

January 10, 2000

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Stop P1-137  
Washington, DC 20555-0001

ULNRC-4173


Gentlemen:



**DOCKET NUMBER 50-483  
CALLAWAY PLANT UNIT 1  
UNION ELECTRIC CO.  
FACILITY OPERATING LICENSE NPF-30  
LICENSEE EVENT REPORT 99-009-01  
RCS Leakage Detection Systems are Outside of Design Basis  
Because a 1 gpm Leak Can Not be Detected Within 1 Hour**

The enclosed licensee event report is submitted in accordance with 10CFR50.73(a)(2)(ii)(B) to report a condition that was outside the design basis of the plant.

This is being resubmitted to clarify that Callaway was performing evaluations regarding applicability to the site between the time of initial identification by Wolf Creek on 12/2/99, and the time that Callaway concluded that facility was potentially outside of its design basis on 12/3/99. We hope this clarification will not create any inconvenience.

  
R. D. Affolter  
Manager, Callaway Plant

RDA/JDS/gag

Enclosure

JED2

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# LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>Callaway Plant Unit 1</b>	DOCKET NUMBER (2) 0   5   0   0   0   4   8   3	PAGE (3) 1   OF   3
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TITLE (4) **RCS Leakage Detection Systems are Outside of Design Basis Because a 1 gpm Leak Can Not be Detected Within 1 Hour**

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)																				
1	2	0	3	9	9	9	9	-	0	0	9	-	0	1	0	1	0	1	1	0	0	0	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"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)							
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(x)							
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	73.71							
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iv)	OTHER (Specify in Abstract below or in Text, NRC Form 366A)							
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)								
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)								

**LICENSEE CONTACT FOR THIS LER (12)**

NAME	TELEPHONE NUMBER
J. D. Schnack, Supervising Engineer, QA Corrective Action Group	AREA CODE
	5   7   3   6   7   6   -   4   3   1   9

**COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)**

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

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)**

At 1200 CST on 12/3/99, it was identified that the Containment Normal Sump Level Measurement System and Containment Air Cooler Condensate Flow Rate System may not be capable of performing their design function because they could not in all cases detect a 1 gpm leak within 1 hour. This design basis requirement, which is described within the plant's Final Safety Analysis Report, is derived from Regulatory Guide 1.45. These systems are part of the Reactor Coolant System Leakage Detection Systems required by Technical Specifications. They calculate leakage rates by converting a change in sump or standpipe level to gallons, and then dividing this value by the time interval between pump runs or cycling of the standpipe drain valve. If a leak occurs following a long period of little or no leakage, initial calculated leak rates may be low due to the relatively large amount of time between pump runs/valve cycling. Therefore, a 1 gpm leak may not be detected within the 1 hour requirement.

The root cause of this event was attributed to a design error from plant startup. Software revisions to the leak detection program were implemented to correct this error and procedures for manually calculating these leakage rates were revised to reflect the revised methodology. Calculations that use similar time-dependent methodology are being reviewed to ensure that similar errors do not exist.

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

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		YEAR 9   9	SEQUENTIAL NUMBER -   0   0   9	REV NO. -   0   1			
					0   2	OF	0   3

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

**DESCRIPTION OF EVENT:**

At 1430 CST on 12/2/99, Wolf Creek informed Callaway that they had identified that the Containment Normal Sump Level Measurement System<sup>(1,2)</sup> and Containment Air Cooler Condensate Flow Rate System<sup>(1)</sup> may not be capable of performing their design function because they could not in all cases detect a 1 gpm leak within 1 hour. These systems are required per Technical Specification 3.4.6.1 b & c as Reactor Coolant System (RCS) Leakage Detection Systems. The Final Safety Analysis Report (FSAR) states that these systems meet General Design Criteria 30 (Quality of Reactor Coolant Pressure Boundary) and the requirements of Regulatory Guide 1.45 (Reactor Coolant Pressure Boundary Leakage Detection Systems). These documents require the leakage detection system to be able to detect a 1 gpm leak within 1 hour. Callaway personnel evaluated this issue for applicability to Callaway, and determined at 1200 CST on 12/3/99 that the Containment Normal Sump Level Measurement System and Containment Air Cooler Condensate Flow Rate System may not be capable of performing their design function because they could not in all cases detect a 1 gpm leak within 1 hour. Since Callaway was potentially outside of its design bases, a 1 hour phone call was made to the NRC at 1244 CST on 12/3/99 per 10CFR50.72(b)(1)(ii)B.

The Containment Normal Sump Level Measurement System and Containment Air Cooler Condensate Flow Rate System measures changes in sump or standpipe level, converts this change in level to gallons, then divides by the amount of time since the pump stopped or the valve closed to determine leakage rate. The time is currently reset when the pumps turn off or the valves close following pumping down the sumps<sup>(2)</sup> or draining the standpipe. If a leak occurred after there has been a long period of little or no leakage, the calculated leak rate could be low because the time by which the change in sump level is divided, becomes a large number. This may have prevented a 1 gpm leak from being detected within 1 hour.

**BASIS FOR REPORTABILITY:**

These events are reportable per 10CFR50.73(a)(2)(ii)(B) as a condition that was outside the design basis of the plant.

**CONDITION AT TIME OF EVENT:**

Mode 1, Power Operations - 100% power

**ROOT CAUSE:**

The root cause of this event was attributed to a design error from plant startup. In 1997, this issue was identified and software changes to fix this error were initiated. Due to personnel oversight, the software changes were not completed in a timely manner and this item was not identified as being reportable when the deficiency was discovered.

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		YEAR 9   9	SEQUENTIAL NUMBER -   0   0   9	REV NO. -   0   1	0   3	OF	0   3

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

**CORRECTIVE ACTIONS:**

To correct the design error, changes to the leak rate program were implemented via software revisions on 12/08/99. These changes ensure that a 1 gpm leak can be detected within 1 hour. In addition, Operations procedures have been revised to reflect the new calculation methodology. To assure that similar design errors do not exist in the Plant Computer, a review of calculations that use similar time-dependent methodology is being performed.

This event will be reviewed with Engineering and Quality Assurance staff to heighten awareness of corrective action program requirements to perform timely corrective actions and reportability reviews. Further causal analysis is being performed to identify additional corrective action to address human performance concerns.

**SAFETY SIGNIFICANCE:**

Other RCS leakage detection systems (Containment Atmosphere Particulate Radioactivity Monitoring System and Containment Atmosphere Gaseous Radioactivity Monitoring System) were not affected by the design error and were capable of identifying a 1 gpm leak within 1 hour.

Based on conservative calculations, the Containment Normal Sump Level Measurement System was capable of identifying a 4.3 gpm leak within 1 hour. The Containment Air Cooler Condensate Flow Rate System was capable of identifying a 1.26 gpm leak within 1 hour. These values are well within the capabilities of the Reactor Makeup System.

Therefore, this event did not pose a threat to public health and safety.

**PREVIOUS OCCURRENCES:**

None

**FOOTNOTES:**

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

- (1) System - ID, Component - CPU
- (2) System - IJ, Component - DRN