UNION ELECTRIC

Callaway Plant

February 20, 1992

U. S. Nuclear Regulatory Commission
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Washington, DC 20555

ULNRC-2562

Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-30
LICENSEE EVENT REPORT 92-002-00
REACTOR TRIP ON A REACTOR COOLANT SYSTEM
LOOP LOW FLOW SIGNAL DUE TO A WORKER
INADVERTENTLY BUMPING OPEN AN INSTRUMENT VALVE

The enclosed Licensee Event Report is submitted pursuant to 10 CFR 50.73 concerning a reactor trip on Reactor Coolant System Loop 'C' low flow signal.

Blosser
J. D. Blosser
Manager, Callaway Plant

JDB/TPS/MAH/lrj

Enclosure

cc: Distribution attached

IE22
1/1

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NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

APPROVED OMB NO. 3150-0104
EXPIRES 4/30/92

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)	DOCKET NUMBER (2)	PAGE (3)
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TITLE (4) Reactor Trip On A Reactor Coolant System Loop Low Flow Signal Due To A Worker Inadvertently Bumping Open An Instrument Valve

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 5 0 0 0
0 1	2 2	9 2	9 2	— 0 0 2 —	0 0	0 2	2 0	9 2		0 5 0 0 0

OPERATING MODE (9): 1

POWER LEVEL (10): 1 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

[ ]	20.402(b)	[ ]	20.405(c)	[X]	50.73(a)(2)(iv)	[ ]	73.71(b)
[ ]	20.405(a)(1)(i)	[ ]	50.36(c)(1)	[ ]	50.73(a)(2)(v)	[ ]	73.71(c)
[ ]	20.405(a)(1)(ii)	[ ]	50.36(c)(2)	[ ]	50.73(a)(2)(vii)	[ ]	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)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (AREA CODE)
Karl R. Evans, Supervising Engineer, Instruments & Controls	3 1 4 6 7 6 - 8 6 4 5

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 (15)	MONTH	DAY	YEAR
[ ] YES (If yes, complete EXPECTED SUBMISSION DATE)	[X] NO				

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

On 1/22/92, at 1106 CST, an automatic Reactor Coolant System Loop 'C' low flow reactor trip, Auxiliary Feedwater Actuation and Feedwater Isolation occurred. The plant was in Mode 1 at 100% power at the time of the trip.

Seven utility non-licensed personnel were working on valves in containment at the time of the event. The event was caused by one of the workers in containment inadvertently bumping open the five-valve manifold high side test port isolation valve on transmitter BB-FT-436. Due to the common high pressure sensing line serving the Loop 'C' flow transmitters, the momentary flow into the cavity between the test port plug and the valve seat produced a low pressure spike in the sensing line for the transmitters, thereby initiating the reactor trip.

The plant was returned to Mode 1 - Power Operations at 1705 on 1/23/92. Corrective actions include an evaluation of methods to further visually identify to plant personnel loop flow and pressurizer pressure transmitters and their manifolds which, if disturbed, could cause a reactor trip. Additional guidelines will be established in the plant procedures for containment entries at power.

BASIS FOR REPORTABILITY:

On 1/22/92, at 1106 CST, an automatic Reactor Coolant System (RCS) Loop 'C' low flow reactor trip, Auxiliary Feedwater Actuation(1) and Feedwater Isolation occurred. This event is reportable per 10CFR 50.73(a)(2)(iv).

PLANT CONDITIONS AT TIME OF EVENT:

Mode 1 - Power Operations
100 percent reactor power
Reactor Coolant System: Temperature (average) - 589 degrees F;
Pressure - 2234 psig

DESCRIPTION OF EVENT:

On 1/22/92, at 1106 CST, an automatic RCS Loop 'C' low flow(2) reactor trip, Auxiliary Feedwater Actuation, and Feedwater Isolation occurred. Two utility engineers, two health physics technicians, two radwaste/chemistry helpers and an equipment operator were in containment at the time of the event performing routine maintenance and inspection. This group was in the vicinity of the three RCS Loop 'C' flow differential pressure transmitters and five-valve manifolds.

