



Callaway Plant

April 08, 2021

ULNRC-06640

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

10 CFR 50.73

Ladies and Gentlemen:

**DOCKET NUMBER 50-483  
CALLAWAY PLANT UNIT 1  
UNION ELECTRIC COMPANY  
RENEWED FACILITY OPERATING LICENSE NPF-30  
LICENSEE EVENT REPORT 2021-001-00  
MANUAL ACTUATION OF ESSENTIAL SERVICE WATER SYSTEM**

The enclosed licensee event report is submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A) to report an event or condition that resulted in a manual actuation of the essential service water system.

This letter does not contain any new commitments.

Sincerely,

Frederick Bianco  
Senior Director, Nuclear Operations

Enclosure:  
LER 2021-001-00

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cc: Mr. Scott A. Morris  
Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region IV  
1600 East Lamar Boulevard  
Arlington, TX 76011-4511

Senior Resident Inspector  
Callaway Resident Office  
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8201 NRC Road  
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Mr. M. Chawla  
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U. S. Nuclear Regulatory Commission  
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**Index and send hardcopy to QA File A160.0761**

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Corporate Oversight

NSRB Secretary

Performance Improvement Coordinator

STARS Regulatory Affairs

Mr. Jay Silberg (Pillsbury Winthrop Shaw Pittman LLP)

Missouri Public Service Commission



**LICENSEE EVENT REPORT (LER)**

(See Page 3 for required number of digits/characters for each block)  
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<b>1. Facility Name</b> Callaway Plant, Unit No. 1	<b>2. Docket Number</b> 05000483	<b>3. Page</b> 1 OF 4
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**4. Title**  
Manual Actuation of Essential Service Water System

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
02	09	2021	2021	- 001 -	00	04	08	2021	Facility Name	05000
									Facility Name	05000

<b>9. Operating Mode</b> MODE 3	<b>10. Power Level</b> 000
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**11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)**

<input checked="" type="checkbox"/> 10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.36(c)(2)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<b>10 CFR Part 73</b>
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(i)	<b>10 CFR Part 21</b>	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(1)(i)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(i)
<input type="checkbox"/> 20.2203(a)(2)(iii)	<b>10 CFR Part 50</b>	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.77(a)(2)(ii)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<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)(v)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	
<input type="checkbox"/> Other (Specify here, in Abstract, or in NRC 366A).				

**12. Licensee Contact for this LER**

Licensee Contact T. B. Elwood, Supervising Engineer, Regulatory Affairs and Licensing	Phone Number (Include Area Code) 314-225-1905
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**13. Complete One Line for each Component Failure Described in this Report**

Cause	System	Component	Manufacturer	Reportable To IRIS	Cause	System	Component	Manufacturer	Reportable To IRIS

<b>14. Supplemental Report Expected</b>	<b>15. Expected Submission Date</b>	Month	Day	Year
<input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)			

**16. Abstract** (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

On February 9, 2021, at 0838 operators commenced placing both trains of Essential Service Water (ESW) in manual alignments in accordance with annunciator response procedure OTA-RK-00014, Addendum 12A, "Service Water Pump Lockout." The manual actuation of ESW was in response to a condition where two non-safety Service Water (SW) pumps tripped and locked out due to low lubrication (lube) water pressure.

The cause of the trips and subsequent lockouts of the 'A' and 'B' SW pumps was attributed to low lube water pressure caused by fouling of the lube water Y-strainers. The fouling occurred since the normal weekly backflush of the Y-strainers could not be performed while a temporary alteration in support of maintenance (TASM) was installed in order to repair a leak in the permanent lube water piping. Preventive Maintenance (PM) tasks had not been initiated prior to the event to periodically clean the Y-strainers in order to compensate for the inability to backflush.

The initial corrective action taken in response to the event was cleaning of the Y-strainers in the lube water piping. In addition, PM tasks were created to clean the Y-strainers on a weekly basis for the remaining time that the TASM was installed. The permanent corrective action was to complete a modification to replace the section of the common lube water piping where the leak occurred.

