



Callaway Plant

April 20, 1992

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

ULNRC-2621

Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-30
LICENSEE EVENT REPORT 92-004-00
AUXILIARY FEEDWATER ACTUATION SIGNAL OCCURRED
WHEN THE LICENSED OPERATORS SECURED THE 'B' MAIN FEEDWATER
PUMP DUE TO MAIN TURBINE VIBRATION DURING A PLANT SHUTDOWN

The enclosed Licensee Event Report is submitted pursuant to 10 CFR 50.73(a)(2)(iv) concerning an unplanned Auxiliary Feedwater Actuation Signal when the 'B' Main Feedwater Pump was secured after breaking condenser vacuum to reduce main generator turbine vibration.

J. D. Blosser
Manager, Callaway Plant

^{TPS}
JDB/TPS/MNF/lrj

Enclosure

cc: Distribution attached

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) **Callaway Plant Unit 1** DOCKET NUMBER (2) **050004831** PAGE (3) **1 OF 04**

TITLE (4) **Auxiliary Feedwater Actuation Signal Occurred When The Licensed Operators Secured The 'B' Main Feedwater Pump Due To Main Turbine Vibration During A Plant Shutdown**

EVENT DATE (5)			LFR 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)
03	20	92	92	004	00	04	20	92			05000
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)											

OPERATING MODE (8) 2	20.402(i)	20.406(c)	<input checked="" type="checkbox"/>	90.73(a)(2)(v)	72.71(b)
POWER LEVEL (10) 001	20.406(a)(1)(ii)	90.38(c)(1)		90.73(a)(2)(v)	72.71(c)
	20.406(a)(1)(iii)	90.38(c)(2)		90.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.406(a)(1)(iv)	90.73(a)(2)(i)		90.73(a)(2)(vii)	
	20.406(a)(1)(v)	90.73(a)(2)(ii)		90.73(a)(2)(viii)(A)	
		90.73(a)(2)(iii)		90.73(a)(2)(viii)(B)	
		90.73(a)(2)(iv)		90.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (52)

NAME: **Thomas P. Sharkey, Supervising Engineer, Site Licensing** TELEPHONE NUMBER: **314 676-8336**

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

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

On 3/20/92 at 0317 CST, an Auxiliary Feedwater Actuation Signal (AFAS) occurred when 'B' Main Feedwater Pump (MFP) was secured after breaking condenser vacuum due to main generator turbine vibration. The plant was in Mode 2, Startup, Reactor Power < 1%.

On 3/20/92, licensed Reactor Operators (RO) were reducing turbine load to shutdown the plant for a refueling outage. At 0145, turbine load was 180 MegaWatts electrical (MWe) when Steam Generator levels began to oscillate. At 0300, turbine load was steady at 45 MWe when high vibration alarms were received. At 0302, the turbine vibration alarm annunciated. The RO tripped the turbine; broke condenser vacuum to reduce turbine speed; manually started the 'A' and 'B' motor driven Auxiliary Feedwater pumps and secured the 'B' MFP. The AFAS occurred at 0317 per design.

The AFAS was a direct result of the 'B' MFP being secured. Since 'A' MFP had been previously secured, this action satisfied the automatic logic to start both motor driven Auxiliary Feedwater pumps. As contributing factors, plant shutdown procedures did not limit time at low loads, and the turbine vibration off-normal procedure may be overly conservative as the turbine rolls through critical speeds. Plant procedures will be revised to limit operation at low power and the off-normal procedure will be reviewed for possible revision.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 Hrs. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

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		YEAR 9 2	SEQUENTIAL NUMBER - 0 0 4	REVISION NUMBER - 0 0 0	2	OF 0 4

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

BASIS FOR REPORTABILITY:

On 03/20/92 at 0317 CST, an Auxiliary Feedwater Actuation Signal (AFAS) occurred when the licensed operators secured the 'B' Main Feedwater Pump (MFP) after breaking main condenser vacuum due to high main turbine vibration. This report is submitted pursuant to 10CFR50.73(a)(2)(iv) to report an event which resulted in the unplanned automatic actuation of an Engineered Safety Feature (ESF).

