

April 11, 2001

U. S. Nuclear Regulatory Commission  
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ULNRC-4443

Gentlemen:

**DOCKET NUMBER 50-483**  
**UNION ELECTRIC CO.**  
**LICENSEE EVENT REPORT 2001-002-00**  
**Foreign object renders 'B' Essential Service Water Pump Inoperable.**

The enclosed licensee event report is submitted in accordance with 10CFR50.73(a)(2)(i)(B) to report an operation/condition prohibited by Technical Specifications and exceeding Allowed Outage Time, and 10CFR50.73(a)(2)(v)(B) to report an event/condition that could have prevented fulfillment of a Safety Function, characterized by the loss of Residual Heat Removal and the loss of Containment Coolers.

*Warren A. Witt*  
Warren A. Witt  
Manager, Callaway Plant

WAW/tmw

Enclosure

IE22



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## LICENSEE EVENT REPORT (LER)

(See reverse for required number of  
digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to [bjr1@nrc.gov](mailto:bjr1@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

<b>FACILITY NAME (1)</b> <b>Callaway Plant Unit 1</b>				<b>DOCKET NUMBER (2)</b> <b>05000</b>				<b>PAGE (3)</b> <b>1 OF 5</b>						
<b>TITLE (4)</b> Foreign object renders 'B' Essential Service Water pump Inoperable.														
<b>EVENT DATE (5)</b>			<b>LER NUMBER (6)</b>			<b>REPORT DATE (7)</b>			<b>OTHER FACILITIES INVOLVED (8)</b>					
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER				
02	14	01	2001	002	00	04	11	01		05000				
									FACILITY NAME	DOCKET NUMBER				
										05000				
<b>OPERATING MODE (9)</b>		<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)</b>												
1		20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)						
<b>POWER LEVEL (10)</b>		100												
		20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)						
		20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)						
		20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)						
		20.2203(a)(2)(ii)		50.36(c)(2)		X 50.73(a)(2)(v)(B)		<b>OTHER</b> Specify in Abstract below or in NRC Form 366A						
		20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)								
		20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)								
		20.2203(a)(2)(v)		X 50.73(a)(2)(i)(B)		50.73(a)(2)(vii)								
		20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)								
		20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)								
<b>LICENSEE CONTACT FOR THIS LER (12)</b>														
NAME M. A. Reidmeyer, Supervisor, Regional Regulatory Affairs								TELEPHONE NUMBER (Include Area Code) (573)676-4306						
<b>COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)</b>														
CAUSE	SYSTEM	COMPONENT	MANU- FACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANU- FACTURER	REPORTABLE TO EPIX				
<b>SUPPLEMENTAL REPORT EXPECTED (14)</b>								<b>EXPECTED SUBMISSION DATE (15)</b>		MONTH	DAY	YEAR		
YES (If yes, complete EXPECTED SUBMISSION DATE).								X		NO				
<b>ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)</b>														
<p>At 0851, on 2/14/01, with the Plant in Mode 1 at 100 percent Reactor Power, the 'B' Essential Service Water (ESW) pump was started to support performance of a surveillance procedure. Upon starting, the pump experienced low discharge pressure and flow. The pump was secured and declared Inoperable, which also rendered the 'B' Emergency Diesel Generator, 'B' Containment (CTMT) Spray pump and 'B' train CTMT coolers Inoperable. The 'C' CTMT cooler was also Inoperable as part of scheduled 'A' train work. At 0851, with 'A' and 'B' train CTMT coolers plus the 'B' CTMT Spray pump Inoperable, the Plant met Technical Specification (T/S) 3.0.3 conditions. 'C' CTMT Cooler was restored to Operable at 1123 and T/S 3.0.3 was exited. Subsequently, pump inspection revealed a tygon hose in the pump suction. The hose was removed and the pump was declared Operable at 0231, 2/15/01. Further review of the incident determined that the system had been Inoperable since 1415, 2/9/01. A review of work performed from 1415, 2/9/01 to 0231, 2/15/01 revealed that the Plant had unknowingly entered T/S 3.0.3 four additional times. The root cause of the event was loss of pump function due to foreign material. Corrective actions include foreign material program enhancement.</p>														

**LICENSEE EVENT REPORT (LER)**

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Callaway Plant Unit 1	05000	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2	O F	5
		2001	- 002 -	00			