Both trains of ESW were returned to standby alignments on February 9, 2021 at 1140.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Callaway Plant, Unit No. 1	05000-483	2021	- 001	- 00

**NARRATIVE**

1. DESCRIPTION OF STRUCTURE(S), SYSTEM(S), AND COMPONENT(S):

The event reported in this LER involves the Essential Service Water (ESW) system [EIS: BI] and the nonsafety-related Service Water (SW) system [EIS: KG]. The ESW system provides a safety-related flow of cooling water to transfer residual heat and heat from components to the Ultimate Heat Sink (UHS) [EIS: BS]. The ESW system also provides a non-preferred safety-related source of makeup for the Spent Fuel Storage Pool [EIS: DA] and a non-preferred safety-related supply for the Auxiliary Feedwater [EIS: BA] system.

The ESW system consists of two independent and redundant trains. During normal operation, the loads in either or both ESW system trains may be supplied from the nonsafety-related SW system, which is cross-connected to the ESW system trains. In order to prevent loss of UHS inventory and ensure that pressure and flow in the ESW system trains are sufficient to meet the system's required safety functions, upon receipt of a safety injection signal (SIS) [EIS: JE], loss of offsite power (LOOP) signal, or auxiliary feedwater actuation signal (AFAS) [EIS: JE] with low suction pressure [EIS: PT] indication, both ESW system trains are actuated and safety-related isolation valves [EIS: ISV] isolate nonsafety-related loads and the SW system from ESW system trains.

Technical Specification (TS) 3.7.8, "Essential Service Water System (ESW)," provides the Limiting Condition for Operation (LCO), Required Actions, and Surveillance Requirements (SRs) for the ESW system.

During normal plant operation, the SW system supplies cooling water to various main plant auxiliary heat exchange equipment and returns it to the circulating water system return line inside the plant. The SW system also supplies cooling water to the ESW system components during normal operation.

The three 50 percent system capacity SW pumps are single-stage, double-suction, vertical, constant-speed dual-volute centrifugal type. Lubrication (lube) water is provided to each SW pump to lubricate the pump bearings. There are mesh basket Y-strainers with 1/32-inch perforations installed in the lube water piping to clean the water prior to it entering the pump bearings. Instrumentation is provided for lube water flow and pressure. The normal range for pressure is 15 to 55 pounds per square inch gauge (psig), and the normal range for flow is 3 to 6 gallons per minute (gpm). In order to protect the SW pump bearings in the case of low lube water flow, there are automatic SW pump trip setpoints of 7 psig for lube water pressure and 1.5 gpm for lube water flow.

2. INITIAL PLANT CONDITIONS:

The Callaway plant was in MODE 3 at normal operating temperature and pressure at the time of this event. No major safety related systems were out of service.

3. EVENT DESCRIPTION:

On February 9, 2021, at 0838, operators commenced placing both ESW trains in manual alignments in accordance with annunciator response procedure OTA-RK-00014, Addendum 12A, "Service Water Pump Lockout." The manual actuation of ESW was in response to a condition where two non-safety SW pumps tripped and locked out due to low lube water pressure.

Prior to the event, on January 13, 2021, a pipe leak was identified on the common header supplying lube water to the SW pumps. In order to isolate the leak, a temporary alteration in support of maintenance (TASM) was installed which supplied lube water to the SW pumps from the 'A' circulating water (CW) pump [EIS: KE] lube water supply.

A night order was issued along with the TASM, giving instructions to operators that the SW pump lube water Y-strainers should not be backflushed. The TASM altered the configuration of the SW lube water piping such that backflushing could not be performed. Instead of backflushing, the guidance was to initiate a job to clean the lube water Y-strainers if lube water flow and pressure could not be maintained. (Otherwise, backflushing is normally performed on a weekly basis during outside operator rounds.)



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After the TASM implementation on January 26, 2021, operator rounds identified a degrading trend in lube water pressure for the three SW pumps. The degrading trend was attributed to the lube water Y-strainers becoming fouled due to the inability to perform weekly backflushes. However, jobs to clean the Y-strainers had not been initiated prior to February 9, 2021 since the lube water pressures appeared to have adequate margin to preclude pump lockouts.