CONDITIONS AT THE TIME OF EVENT:

Mode - 2 Startup
 Reactor Power - < 1%
 Reactor Coolant System temperature - 560 degrees F
 Reactor Coolant System pressure - 2224 psig

DESCRIPTION OF EVENT:

On 3/20/92, utility licensed operators were reducing the main generator turbine² load to shutdown the plant for a refueling outage. At approximately 0145 with turbine load reduced to 180 MWe, 'C' and 'D' steam generator³ levels began to oscillate. These oscillations continued as turbine load was slowly reduced in preparation for taking the turbine off line. The operators initially delayed removing the unit from service while they attempted to stabilize steam generator levels. At 0300, the turbine load was steady at 45 MWe when individual high vibration⁴ alarms were received approximately one minute apart for turbine bearings⁵ number 4 and 5. Sustained turbine operation at low steam flow⁶ can result in uneven heat loading of the turbine and increased turbine vibration. At 0302, with the turbine steady at 45 MWe, the turbine vibration alarm (setpoint 10 mils) annunciated. At 0305, the licensed Shift Supervisor directed the Balance of Plant (BOP) Reactor Operator (RO) to trip the turbine per the plant's turbine vibration off-normal procedure. At 0316, during turbine coastdown, bearings number 3 and 4 approached 15 mils and the Shift Supervisor directed the BOP RO to break condenser vacuum⁷, as required by the procedure, in an attempt to reduce the turbine speed more rapidly. The RO manually started the 'A' and 'B' motor driven Auxiliary Feedwater pumps⁸ and secured the 'B' MFP at 0317, prior to the pump automatically tripping due to low condenser vacuum. Securing the second MFP caused the AFAS⁸ to occur per design. At 0348, the operators blocked the MFP trip and reset the AFAS. At 0424, the plant entered Mode 3.

The plant's normal shutdown procedure requires a block of the expected AFAS when securing the MFP; however, the off-normal turbine vibration procedure does not call for an anticipatory block of the AFAS when breaking condenser vacuum.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
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Callaway Plant Unit 1	0 5 0 0 0 4 8 3	12	004	000	3	OF	0 4

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

ROOT CAUSE:

The AFAS was a direct result of the 'B' MFP being secured ('A' MFP had been previously secured). The RO's deliberate tripping of the 'B' MFP satisfied the automatic ESF logic to start both motor driven Auxiliary Feedwater pumps.

The following factors contributed to the event:

1. Plant shutdown procedures did not specifically limit the time at low loads.
2. The turbine vibration off-normal procedure required breaking condenser vacuum when vibration increased to 15 mils. This appears to be overly conservative when the turbine has already been tripped and is rolling through critical speeds during its coastdown.

CORRECTIVE ACTIONS:

1. Turbine operating and coastdown data were reviewed and all bearing indications were normal. Preplanned turbine inspection will be performed during the current refueling outage.
2. Plant procedures will be revised to provide guidance for limiting operation at low power.
3. The plant off-normal procedure will be reviewed to determine if the requirement to break vacuum is overly conservative during turbine coastdown through critical speeds.

SAFETY SIGNIFICANCE:

The ESF AFAS generation equipment performed as designed in response to the 'B' MFP being secured. The two motor driven Auxiliary Feedwater pumps had already been started by the operators prior to the AFAS. There were no detrimental effects on any plant equipment as a result of the AFAS. This event had no adverse affect on the public health and safety.

PREVIOUS OCCURENCES:

LER 86-018 transmitted by ULNRC-1335, dated 6/30/86, describes a similar event in which an AFAS was initiated by the trip of 'B' MFP with the 'A' MFP secured. However, the 'B' MFP tripped on a 3 of 3 Condensate Pump trip logic after a low-low hotwell level alarm was received due to sensing line turbulence from steam sparging. In this current event, 'B' MFP was manually secured in response to a plant off-normal procedure. No corrective actions of LER 86-018 could have been expected to prevent the event of LER 92-004.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-830), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Callaway Plant Unit 1	DOCKET NUMBER (2) 0 1 5 0 0 0 4 1 8 3 9 2	LER NUMBER (6)			PAGE (3)	
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		0 1 4	0 0	0 0	0 4	OF 0 4

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

FOOTNOTES:

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

1. System - SJ, Component - P
2. System - TA, Component - TRB
3. System - AB, Component - SG
4. System - TA, Component - VA
5. System - TA, Component - SPT
6. System - SH
7. System - BA, Component - P
8. System - JE