



Callaway Plant

December 6, 1990

U. S. Nuclear Regulatory Commission  
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Washington, DC 20555

ULNRC-2335

Gentlemen:

DOCKET NUMBER 50-483  
CALLAWAY PLANT UNIT 1  
FACILITY OPERATING LICENSE NPF-30  
LICENSEE EVENT REPORT 90-014-00  
REACTOR PROTECTION SYSTEM ACTUATION AND ENGINEERED  
SAFETY FEATURE FEEDWATER ISOLATION SIGNAL DUE TO AN INSTRUMENT  
AND CONTROL TECHNICIAN INADVERTENTLY GROUNDING THE SB038  
PROTECTION SET I CABINET BACKUP POWER SUPPLY

The enclosed Licensee Event Report is submitted pursuant to  
10 CFR 50.73 (a)(2)(iv) concerning the inadvertent Reactor  
Protection System actuation and Engineered Safety Feature  
Feedwater Isolation Signal due to a utility Instrument and Control  
technician inadvertently grounding the SB038 Protection Set I  
cabinet secondary power supply.

*J. D. Blosser*  
J. D. Blosser  
Manager, Callaway Plant

JDB/TPS/JGB/djr

Enclosure

cc: Distribution attached

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LICENSEE EVENT REPORT (LER)

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.

FACILITY NAME (1) Callaway Plant Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 4 8 3	PAGE (3) 1 OF 0 5
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TITLE (4) Reactor Protection System Actuation and Engineered Safety Feature Feedwater Isolation Signal Due To An Instrument and Control Technician Inadvertently Grounding the SB038 Protection Set I Cabinet Backup Power Supply

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	1	0	6	9	0	9	0	0	0	1	4	0	0	1	2	0	6	9	0	0	5	0	0	0

OPERATING MODE (9) 4	POWER LEVEL (10) 0 0 0 0	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11)									
		20.402(b)	20.405(c)	<input checked="" type="checkbox"/>	60.73(a)(2)(iv)	73.71(b)					
		20.406(a)(1)(i)	60.36(c)(1)	<input type="checkbox"/>	60.73(a)(2)(v)	73.71(c)					
		20.406(a)(1)(ii)	60.36(c)(2)	<input type="checkbox"/>	60.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text NRC Form 306A)					
		20.406(a)(1)(iii)	60.73(a)(2)(i)	<input type="checkbox"/>	60.73(a)(2)(viii)(A)						
		20.406(a)(1)(iv)	60.73(a)(2)(ii)	<input type="checkbox"/>	60.73(a)(2)(viii)(B)						
		20.406(a)(1)(v)	60.73(a)(2)(iii)	<input type="checkbox"/>	60.73(a)(2)(ix)						

LICENSEE CONTACT FOR THIS LER (12)					
NAME K. R. Evans, Supervising Engineer, Instrument & Control				TELEPHONE NUMBER 3 1 1 4 6 1 7 1 6 - 1 8 1 6 4 5	

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
X	J I E C I A I P I		W 1 3 1 5 1 1	NO					

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	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) (16)

On 11/6/90 at 2242 CST, a Reactor Protection System (RPS) actuation and Feedwater Isolation Signal (FWIS) occurred when a utility Instrument and Control (I&C) technician inadvertently grounded the SB038 Protection Set I cabinet backup power supply while tightening a loose fuse holder on SB038 card frame 6. The plant was in Mode 4 - Hot Shutdown.

At 2215, alarms came in and cleared when the SB038 Protection Set I cabinet main power supply failed and the backup power supply picked up the load. Investigation revealed the SB038 main power supply output breaker had opened and the fuse to card frame 6 had blown. While tightening a loose fuse holder retaining nut, an I&C technician shorted the backup power supply to ground resulting in a complete loss of power to SB038. The loss of power to SB038 caused the Turbine Power/Reactor Trip Permissive to de-energize with the necessary logic met to initiate an RPS actuation and FWIS.

The cause of this event was the technician using inadequately insulated needle-nose pliers when tightening the fuse holder retaining nut. This event has been reviewed with the individual involved. The failure of the primary power supply was due to a capacitor failure in the power supply circuit of card BB-TB-412 D/G in frame 2 of SB038. The fuse holder retaining nut was tightened, BB-TB-412 D/G was replaced, and the plant resumed scheduled activities on 11/7/90 at 1717.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATIONESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS  
INFORMATION COLLECTION REQUEST: 60.0 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.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
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TEXT (If more space is required, use additional NRC Form 306A's) (17)

BASIS FOR REPORTABILITY

On 11/6/90 at 2242 CST, an inadvertent Reactor Protection System (RPS) actuation and Engineered Safety Features (1) Feedwater Isolation Signal (FWIS) occurred while troubleshooting the loss of the SB038 Protection Set I cabinet main power supply. Since these actuations were not part of a preplanned sequence during reactor operation or testing, this event is reportable per 10 CFR 50.73 (a) (2)(iv).

PLANT CONDITIONS AT TIME OF EVENT

Mode 4 - Hot Shutdown

0 percent Reactor Power

Reactor Coolant System (RCS) temperature (average) - 235 degrees F  
pressure - 415 psig

Two of four Reactor Coolant Pumps were in operation.

The feedwater isolation valves were closed.

