

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Callaway Plant Unit 1 DOCKET NUMBER (2) 0 5 0 0 0 4 8 3 1 OF 0 4 PAGE (3)

TITLE (4) Reactor Trip Due to Loss of Field to the Main Generator

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	8	2	0	8	5	0	3	8			0 5 0 0 0
0	8	2	0	8	5	0	0	9	1 7 8 5		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)									
1		20.402(b)		20.405(c)	X	50.73(a)(2)(iv)		73.71(b)			
POWER LEVEL (10)	1 0 0	20.405(a)(1)(i)		50.36(a)(1)		50.73(a)(2)(v)		73.71(c)			
		20.405(a)(1)(ii)		50.36(a)(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)(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)(ix)					
		20.405(a)(1)(vi)		50.73(a)(2)(iv)		50.73(a)(2)(x)					

LICENSEE CONTACT FOR THIS LER (12)
NAME W. R. Campbell - Superintendent, Engineering TELEPHONE NUMBER 3 1 4 6 7 6 1 - 1 8 4 6 9
AREA CODE

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	CAUSE	SYSTEM
X	T/L	R/H/E	0 0 2 6	N							
X	T/L	E/C/B/D	0 8 0	N							

SUPPLEMENTAL REPORT EXPECTED (14)
X YES (If yes, complete EXPECTED SUBMISSION DATE) NO
EXPECTED SUBMISSION DATE (15) 1 1 2 9 8 5
MONTH DAY YEAR

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

At 0114 CDT on 8/20/85, Operators were adjusting unit output voltage when field excitation was lost to the main generator resulting in a generator trip and subsequent Turbine Trip/Reactor Trip. A Feedwater Isolation, Auxiliary Feedwater Actuation and Steam Generator Blowdown Isolation occurred per design. The 13.8 kV nonsafety-related buses were lost due to the generator trip-induced voltage fluctuations which, according to plant design, prevented the Automatic Bus Transfer (ABT) fast transfer between the Unit Auxiliary and Startup Transformers. This resulted in loss of the Heater Drain, Condensate, Circulating Water, and Reactor Coolant Pumps. Within two seconds, the ABT made a dead bus transfer and re-energized the buses. Operators stabilized the plant and completed trip recovery procedures. The unit was in Mode 1, Power Operation, at 100% power and normal operating temperature and pressure at the time of the trip.

Investigations have attributed the loss of field to a failure in the voltage regulator circuitry. Circuit components were replaced and are being sent to the vendor for determination of the type and cause of the failure. In the interim, testing has been developed to test operation of the regulators on a periodic basis.

Since the appropriate safety features responded per design, the public health and safety was not threatened by this event.

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PDR ADOCK 05000483
S PDR

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

FACILITY NAME (1) Callaway Plant Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 4 8 3 8 5	LER NUMBER (6)			PAGE (3)		
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		8 5	0 3 8	0 0	0 2	OF	0 4

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

On 8/20/85, the plant was operating in Mode 1, Power Operation, at 100% power and normal operating temperature and pressure. At 0114 CDT, the Balance of Plant Operator was performing routine morning reduction in generator output voltage requested by Load Dispatch, when he noticed the voltage regulator manual/auto signal match meter, ⁽¹⁾ MB EI ⁽²⁾, suddenly spike low indicating loss of field to the main generator. This resulted in a generator trip which initiated a Turbine Trip and with the plant operating above the P-9 setpoint (50% power), caused a Reactor Trip. Due to the large voltage fluctuations on the grid, ⁽³⁾ as a result of this event, ⁽⁴⁾ synchronization between the Unit Auxiliary and Startup transformers was lost preventing a fast transfer of the Automatic Bus Transfer (ABT). This failure to fast transfer is in accordance with ⁽⁵⁾ plant design. As a result, the two nonsafety-related 13.8 kV buses, PA01 and PA02, were momentarily de-energized. Loss of these buses caused a loss of the following equipment:

- 1) Heater Drain Pumps ⁽⁶⁾
- 2) Condensate Pumps ⁽⁷⁾
- 3) Circulating Water Pumps ⁽⁸⁾
- 4) Reactor Coolant Pumps ⁽⁹⁾

PA01 and PA02 were re-energized in approximately 2 seconds when the ABT made a dead bus transfer.

