viii)(A)				
		20.406(a)(1)(iv)		50.73(a)(2)(ii)			50.73(a)(2)(viii)(B)				
		20.406(a)(1)(v)		50.73(a)(2)(iii)			50.73(a)(2)(ix)				

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
Arne A. Hunstad, Staff Engineer	6 1 1 2 3 8 8 1 - 1 1 1 2 1 1

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
		X					

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

With Unit 1 at 100% power, troubleshooting activities in the main generator voltage regulator produced a voltage transient which resulted in a reactor trip. Corrective action focuses on training.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1) PRAIRIE ISLAND UNIT 1	DOCKET NUMBER (2) 0 5 0 0 0 2 8 2 8 5 — 0 1 2 —	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

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

On September 15, 1985, Unit 1 was at 100% power and Unit 2 was shutdown for refueling. The Unit 1 main generator voltage regulator (90) was on, and voltage on the transmission system was high, about 354KV. Safeguards 4KV buses (BU) 15 and 16 were being supplied by 1R Transformer (XFMR), bus 26 was being supplied by CT12 Transformer and bus 25 by 2R Transformer.

At 0050 a Control Room operator attempted to lower generator output voltage using the voltage adjuster; the regulator did not respond. The system dispatcher was notified. At 0055, the voltage regulator was turned off and an investigation begun to learn why the regulator did not work to lower excitation. During the investigation, a signal mixing card in the automatic control section of the regulator was pulled. When the regulator is off, the output from this card is grounded. Removing the card removed the ground, which resulted in an output signal calling for increased excitation. The Control Room operator responded to this voltage transient by lowering excitation voltage with the base adjuster. The regulator responded and excitation voltage dipped into the operating range of the loss-of-excitation relay, resulting in generator (GEN) lockout and turbine (TRB) trip/reactor (RCT) trip at 0451. Following the trip, 345KV grid voltage reached about 365KV steady state. The 161KV voltage spiked but returned to about 168KV. Plant 4KV bus voltages momentarily exceeded the plant operating limit of 4400V during the transient, but remained below 4400V steady state.

The system dispatcher was notified to lower 345KV grid voltage to below 354KV, which he did.

Upon further investigation, it was learned that the regulator had been performing properly all along. The lack of response observed initially was due to proper operation of the minimum excitation limiter (MEL), a feature of regulator logic with which plant personnel were not familiar. (The MEL curve is more restrictive than the generator capability curve.) During troubleshooting, the apparent problem seemed to exist in the signal mixing card of the regulator; only a very in-depth look at the regulator control system could have revealed the MEL logic and the potential problems associated with pulling the card.

This event will be discussed in the licensed operator requalification program and with involved technical personnel. The capability curve will be revised to show range of operation of the MEL. Annunciation of limiter operation may be helpful; feasibility is being studied.



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U S Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket No. 50-282 License No. DPR-42

Reactor Trip Caused by Troubleshooting
in Generator Voltage Regulator

The License Event Report for this occurrence is attached.

This event was reported via Emergency Notification System per 10 CFR Part 72
on September 15, 1985.

Eugene Eckholt

for David Musolf
Manager - Nuclear Support Services

DMM/EFE/jk

c: Regional Administrator-III, NRC
NRR Project Manager, NRC
Resident Inspector, NRC
MPCA
Attn: J W Ferman

Attachment

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