

March 14, 2006

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

ULNRC05261



Ladies and Gentlemen:

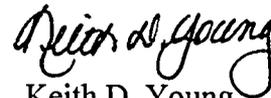
**DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC CO.
FACILITY OPERATING LICENSE NPF-30
LICENSEE EVENT REPORT 2006-001-00**

Pressurizer Porv Stroke Time and other delays Exceed Times assumed in COMS Analyses

The enclosed licensee event report is submitted in accordance with 10CFR50.73(a)(2)(i)(B) to report a violation of Technical Specifications when the pressurized PORV stroke times were not conservative to times in the Cold Overpressure Mitigating Systems Analysis.

This letter does not contain new commitments.

Sincerely,


Keith D. Young
Manager,
Regulatory Affairs


KAM/CSP/slk
Enclosure
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 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 and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@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 an 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.

1. FACILITY NAME Callaway Plant Unit 1	2. DOCKET NUMBER 05000 483	3. PAGE 1 OF 7
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4. TITLE
PRESSURIZER PORV STROKE TIME AND OTHER DELAYS EXCEED TIMES ASSUMED IN COMS ANALYSES

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	14	2005	2006	- 001 -	00	03	14	2006	None	
									FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 4	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)									
10. POWER LEVEL 0	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER							
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A							

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME K.A. Mills, Supervising Engr Safety Analyses/Regional Regulatory Affairs	TELEPHONE NUMBER (Include Area Code) (573) 676-4317
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

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

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE)	<input type="checkbox"/> NO			

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

During testing on 11/14/2005 the pressurizer Power Operated Relief Valves (PORVs), BBPCV0455A and BBPCV0456A, initially closed slower than the maximum stroke time allowed (2 seconds) in the test procedure. The open stroke time for both valves were within procedure limits. Subsequent review of the basis for the stroke time values indicated that the limits in the procedure were not conservative with respect to the maximum allowed stroke times credited in the Callaway Analyses of Record (AOR) for a Cold Overpressure Mitigating System (COMS) function.

The analyses for COMS assumes an opening time and delay time for the pressurizer PORVs. Evaluations have determined that PORV stroke times measured during surveillance testing did not account for all of the delay times credited in the Design Bases COMS AOR. Further reviews determined the allowed delay times could not be met by the control loop. This results in PORV stroke times which are non-conservative to the COMS AOR.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
Callaway Plant Unit 1	05000483	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 7
		2006	- 001	- 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 event is being reported criterion: 10CFR50.73(a)(2)(i)(B), an operation or condition prohibited by Technical Specifications.

B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

Plant was in MODE 4 with temperature > 275 degrees F. at the time the stroke test was performed. The plant was in Mode 1 at the time the determination was made.

TS 3.4.12, Cold Overpressure Mitigating System (COMS) is applicable in Mode 4 with RCS temperature less than or equal to 275F, Mode 5 and Mode 6 with the head on the reactor vessel.

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

Not applicable for this event.

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

During testing on 11/14/2005 the pressurizer Power Operated Relief Valves (PORVs), BBPCV0455A and BBPCV0456A, initially closed slower than the maximum stroke time allowed (2 seconds) in the test procedure. The open stroke time for both valves were within procedure limits. Subsequent review by engineering of the basis for the stroke time values indicated that the limits in the procedure were not conservative with respect to the maximum allowed stroke times credited in the Callaway Analyses of Record (AOR) for a Cold Overpressure Mitigating System (COMS) function.

The analyses for COMS assumes an opening time and delay time for the pressurizer PORVs. Evaluations performed by Callaway engineering personnel have determined that PORV stroke times measured during surveillance testing did not account for all of the delay times credited in the Design Bases COMS Analyses of Record. Further reviews determined the allowed delay times could not be met by the control loop. This results in PORV stroke times which are non-conservative to the COMS AOR This was reported to the NRC on ENS# 42257 on 01/13/2006. It was entered into the plant corrective action system as CAR 200509374.

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The event was conservatively reported under 10CFR50.73(a)(2)(v), event or condition that could have prevented fulfillment of a safety function. Specifically items (C) and (D) - control or radiation releases and mitigate the consequences of an accident. Further reviews (see below section II.C., SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT) indicate there is reasonable expectation of fulfillment of the COMS function. Since it is reasonable that the function will be fulfilled and COMS is not considered in the FSAR chapter 15 accident analyses, we no longer consider this event reportable under 10CFR50.72(b)(v)(C), 10CFR50.72(b)(v)(D), or 10CFR50.73(a)(2)(v)(C) or 10CFR50.73(a)(2)(v)(D).

