



December 7, 1992

U. S. Nuclear Regulatory Commission
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ULNRC-2733

Gentlemen:

**DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-36
VOLUNTARY LICENSEE EVENT REPORT 92-012-00
ESSENTIAL SERVICE WATER VALVE MAINTENANCE ERROR**

The enclosed Licensee Event Report is submitted voluntarily to discuss the operability, causes and corrective actions for the 'B' ESW train being declared inoperable and subsequently operable.

A handwritten signature in cursive script that reads "W. R. Campbell".

W. R. Campbell
Manager, Callaway Plant

WRC/SES/MNF/lrj

Enclosure

cc: Distribution attached

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1/1

cc distribution for ULNRC-2733

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LICENSEE EVENT REPORT (LER)

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TITLE (4) **Essential Service Water Valve Maintenance Error**

EVENT DATE (6)			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)
0 4	0 9	9 2	9 2	0 1 2	0 0	1 2	0 7	9 2			0 5 0 0 0
											0 5 0 0 0

OPERATING MODE (8)	6	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check one or more of the following) (11)									
POWER LEVEL (10): 0 0 0	<input type="checkbox"/>	20.405(a)	<input type="checkbox"/>	20.405(c)	<input type="checkbox"/>	60.73(a)(2)(iv)	<input type="checkbox"/>	73.71(b)			
	<input type="checkbox"/>	20.405(a)(1)(i)	<input type="checkbox"/>	60.36(c)(1)	<input type="checkbox"/>	60.73(a)(2)(v)	<input type="checkbox"/>	72.71(c)			
	<input type="checkbox"/>	20.405(a)(1)(ii)	<input type="checkbox"/>	60.36(c)(2)	<input type="checkbox"/>	60.73(a)(2)(vi)	<input checked="" type="checkbox"/>	OTHER (Specify in Abstract below and in Text, NRC Form 365A)			
	<input type="checkbox"/>	20.405(a)(1)(iii)	<input type="checkbox"/>	60.73(a)(2)(j)	<input type="checkbox"/>	60.73(a)(2)(vii)(A)		Voluntary			
	<input type="checkbox"/>	20.405(a)(1)(iv)	<input type="checkbox"/>	60.73(a)(2)(k)	<input type="checkbox"/>	60.73(a)(2)(vii)(B)					
<input type="checkbox"/>	20.405(a)(1)(v)	<input type="checkbox"/>	60.72(a)(2)(iii)	<input type="checkbox"/>	60.73(a)(2)(ix)						

LICENSEE CONTACT FOR THIS LER (12)						TELEPHONE NUMBER					
NAME Steve E. Sampson, Supervisor, Site Licensing						AREA CODE		TELEPHONE NUMBER			
						3 1 4	6 7 6	-	8 6 7 1		

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

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 10/30/92, the Essential Service Water (ESW) Ultimate Heat Sink (UHS) cooling tower train 'B' bypass valve was found approximately 25% open when the remote valve position indications indicated closed. This condition existed since 4/12/92 following valve actuator maintenance which adjusted limit switches during Refuel 5. The 'B' ESW train was initially thought to be inoperable, but subsequently was determined operable in its as found position based on an engineering evaluation supported by an analysis completed by the architect engineer. This report is being made voluntarily. The plant was in Mode 6-Refueling at the time of the event.

The root cause of this event is inadequate communication during shift turnover between personnel responsible for the work which adjusted the limit switches. This resulted in the close limit switch being left without the final adjustment being completed.

Requalification training will be provided to the maintenance electricians and supervisors on written communications to be used on work completion forms, requirements for review of completed work packages and paperwork sign-off in procedures.