**NARRATIVE** (If more space is required, use additional copies of NRC Form 366A) (17)

**I. DESCRIPTION OF THE REPORTABLE EVENT**

**A. REPORTABLE EVENT CLASSIFICATION**

This Licensee Event Report is submitted as a violation of conditions prohibited by plant Technical Specifications (T/S) pursuant to the requirements of 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(v)(B). The 10CFR50.73(a)(2)(i)(B) violation consists of two items, exceeding Allowed Outage Time (AOT) and operation/condition prohibited by T/S 3.7.8 Action 'A' and 3.0.3. These instances are characterized by entering various T/S Actions and exceeding the time allowed in the Action statements. The 10CFR50.73(a)(2)(v)(B) violation consists of an event/condition that could have prevented fulfillment of a Safety Function. It is characterized by the loss of Residual Heat Removal and Containment cooler functions during this event.

**B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT**

On 2/14/01, when this event occurred, the Callaway Plant was in Mode 1 operating at 100 percent Reactor power.

**C. STATUS OF STRUCTURES, SYSTEMS OR COMPONENTS THAT WERE INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO THE EVENT**

On 2/14/01, when this event occurred, the 'C' Containment cooler was Inoperable for planned maintenance.

**D. NARRATIVE SUMMARY OF THE EVENT, INCLUDING DATES AND APPROXIMATE TIMES**

At 1415, 2/9/01, a leak collection rig was installed on the 'B' Essential Service Water (ESW) prelube tank by an AM shift plant helper. The rig consisted of a funnel with a long section of tygon hose attached to direct leakage to the pump bay through an open floor penetration. At 1635, a Non-Licensed Operator (NLO) performing rounds noticed the funnel installed, but without a drain hose attached. A PM shift plant helper was directed to install a hose on the funnel. The PM shift plant helper and the NLO were unaware that a hose had previously been installed during the AM shift.

At 0507, 2/14/01, the on-shift Operating crew removed the 'C' Containment (CTMT) cooler from service as part of the scheduled 'A' Train work and declared it Inoperable. At 0851, the on-shift crew started 'B' ESW pump to support the performance of 'A' train surveillance testing. A Licensed Operator (LO) observed the pressure and flow to be below normal and the pump was secured. The 'B' ESW pump was declared Inoperable as of 0851, and the plant entered T/S 3.7.8.A (one ESW train Inoperable), 3.8.1.B (one diesel generator Inoperable) and 3.6.6.D (two CTMT cooling trains Inoperable). This also rendered the 'B' CTMT Spray pump Inoperable because its' respective room cooler was Inoperable. With 'C' CTMT cooler, 'B' train CTMT coolers and 'B' CTMT Spray pump Inoperable, Callaway satisfied conditions to enter T/S 3.0.3 Action statement as specified by T/S 3.6.6.F.

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**NARRATIVE** (If more space is required, use additional copies of NRC Form 366A) (17)

**D. NARRATIVE (CONTINUED)**

At approximately 0920 the Control Room initiated actions to restore 'C' CTMT cooler to service.

At 0943, the crew completed the One-Hour Off-Site Source Verification per T/S 3.8.1.B

At 1115, the Control Room confirmed T/S 3.0.3 conditions were met and declared that T/S 3.0.3 had been entered at 0851. At 1123, the Control Room completed restoration of 'C' CTMT cooler and exited T/S 3.0.3 and 3.6.6.D.

Investigation by a diver revealed a 20 foot section of 1 ¼ inch tygon reinforced hose caught in the pump suction bell of the first stage impeller on 'B' ESW pump. After extracting the hose and determining that no further foreign material was in the pump suction, the pump was started. Pump parameters were verified within allowable specifications. At 0231, 2/15/01, the 'B' ESW pump was declared Operable and T/S 3.7.8.A and 3.8.1.B were exited.