The control rod drive motor generator sets were de-energized.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST ADD HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3160-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  Callaway Plant Unit 1	DOCKET NUMBER (2)  0 5 0 0 0 4 8 3 9 0	LER NUMBER (3)			PAGE (3)	
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TEXT (if more space is required, use additional NRC Form 306A's) (17)

DESCRIPTION OF EVENT

On 11/6/90 at 2215 CST, various alarms came in and then cleared. Alarm printouts indicated that the SB038 Protection Set I cabinet main power supply<sup>(2)</sup> had failed and the backup power supply had picked up the load. Utility Instrument and Controls (I&C) technicians investigated and found the SB038 main power supply output breaker<sup>(3)</sup> open and the fuse<sup>(4)</sup> to SB038 card frame 6 blown. I&C technicians attempted to replace the fuse but were unsuccessful due to a loose fuse holder retaining nut. The I&C supervisor and technicians decided to tighten this nut. They then insulated a pair of needle-nosed pliers prior to beginning this activity due to a concern about potential grounding. At 2242, while tightening the loose retaining nut, an I&C technician inadvertently shorted the backup power supply to ground. The short circuit caused the backup power supply fuse to blow with a complete loss of power to SB038 card frame 6. The transient caused by the loss of card frame 6 resulted in the opening of the SB038 secondary power supply output breaker and a complete loss of power to SB038. The loss of power to SB038 caused the Turbine Power/Reactor Trip Permissive (P-7) to de-energize and make up the necessary logic to open the Reactor Trip breakers on low reactor coolant flow and low pressurizer pressure. Several Main Control Board annunciators came in when SB038 was de-energized. The Reactor Trip breakers had been closed with the control rod drive motor generator sets de-energized to allow surveillance testing. The Turbine Bearing Oil Pressure Low<sup>(5)</sup> first out annunciator was already energized due to plant conditions, preventing the reactor trip first out from alarming. A review of the alarm printout and other indications subsequent to the event by the licensed Reactor Operator and Senior Reactor Operator did not immediately identify that the RPS actuation had occurred.

After discussion with the licensed Shift Supervisor, the I&C technicians energized SB038 at 2243 by re-energizing its secondary power supply and thus clearing the related annunciators. Further troubleshooting revealed that a capacitor had failed on SB038 frame 2 circuit card BB-TB-412 D/G, Westinghouse 2837A13G02, serial number 803784. The failed card was replaced and power supplies to SB038 restored to normal at 0200.

On 11/7/90 at 0530, a licensed Reactor Operator noticed, during a routine review of the Main Control Board, that the FWIS annunciator was energized. Investigating the cause of the annunciator revealed that an RPS actuation and a FWIS had been generated. The licensed operators determined the loss of power to SB038 earlier that day had caused the actuation signals. The feedwater isolation valves had been closed prior to the event. A 10CFR50.72(b)(2)(ii) notification was made at 0900. The plant resumed scheduled activities on 11/7/90 at 1717.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN FOR RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 600 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 PAP WORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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

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

ROOT CAUSE

1. The cause of this event was the failure of the I&C technician to use a sufficiently insulated set of pliers to tighten the loose fuse holder retaining nut. The pliers had been partially wrapped with electrical tape by the I&C technician.
2. The failure of the primary power supply was due to a capacitor failure in the power supply circuit of card BB-TB-4i2 D/G in frame 2 of SB038.
3. The licensed operators cognitively failed to realize, for approximately six hours, that an RPS actuation had occurred. Contributing factors included: the locked-in Turbine Bearing Oil Pressure Low red first out annunciator prevented any other annunciator associated with the RPS actuation; and the low pressurizer pressure and low flow reactor trip white annunciators cleared after SB038 was re-energized (at approximately one minute after the actuation).

CORRECTIVE ACTIONS

1. This event has been discussed with the specific individual involved and will be reviewed with utility I&C and electrical maintenance personnel.
2. An evaluation has been in progress to identify potential sources of non-conductive tools for use by utility electricians and I&C technicians when working on energized equipment. A review of the procurement and use of insulated or non-conductive tools is underway. This review and implementation of its results should significantly reduce the likelihood of similar occurrences.
3. The failed SB038 circuit card was replaced. A design change completed on 11/27/90 installed additional forced cooling air to the protection set cabinets to improve card reliability.
4. Licensed operators will review this event in licensed requalification training. The need to thoroughly review the alarm printout and all Main Control Board annunciators for this type of event will be emphasized.

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 (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.

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

- A precautionary note will be added to procedure ITM-ZZ-00017, 7300 System Power Supply Predictive Maintenance, to highlight the potential effects on the P-13/P-7 interlocks when cabinet SB038 is de-energized. The Main Control Board annunciator response procedure, OTA-RL-RK093A, Process Control System Power Failure, will be revised to include a reference to procedure ITM-ZZ-00017 for additional guidance.

SAFETY SIGNIFICANCE

At the time of the event the shutdown and control rods were fully inserted and their power supplies de-energized. The feedwater isolation valves were closed. This event posed no threat to the health and safety of the public.

PREVIOUS OCCURRENCES

None

FOOTNOTES

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

- System JE
- System JE, Component - JX
- System JE, Component - BKR
- System JE, Component - FU
- System TD, Component - ANN