



September 15, 1995

U. S. Nuclear Regulatory Commission
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ULNRC-3268

Gentlemen:

**DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-30
LICENSEE EVENT REPORT 95-005-00
REACTOR TRIP DUE TO TURBINE TRIP AT GREATER THAN
50% REACTOR POWER DUE TO LOSS OF CONDENSER VACUUM**

The enclosed Licensee Event Report is submitted pursuant to 10CFR 50.73(a)(2)(iv) concerning a reactor trip due to turbine trip at greater than 50% reactor power due to loss of condenser vacuum.

A handwritten signature in cursive script that reads "R. D. Affolter".

R. D. Affolter
Manager, Callaway Plant

RDA/HDB/MAH/cmw

Enclosure

cc: Distribution attached

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Callaway Plant Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 4 8 3	PAGE (3) 1 OF 0 4
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TITLE (4) **Reactor Trip Due to Turbine Trip at Greater Than 50% Reactor Power Due to Loss of Condenser Vacuum**

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV. NO.	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)
0 8	1 6	9 5	9 5	0 0 5	0 0	0 9	1 5	9 5			0 5 0 0 0

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check one or more of the following) (11)									
POWER LEVEL (10) 1 0 0	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 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)	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)(x)								

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
NAME H. D. Bono, Supervising Engineer, Site Licensing		AREA CODE 3 1 4 6 7 6 - 4 4 2 8	

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)	EXPECTED SUBMISSION DATE (16)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO				

ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines)(18)

On 8/16/95 at 0943 CDT, with the plant at 100% reactor power, the "A" Circulating Water Pump breaker tripped due to a failed field excitation rheostat. This resulted in an automatic main turbine load setback with actuation of the main condenser steam dump valves. Loss of the circulating water pump and actuation of the valves, caused pressure in the condenser to increase rapidly to the main turbine trip setpoint. The main turbine trip resulted in a reactor trip, feedwater isolation, and auxiliary feedwater actuation.

Subsequent investigation determined that main condenser pressure increased to the main turbine trip setpoint before Condenser Pressure Interlock (C-9) closure of the condenser steam dump valves could reduce pressure buildup. This was due in part to the main turbine trip and C-9 setpoints being out of tolerance.

The pump rheostat was replaced and the transmitters for the C-9 loops and main turbine trip switches were recalibrated. The plant was returned to Mode 1 at 0300 on 8/17/95. Improvements to circulating water pump field excitation system reliability and the design/calibration of the main turbine trip switches and C-9 transmitters will be evaluated.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

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TEXT If more space is required, use additional NRC Form 368A's(17)

BASIS FOR REPORTABILITY:

This event is reportable per the requirements of 10CFR50.73(a)(2)(iv) due to automatic reactor protection system and engineered safety feature actuations.

PLANT CONDITION AT TIME OF EVENT:

Mode 1 - Power Operations; 100% Reactor Power

Reactor Coolant System: Temperature (average) - 587.6 degrees F

Pressure - 2236 psig

DESCRIPTION OF EVENT:

On 8/16/95 at 0943 CDT, the "A" Circulating Water Pump ⁽¹⁾ breaker tripped due to a failed field excitation rheostat ⁽²⁾. This resulted in an automatic main turbine load setback with actuation of the main condenser steam dump valves ⁽³⁾. Licensed Operators responded to the event in accordance with OTO-MA-00001, "Load Rejection". Loss of the circulating pump and actuation of the condenser steam dump valves, caused pressure in the condenser to increase rapidly to the main turbine trip setpoint within approximately 28 seconds. The main turbine trip resulted in a reactor trip, subsequent feedwater isolation and auxiliary feedwater actuation. Licensed Operators responded to the Reactor Trip in accordance with emergency procedures E-0, "Reactor Trip" and ES-0.1, "Reactor Trip Response" and the plant was stabilized in mode 3.

Subsequent investigation into the event determined that the main condenser pressure increased to the main turbine trip setpoint before Condenser Pressure Interlock (C-9) ⁽⁴⁾ closure of the condenser steam dump valves could reduce pressure buildup. This was due in part to setpoints on ACPSHH0201 and 202 "Low Pressure Turbine A Hood Vacuum Trip HI/HI Pressure Switch" ⁽⁵⁾ being found out of tolerance low and the setpoint for Condenser Pressure Interlock (C-9) being found out of tolerance high. This resulted in a 0.05 inHg margin between C-9 actuation to close the condenser steam dumps and actuation of the main turbine trip function as opposed to a normal margin of approximately 0.80 inHg. The calibration problems for C-9 were due in part to temperature induced drift of the pressure gauge used for this calibration. Sources of error for the trip switches are still under investigation.

**LICENSEE EVENT REPORT (LER)
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TEXT If more space is required, use additional NRC Form 3664's(17)

ROOT CAUSE:

The root cause of the reactor trip was turbine trip at greater than 50% reactor power due to loss of condenser vacuum.

CORRECTIVE ACTIONS:

At 1349 CDT the field excitation rheostat was replaced and the circulating water pump was tested to verify proper operation. No problems were identified and the pump was subsequently placed back in service. The transmitters for the C-9 loops and main turbine trip switches were subsequently recalibrated and the plant was returned to Mode 1 at 0300 CDT on 8/17/95.

Further corrective actions for the event will include:

1. Evaluation of methods to improve circulating water pump field excitation system reliability.
2. Evaluation of calibration methods/timing to enhance consistency between instrumentation for the main turbine trip and C-9 interlock functions.
3. Evaluation of the design of the main turbine trip switches and C-9 transmitters for possible replacement to improve reliability.
4. Evaluation of the C-9 setpoint to determine if it can be adjusted to provide additional margin between main condenser steam dump valve closure and main turbine trip.

SAFETY SIGNIFICANCE:

The reactor automatically tripped per design due to the turbine trip. Plant safety features functioned as required. There was no threat to the public health or safety.

PREVIOUS OCCURRENCES:

None.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

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TEXT (if more space is required, use additional NRC Form 306A's)(17)

FOOTNOTES:

The system and component codes listed below are from IEEE Standards 805-1984 and 803A-1983 respectively:

(1) System - NN, Component - P

(2) System - NN, Component - RHE

Manufacturer: General Electric

Description: Rheostat, 10 OHM, 125 V, 7.3 A IN, 17.4 A

Part Number: IC8070EC101AA29

(3) System -SG, Component - PSV

(4) System - SH, Component - PS

(5) System - IT, Component - PS