Due to shrink in the Steam Generators (S/G) ⁽¹⁰⁾ as a result of the Turbine Trip/Reactor Trip transient, a Feedwater Isolation, Auxiliary Feedwater Actuation, and S/G Blowdown Isolation occurred. All associated equipment performed as designed.

By 0122 CDT on 8/20/85, Operators had restarted the RCP's and at approximately 0130 CDT on 8/20/85 plant conditions were stabilized in accordance with plant operating procedures.

Due to a similar Reactor Trip reported in LER 85-005-00, investigations and field tests on 8/20/85 and 8/21/85 focused on two possible causes of the loss of field excitation. One possibility is that a sudden open circuit in the automatic voltage regulator rheostat ⁽¹¹⁾ (Manufacturer - Ohmite Manufacturing Company, Model No. H) occurred. Second is the possibility of failure in the automatic regulator board circuitry ⁽¹²⁾ (Manufacturer - General Electric Company, Model No. 44C300339-G03). However, a field operability check of these components after each event failed to reveal evidence of any defects.

As a result of this event and LER 85-005-00, the rheostat and the automatic regulator board were replaced. These components are being returned to the vendor (General Electric Company-GE) for further

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

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

investigation. In addition, testing has been developed that tests operation of the automatic and manual voltage regulators (13) while the generator is at power. This test will be run on a periodic basis. A supplemental report will be submitted describing the results of the GE investigation and define additional actions to prevent recurrence if required.

No safety consequences resulted from this event. Appropriate safety features and components were available and functioned properly to stabilize plant conditions upon shutdown. Therefore, this incident did not pose a threat to the public health and safety.

Previous occurrences: LER 85-005-00

Footnotes

- (1) Meter: IEEE Std. 805-1983 System - TL
IEEE Std. 803A-1983 Component - MTR
- (2) Main Generator: IEEE Std. 805-1983 System - TB
IEEE Std. 803A-1983 Component - TG
- (3) Auxiliary Transformer: IEEE Std. 805-1983 System - EA
IEEE Std. 803A-1983 Component - XFMR
- (4) Startup Transformer: IEEE Std. 805-1983 System - EA
IEEE Std. 803A-1983 Component - XFMR
- (5) 13.8 kV Bus: IEEE Std. 805-1983 System - EA
IEEE Std. 803A-1983 Component - BU
- (6) Heater Drain Pump: IEEE Std. 805-1983 System - SN
IEEE Std. 803A-1983 Component - P
- (7) Condensate Pump: IEEE Std. 805-1983 System - KA
IEEE Std. 803A-1983 Component - P
- (8) Circulating Water Pump: IEEE Std. 805-1983 System - NN
IEEE Std. 803A-1983 Component - P
- (9) Reactor Coolant Pump: IEEE Std. 805-1983 System - AB
IEEE Std. 803A-1983 Component - P

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

FACILITY NAME (1) Callaway Plant Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 4 8 3 8 5 —	LER NUMBER (6)			PAGE (3)		
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Footnotes (Cont.)

- (10) Steam Generator: IEEE Std. 805-1983 System - AB
IEEE Std. 803A-1983 Component - SG
- (11) Rheostat: IEEE Std. 805-1983 System - TL
IEEE Std. 803A-1983 Component - RHE
- (12) Automatic Regulator Board: IEEE Std. 805-1983 System - TL
IEEE Std. 803A-1983 Component - ECBD
- (13) Regulator: IEEE Std. 805-1983 System - TL
IEEE Std. 803A-1983 Component - RG

UNION ELECTRIC COMPANY
CALLAWAY PLANT

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September 17, 1985

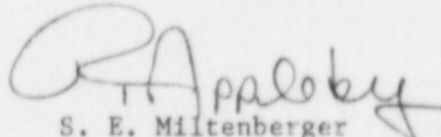
U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

ULNRC-1177

Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-30
LICENSEE EVENT REPORT 85-038-00
REACTOR TRIP DUE TO LOSS OF FIELD TO THE MAIN GENERATOR

The enclosed Licensee Event Report is submitted pursuant to
10 CFR 50.73(a)(2)(iv) concerning a Reactor Trip and Engineered Safety
Features Actuations which resulted from a loss of field to the main
generator.


S. E. Miltenberger
Manager, Callaway Plant *for SEM*

wrc seme
WRC/SEMe/drs
Enclosure

cc: Distribution attached

IE22

11.

cc distribution for ULNRC-1177

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