At the time the determination was made, the plant was in Mode 1. TS 3.4.12, COMS, is applicable in Mode 4 with RCS temperature less than or equal to 275F, Mode 5 and Mode 6 with the head on the reactor vessel. To meet the COMS requirements, TS 3.4.12 allows using the pressurizer PORVs, Residual Heat Removal (RHR) system suction relief valves, a combination of PORVs and RHR suction relief valves, or the reactor coolant system (RCS) depressurized with a RCS vent ≥ 2.0 square inches.

Based upon the non-conservative stroke time criteria contained in the test procedure, conservatively the pressurizer PORVs were not operable for COMS purposes during the timeframes listed below in section II.B., Duration of Safety System Unavailability.

The preoperational test procedure for the pressurizer PORVs verified the PORV open stroke time. The stroke time requirement was ≤ 2 seconds. In the 1983-1984 timeframe, Callaway Inservice Test Program (IST) established maximum allowable stroke time of 2 seconds. This stroke time was chosen based upon the Westinghouse/SNUPPS PIP (SNUPPS: Standardized Nuclear Unit Power Plant System) (PIP: Project Information Package). The stroke time allowed in plant procedures has remained consistent since that time.

Various analyses, correspondence and design documents going back to 1983 have the following PORV stroke times for the COMS function: signal delay time of 0.85 seconds, valve opening time of 0.85 seconds. The valve closing time has varied in the range of 1.05 - 1.75 seconds.

Additional analyses were performed after the stroke times were measured on 11/14/2005. The analyses showed that no change would be needed to the COMS related PTLR curves if the following times could be met:

Open stroke time: 1.9 seconds (0.7 seconds delay, 1.2 seconds stroke)
Close stroke time: 2.6 seconds (0.7 seconds delay, 1.9 seconds stroke)

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The measured stroke times for the pressurizer PORVs on 11/14/2005 were:

BBPCVD455A	Test 1:	Open 1.2 seconds,	Close 2.2 seconds
BBPCVD455A	Test 2:	Open 1.6 seconds,	Close 1.5 seconds
BBPCVD455A	Test 3:	Open - seconds,	Close 1.3 seconds
BBPCVD456A	Test 1:	Open 0.5 seconds,	Close 2.1 seconds
BBPCVD456A	Test 2:	Open 0.6 seconds,	Close 1.6 seconds
BBPCVD456A	Test 3:	Open - seconds,	Close 1.3 seconds

Review of past test results for the past three years, show the final valve opening times were within 1.6 seconds and closure times were within 2.3 seconds.

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

PORV stroke time was discovered by an inservice test program surveillance. The non-conservative test procedure stroke time criteria was discovered by engineering and vendor review of the COMS calculations.

II. EVENT DRIVEN INFORMATION

A. SAFETY SYSTEMS THAT RESPONDED

Not applicable for this event.

B. DURATION OF SAFETY SYSTEM INOPERABILITY

TS 3.4.12, COMS, is applicable in Mode 4 with RCS temperature less than or equal to 275F, Mode 5 and Mode 6 with the head on the reactor vessel. To meet the COMS requirements, TS 3.4.12 allows using the pressurizer PORVs, Residual Heat Removal (RHR) system suction relief valves, a combination of PORVs and RHR suction relief valves, or the reactor coolant system (RCS) depressurized with a RCS vent ≥ 2.0 square inches.

The affected equipment is the pressurizer PORVs when used for COMS function. Their function at normal RCS operating conditions is not affected.

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COMS TS Applicable Timeframes (3 year history)

Start:	Stop	Comment
10/23/2002 1452	10/28/2002 0720	Refuel 12 Cooldown
11/14/2002 1502	11/21/2002 0554	Refuel 12 Heatup
03/22/2003 0034	03/31/2003 0557	March 2003 outage
04/10/2004 1946	04/19/2004 0344	Refuel 13 Cooldown
05/16/2004 0312	06/07/2004 0514	Refuel 13 Heatup
09/17/2005 1635	09/22/2005 1713	Refuel 14 Cooldown
11/03/2005 0421	11/13/2005 1735	Refuel 14 Heatup

Timeframes for potential non-compliance with TS 3.4.12:

Timeframe	COMS By
10/23/2002 1452 - 10/26/2002 0206	2 PZR PORVs
11/17/2002 0042 - 11/19/2002 0116	1 PZR PORV and 1 RHR suction relief
11/19/2002 0153 - 11/21/2002 0244	1 PZR PORV and 1 RHR suction relief
11/21/2002 0244 - 11/21/2002 0544	2 PZR PORVs
03/22/2003 0034 - 03/24/2003 0022	2 PZR PORVs
03/27/2003 2210 - 03/31/2003 0557	1 PZR PORV and 1 RHR suction relief
04/10/2004 1946 - 04/19/2004 0344	2 PZR PORVs
05/23/2004 0052 - 05/24/2004 2308	2 PZR PORVs
05/24/2004 2308 - 05/26/2004 0007	1 PZR PORV and 1 RHR suction relief
05/26/2004 0007 - 05/28/2004 0919	2 PZR PORVs
05/28/2004 0919 - 05/28/2004 1025	1 PZR PORV and 1 RHR suction relief
05/28/2004 1025 - 05/29/2004 0143	2 PZR PORVs
06/01/2004 0025 - 06/06/2004 0514	2 PZR PORVs
09/17/2005 1635 - 09/18/2005 1737	2 PZR PORVs
09/18/2005 1737 - 09/22/2005 1713	1 PZR PORV and 1 RHR suction relief
11/08/2005 0433 - 11/09/2005 1143	2 PZR PORVs
11/09/2005 1143 - 11/09/2005 1502	1 PZR PORV and 1 RHR suction relief
11/09/2005 1502 - 11/13/2005 1735	2 PZR PORVs

The above dates and times were taken from control room narrative logs, watch relief checklists, plant computer data, and work control system data.

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C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT.

(Information was extracted from the root cause evaluation for CAR 200509374).

This issue has a low safety / risk significance. Stroke time for the Pressurizer PORVs is not modeled in the FSAR Chapter 15 analyses. The PRA analyses do not model the plant when Cold Overpressure Mitigation System (COMS) is required.

Westinghouse Letter SCP 88-111 provides pressure versus time data for the most limiting mass and heat injection events. During the time period just prior to PORV opening, pressure increases at an approximate rate of 22 psi/sec. The additional stroke time evaluated is less than 0.5 seconds, therefore an additional pressure increase of approximately eleven psi could have occurred. Technical Specification Bases, B 3.4.12 states "Exceeding the RCS P/T limits by a significant amount could cause brittle cracking of the reactor vessel." Eleven psi is not considered significant.

The analysis includes assumptions which also qualitatively allow this potential pressure increase. These include:

- Safety Factor of 2 for primary stresses
- Assumes an initial flaw equal to 1/4 the reactor vessel wall thickness. Actual NDE techniques detect smaller flaws.
- Conservative mass and heat injection rates.

III. CAUSE(S) OF THE EVENT AND CORRECTIVE ACTION(S)

(Information was extracted from the root cause evaluation for CAR 200509374).

The immediate action taken to address this issue was to declare BBPCV0455A and BBPCV0456A inoperable. A second surveillance test was performed on these valves and the closing stroke times were within the 2 second maximum stroke time. An analysis of the stroke time deviation was performed by engineering and the valves were determined to be operable per Technical Specification 5.5.8 related functions, but not for Technical Specification 3.4.12 COMS functions.

Engineering in conjunction with Westinghouse, will change the current stroke time analysis to allow operations to use the PORVs for COMS per Technical Specification 3.4.12.

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Two compensatory actions were implemented as part of the Operability Determination completed for CARS 200509374. Administrative controls, in the form of a Night Order, were put in place to assure COMS credit is not taken for TS Limiting Condition of Operation (LCO) 3.4.12.a and 3.4.12.c. Both LCOs take credit for the Pressurizer PORVs for RCS pressure relief. The second compensatory action was a revision to the Callaway Plant Emergency Operation Procedures (EOPs) that credit operation of COMS. These EOPs now include steps to ensure temperature is maintained above the COMS initiation temperature before RHR is placed into service. These compensatory actions are not considered the solution to the issue of inadequate COMS setpoints and are therefore considered temporary until new COMS curves can be put into service.

The root cause of the event is inadequate communication between the Design Engineering and Inservice Test Engineering groups with regard to changes made to the curve book. This breakdown of communications occurred several times in the period between Callaway Plant startup and the Replacement Steam Generator design review performed in 2003.

Engineering's procedures and the form for evaluating changes to the curve book will be revised to include instructions to communicate curve book changes with the affected groups and to communicate adequate controls to ensure impact on other plant programs and departments is considered.

IV. PREVIOUS SIMILAR EVENTS

None

V. ADDITIONAL INFORMATION

None