A team went into containment following the event to investigate how the two out of three logic trip signal was generated, since the signal was of such a short duration that the plant computer did not indicate which specific transmitters on Loop 'C' caused the trip. Based on the belief that personnel in the area had somehow caused a perturbation in one of the low flow transmitters, attempts were made to reproduce the trip signal by physically shaking the transmitters and sensing lines. No significant signal spikes were generated in this manner. Troubleshooting was conducted on the instrument racks during which time a loop supply card was discovered supplying 18 volts, as compared to the normal 30-40 volts. An analog channel operational test of the instrument rack was performed. No deficiencies were identified that could have caused a partial or reactor trip signal. Subsequent evaluations indicate the most likely cause of the event may have been personnel inadvertently bumping a valve on one of the RCS Loop 'C' five-valve manifolds.

Each five-valve manifold(3) consists of one set of high and low side test port isolation valves, one set of high and low pressure process isolation valves, and one equalization valve. The test port isolation valves are located at knee level, such that they could have been bumped by a nearby worker or by test equipment being carried by a worker. The high pressure process sensing line is a common connection between the three RCS Loop 'C' transmitters(4). When the high side test port isolation valve is opened, a small cavity within the five-valve manifold plug fills between the test port plug and the valve seat. The rapid filling of the cavity with water at 2200 psig can create a momentary pressure drop in the common line leading to all of the transmitters. To evaluate this possible cause, a team entered containment to duplicate this spike by cracking open the high side test port isolation valve on BB-FT-434. A sharp spike appeared on all three of the Loop 'C' control room flow indicators and a partial trip signal was generated. When the team came to BB-FT-436, they found that the high side test port isolation valve was already open 1/16 of a turn, and no spike resulted from further opening this valve. The plant was returned to Mode 1-Power Operations at 1705 on 1/23/92.

ROOT CAUSE:

This event was caused by one of the workers in containment inadvertently bumping open the five-valve manifold high side test port isolation valve on transmitter BB-FT-436. Due to the common high pressure sensing line serving the three Loop 'C' flow transmitters, the momentary flow into the cavity between the test port plug and the valve seat produced a low pressure spike in the sensing lines for the flow transmitters, thereby initiating the reactor trip.

Contributing factors included the lack of adequate caution on the part of the personnel involved and lack of programmatic barriers to warn personnel of the potential consequences of disturbing this equipment.

CORRECTIVE ACTIONS

1. The twelve transmitters and five-valve manifolds associated with the loop flows and the two transmitters and valve manifolds for pressurizer pressure, which share a common tap, will be visually marked to warn personnel that a disturbance of this equipment could lead to a reactor trip. This event will be utilized in future training for plant personnel to heighten their sensitivity to the potential consequences of inadvertent manipulation of plant equipment.

2. Additional guidelines will be established in the plant procedure for containment entries at power. A briefing will be performed to include a warning of the potential to trip the plant if certain components are disturbed.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

SAFETY SIGNIFICANCE:

This reactor trip was caused by a s,urious low flow signal. An actual RCS low flow condition never existed. All plant safety systems performed as required. There was no detrimental effect on plant equipment as a result of the actuations, therefore there was no threat to the public health and safety.

PREVIOUS OCCURRENCES

LER 86-030-01, transmitted on 8/07/87, via ULNRC-1564.

An automatic RCS Loop 'B' low flow reactor trip occurred while restoring flow transmitter BB-FT-424 to service following its replacement. The root cause of this event was failure of the five-valve manifold equalization valve to fully seat during performance of the flow transmitter restoration procedure. Due to the common high pressure sensing line serving the Loop 'B' flow transmitters, leakage through the equalization valve produced a low pressure drop across the remaining two inservice flow transmitters initiating the reactor trip signal.

The event involved a leaking manifold affecting the common high pressure sensing line. A task force was formed as a part of the corrective action to resolve the common tap instrumentation problem. The investigation included: transmitter reliability, improvement of five-valve manifolds and improvement of procedures. An inadvertent bump of the test port isolation valves by a worker with a resulting reactor trip was not anticipated.

FOOTNOTES:

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

1. System - JC
2. System - AB
3. System - AB, Component - V
4. System - AB, Component - PDT