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

BASIS FOR A VOLUNTARY REPORT:

On 10/30/92, Essential Service Water (ESW) Ultimate Heat Sink (UHS) cooling tower train 'B' bypass valve EF-HV-0066 was found to be approximately 25% open when the remote valve position indications indicated closed. This condition had existed since 4/12/92 following valve actuator maintenance which had adjusted limit switches during Refuel 5. The 'A' ESW train has been inoperable for maintenance and surveillance at various times since 4/12/92. The 'B' ESW train was initially determined inoperable on 10/30/92 and a phone notification was made to the Nuclear Regulatory Center Operations Center per 10CFR50.72(b)(2)(iii) on 10/30/92 at 1515 CST to report the inoperability of both trains of ESW. Subsequently, the 'B' ESW train was determined to be operable in its as found position based on a utility engineering evaluation supported by an analysis completed by the architect engineer. The 4-hour phone call made 10/30/92 that reported the inoperability of both trains of Essential Service Water (ESW) at various times from 4/12/92 to 10/30/92 was retracted 11/25/92 at 1625 CST.

CONDITION AT TIME OF EVENT:

At Time of Event: Mode 6 - Refueling

At Time of Event Discovery: Mode 1 - Power Operations; 100% Reactor Power

DESCRIPTION OF EVENT:

On 4/09/92, planned maintenance was completed on butterfly valve EF-HV-0066, ESW UHS cooling tower train 'B' bypass valve⁽¹⁾. Following completion of the work, a utility maintenance electrician adjusted the valve actuator limit switches by procedure. Attachment 4, Note 3, to procedure MTM-ZZ-QA006, Limitorque Actuator Limit Switch and Torque Switch Adjustment, instructed the electrician to set the Intermediate 2 rotor such that the valve disc would coast into the seat after the close limit switch contacts opened. The Intermediate 2 limit switch rotor close contacts de-energize the valve actuator when the valve is closing. The electrician set the close limit switch at 20 hand wheel turns (corresponding to approximately 25% open) from the valve fully closed position and recorded that this was the position set on the Work Request (WR) completion form. The second shift electricians read this to mean that the limit switch was adjusted to the appropriate position, and went on to place the remaining limits.

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TEXT: If more space is required, use additional NRC Form 388A-s(17)

On 4/13/92, a valve retest was performed per procedure MTE-ZZ-QA001, Baseline MOVATS Testing of Limitorque Motor Operated Valves. The MOVATS test coordinator ensured the limitorque minimum and maximum thrusts requirements and the maximum stroke time were met. The valve stroked in 19.4 seconds, the maximum allowable stroke time is 35 seconds. The procedure did not require verification of full valve closure or comparison of the stroke time to previous data. Since the readings were satisfactory, the valve passed the MOVATS procedure acceptance criteria.

Valve EF-HV-0066 was surveilled for operability three times after 4/13/92. Procedure OSP-EF-V001B, ESW Train 'B' Valve Operability, was performed on EF-HV-0066 on 4/14/92, 7/29/92 and 10/21/92. This surveillance is satisfied by non-licensed operators locally observing the movement of a position indicator⁽²⁾ attached to the valve stem as the valve is cycled by remote control from the Main Control Board (MCB)⁽³⁾. This was compared against remote valve position indication to meet the surveillance acceptance criteria. The local position indicators on the valve actuator are approximate indicators of the valve disc position and the failure of the indicator associated with EF-HV-0066 to fully rotate through 90 degrees of movement was not noted. There was no positive indication of closed position to compare the indication pointer with. This made it more difficult to determine the full movement of the position indicator.

On 10/30/92, a utility systems engineer performing MOVATS trending evaluations for future maintenance identified inconsistencies in test results that led him to question the settings of the limit switch. Subsequent inspection the same day determined the close limit switch was set to stop valve motion when the valve was approximately 25% from the full closed position. The valve position was corrected immediately by manually closing the valve.

ROOT CAUSE:

The root cause of this event is inadequate communication during shift turnover between the personnel responsible for the work. This resulted in the close limit switch being left without the final adjustment being completed.