On the afternoon of February 8, 2021, the cooling tower bypass valves [EIIIS: KE] were closed during the execution of maintenance activities, aligning the CW return flow from the cooling tower basin to go over the cooling tower fill. Approximately an hour later, the bypass valves were re-opened, realigning the return flow back to the basin. It appears this evolution caused additional sediment to build up in the Y-strainers, resulting in reduced pressure and flow of lube water to the SW pumps.

At 0331 on February 9, 2021, the 'A' SW pump was determined to be locked out on low lube water pressure/flow. The pump was not in service at the time. When the outside operator investigated the pump lockout, the lube water pressure and flow were 10 psig and 2 gpm for 'A' SW pump. The 'B' SW pump lube water pressure/flow was 18 psig/3.5 gpm, and for the 'C' SW pump it was 30 psig/2.75 gpm. A job was initiated to clean the Y-strainers at that time, and the lockout was reset.

At 0838 on February 9, 2021, the 'A' SW pump tripped and locked out on low lube water pressure. The 'B' SW pump auto started but also tripped and locked out on low lube water pressure. The 'C' SW pump continued to run with lube water pressure degraded but greater than the lockout setpoint(s). In response, both trains of ESW were manually started in accordance with the annunciator response procedure for SW pump lockout when less than two SW pumps are running.

Both trains of ESW were returned to standby alignments by 1140 on February 9, 2021, after lube water pressure and flow had sufficiently recovered to allow the 'B' SW pump to be restarted. Jobs were completed to clean the SW Y-strainers for all three SW pumps, on February 9, 2021. Preventive Maintenance (PM) tasks were then generated to clean the Y-strainers on a weekly basis until the pipe repair was completed on the SW lube water common header. The TASM was removed on March 12, 2021 after the repair was completed.

**4. ASSESSMENT OF SAFETY CONSEQUENCES:**

There were no actual nuclear, radiological, or personnel safety impacts associated with this event. The potential impact was on nuclear safety with respect to challenging emergency service water systems that do not normally run and that serve as ultimate heat sinks. ESW is credited to perform safety-related functions required for achieving and maintaining safe shutdown, removing residual heat, and mitigating the consequences of accidents. All safety components functioned as designed, and the ESW system was returned to the standby condition after the SW pumps were restored to service.

**5. REPORTING REQUIREMENTS:**

This LER is submitted pursuant to 50.73(a)(2)(iv)(A) to report a manual actuation of the ESW system. Specifically, 10 CFR 50.73(a)(2)(iv)(A) states in part, "The licensee shall report:

(A) Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section...

(B) The system to which the requirement of paragraph (a)(2)(iv)(A) of this section applies is:

(9) Emergency service water systems that do not normally run and that serve as ultimate heat sinks.

The ESW system was manually actuated on February 9, 2021 at 0838. This fulfills the reporting requirement of 10 CFR 50.73(a)(2)(iv)(A) by actuation of the system specified in 10 CFR 50.73(a)(2)(iv)(B)(9).



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Callaway Plant, Unit No. 1	05000-483	2021	- 001	- 00

6. CAUSE OF THE EVENT:

The cause of the trips and subsequent lockouts of the 'A' and 'B' SW pumps was attributed to low lube water pressure caused by fouling of the lube water Y-strainers. The fouling occurred since the normal weekly backflush of the Y-strainers could not be performed while the TASM was installed in order to repair a leak in the permanent lube water piping. PM tasks had not been initiated prior to the event to periodically clean the Y-strainers in order to compensate for the inability to backflush.

7. CORRECTIVE ACTIONS:

The initial corrective action, which was completed on February 9, 2021, involved cleaning of the Y-strainers in the lube water piping. In addition, PM tasks were created to clean the Y-strainers on a weekly basis for the remaining time that the TASM was installed. The permanent corrective action was to complete a modification to replace the section of the common lube water piping where the leak occurred. The TASM was removed on March 12, 2021 after the permanent modification to replace the lube water piping was installed.

8. PREVIOUS SIMILAR EVENTS:

A review of LERs from the past five years for Callaway found no other events that resulted in the manual actuation of ESW.