It was determined that the hose had fallen into the pump bay on 2/9/01, sometime between 1415 when the hose was installed and 1635 when the NLO noticed there was no hose attached to the funnel and informed the Control Room staff. Assuming the worst case scenario of the hose coming loose and falling into the bay at 1415, 2/9/01, the 'B' ESW train and its associated 'B' Emergency Diesel Generator had been Inoperable since 1415, 2/9/01. This assumption was based upon the fact that almost immediately after starting, the pump experienced reductions in flow and discharge pressure due to the tygon hose being drawn into the suction. After reviewing all work documents performed during the time frame of 1415, 2/9/01, until 0231, 2/15/01, it was determined that there were four (4) other instances when equipment was made Inoperable and T/S Action statement time limits were exceeded. The instances are listed below in chronological order:

<u>DATE/TIME</u>	<u>EVENT</u>	<u>TECHNICAL SPECIFICATION</u>
1) 2/12/01 0051-0053	'A' ESW flow was isolated to CTMT coolers	3.0.3 was applicable for 2 min
2) 2/12/01 0923-1405	'A' Class 1E Elec. Equip. A/C unit Inoperable	3.0.3 applicable per ODP-ZZ-00002 for action with 2 Class 1E A/C units Inoperable for 4 hr 42 min.
3) 2/13/01 0953-1122	'A' Residual Heat Removal train Inoperable while adding Hydrazine	3.0.3 with two Emergency Core Cooling Systems (ECCS) Inoperable for 1 hr. 29 min.
4) 2/13/01 1233-1311	'A' Safety Injection pump Inoperable due to repairs to pump room cooler.	3.0.3 with two ECCS Inoperable for 38 min.

Based upon the above listed instances, Callaway unknowingly entered T/S 3.0.3 four additional times.

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**NARRATIVE** (If more space is required, use additional copies of NRC Form 366A) (17)

**E. METHOD OF DISCOVERY OF EACH COMPONENT, SYSTEM FAILURE OR PROCEDURAL ERROR**

The Inoperability of the 'B' ESW pump was discovered when the pump was started and the foreign material was drawn into the pump suction.

**II. EVENT DRIVEN INFORMATION**

**A. SAFETY SYSTEMS THAT RESPONDED**

Not applicable: there were no safety system responses associated with this event.

**B. DURATION OF SAFETY SYSTEM INOPERABILITY**

The length of time the 'B' ESW train was Inoperable was from 1415, 2/9/01 until 0231, 2/15/01, for a total time of 132 hours 16 minutes.

**C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT**

Due to foreign material entering the pump bay undetected at 1415, 2/9/01, and rendering the 'B' ESW train Inoperable, Callaway entered T/S 3.0.3 five (5) different times before the problem was corrected and the pump returned to Operable status at 0231, 2/15/01.

The incremental conditional core damage probability (ICCDP) attributable to this event is 2.32 E-6. This ICCDP value is based, in part, on the entire time period that 'B' ESW Pump was affected by the tygon hose. The ICCDP does not take credit for the 72-hour completion time allowed in T/S 3.7.8.A. The ICCDP value also assumes mean equipment test and maintenance unavailabilities, as opposed to actual equipment test/maintenance configurations that were entered into while 'B' ESW Pump was affected.

**III. CAUSE OF THE EVENT**

There were two root causes for the ESW event. 1) The drain hose was not adequately secured to prevent the hose from entering the pump bay. 2) Insufficient questioning of what happened to the initial hose installed at 1415, 2/9/01. Inadequate communication between the AM and PM plant helpers and between the Plant Helper work group and Operations contributed to the insufficient response to the situation.

The root cause for the noncompliance with T/S 3.0.3 was due to the inability to restore the 'C' CTMT Cooler within one hour and difficulty the On-shift Licensed Operators had in using the Safety Function Determination Program (SFDP) to quickly verify that T/S 3.0.3 had been entered.

**IV. CORRECTIVE ACTIONS**

**A. HUMAN PERFORMANCE**

The Plant Helper department has discussed this event with the work force to promote a questioning attitude, and has discussed this with the individuals involved. In addition, a leak collection device installation log is being established to track collection devices installed in the plant. Plant Helper Supervisors now review the potential for dropped FME items as part of pre-job briefs for work in the ESW pump rooms.

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**B. PROCEDURE DEFICIENCY**

A revision to Safety Function Determination Program procedure was issued on 3/12/01 and includes changes to Attachment 3 to help identify Containment Spray as a system affected by a loss of ESW.

**V. PREVIOUS SIMILAR EVENTS**

There were no similar LER occurrences within the past three years.

A review of the Callaway Action Request System (CARS) for the past three years revealed that Callaway has experienced a similar Foreign Material occurrence. In CARS 199800301, a 3/4 x 3/4 x 1 inch steel pin dropped through the same 6-inch floor penetration that the hose in this LER passed through. There was no impact on operability or pump performance.

**VI. ADDITIONAL INFORMATION**

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

System: BI

Component: P