CONTRIBUTING FACTORS:

- Procedure MTM-ZZ-QA006 did not give exact guidance concerning the setting of the close limit switch for butterfly valves. The electrician set the close limit switch 20 hand wheel turns from the closed seat with the incorrect understanding that subsequent personnel working on the valve would complete the adjustment. Electricians on the next shift thought that this portion had been completed and did not question the settings, but proceeded to complete the remaining limit switch settings.

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TEXT If more space is required, Use additional NRC Form 386A x(17)

- The second shift electrician recording information in the procedure copied information from the completion form and did not verify that the as-left condition assured the valve closed completely. These steps in the procedure were not signed off and this was not identified during package review by the supervisor.
- Although not directly related to the error which was made in setting the close limit switch, there was general misunderstanding of the capability of the subsequent MOVATS testing to effectively verify butterfly valve seat positioning.
- Procedure MTM-ZZ-QA006 does not require the valve to be energized and stroked to verify limit switch settings.
- Non-licensed operators failed to identify EF-HV-0066 was not going fully closed via local observation during valve retests.

CORRECTIVE ACTIONS:

1. Procedure MTM-ZZ-QA006 will be revised by 3/1/93 to give better guidance on how to set up a limitorque operator on a butterfly valve, including: a starting point for the close limit switch and energizing and stroking the valve to verify settings. In the interim period, supplemental oversight will be provided for similar valve maintenance activities.
2. Requalification training will be provided to the maintenance electricians and supervisors by 9/1/93 on the following:
 - a. MOVATS testing as used on butterfly valves.
 - b. Revised MTM-ZZ-QA006 procedure.
 - c. Training on written communications to be used on work completion forms.
 - d. Procedural requirements for paperwork sign-offs in procedures.
 - e. Requirements for review of completed work packages for supervisors.
3. MOVATS Test Coordinators will be provided with data by 1/1/93 from the previous baseline MOVATS testing to assist in evaluating if any abnormalities are evident.
4. MTE-ZZ-QA001 will be revised by 1/1/93 to provide clarification in evaluating abnormalities such as comparing the switch trace with the previous baseline data for stroke times and bypass switch settings.

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5. Trend reviews of MOVATS testing will be completed by Engineering within 60 days.
6. Non-licensed operators will be trained by 4/1/93 on what to specifically look for when verifying local indications for Section XI tests. If indications are not present or accurate, personnel will be instructed to initiate the appropriate corrective actions.
7. Proper limit switch adjustment was verified and EF-HV-0065, the corresponding valve on 'A' train of ESW, was verified by direct observation on 11/2/92 to be stroking fully closed. Other butterfly valves other than EF-HV-066 and EF-HV-0065 which have a safety-related function to close have been identified. Positive means exist through conduct of post maintenance retests, surveillance tests, or system performance monitoring to verify other valves are fully closed.

SAFETY SIGNIFICANCE:

The 'B' train ESW system was available for heat removal. Although valve EF-HV-0066 was 25% from its full closed position, the 'B' ESW train would have performed its intended function. All of the 'B' ESW flow would have rejected heat to the UHS pond as designed until a high return temperature closed the valve to force the ESW flow to the cooling tower for increased heat rejection. Approximately 50% of the 'B' ESW flow would have been directed to the cooling tower, while the remaining 50% would have continued to reject the heat to the UHS pond. This was verified by field testing with the valve positioned in the as found position. The 'A' train ESW system was available for heat removal with the exception of planned maintenance outages.

Based on an engineering review, valve EF-HV-0066 would have allowed sufficient flow of water to the UHS cooling tower such that adequate heat rejection would have occurred. The engineering review which was performed included adequate conservatism to ensure that equipment relying on this cooling would have performed its safety function during a design basis accident. Therefore, there was no threat to the public health or safety.

PREVIOUS OCCURRENCES:

None.

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FOOTNOTES:

The system and component codes listed below are from the IEEE Standard 805-1985 and 803A-1984.

- (1) System - BI, Component - FLV
- (2) System - BI, Component - ZI
- (3) System - BI, Component - IL