



Callaway Plant

March 12, 2018

ULNRC-06421

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

10 CFR 50.73(a)(2)(i)(B)

Ladies and Gentlemen:

**DOCKET NUMBER 50-483  
CALLAWAY PLANT UNIT 1  
UNION ELECTRIC CO.  
RENEWED FACILITY OPERATING LICENSE NPF-30  
LICENSEE EVENT REPORT 2018-001-00  
VIOLATION OF TECHNICAL SPECIFICATION 3.6.3  
CONTAINMENT ISOLATION MANUAL VALVE FOUND IN OPEN POSITION**

The enclosed Licensee Event Report (LER) is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) to report a violation of Technical Specification 3.6.3, "Containment Isolation Valves," due to the inoperability of the outside containment isolation valve for containment penetration P-63.

This letter does not contain new commitments.

If you have any questions concerning this LER, please contact Tom Elwood, Supervising Engineer, Regulatory Affairs and Licensing at (314) 225-1905.

Sincerely,

A handwritten signature in blue ink, appearing to read "Barry L. Cox", written over a horizontal line.

Barry L. Cox  
Senior Director, Nuclear Operations

Enclosure: LER 2018-001-00

cc: Mr. Kriss M. Kennedy  
Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region IV  
1600 East Lamar Boulevard  
Arlington, TX 76011-4511

Senior Resident Inspector  
Callaway Resident Office  
U.S. Nuclear Regulatory Commission  
8201 NRC Road  
Steedman, MO 65077

Mr. L. John Klos  
Project Manager, Callaway Plant  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Mail Stop O8H4  
Washington, DC 20555-0001

**Index and send hardcopy to QA File A160.0761**

**Hardcopy:**

Certrec Corporation  
6100 Western Place, Suite 1050  
Fort Worth, TX 76107  
(Certrec receives ALL attachments as long as they are non-safeguards and may be publicly disclosed.)

**Electronic distribution for the following can be made via LER ULNRC Distribution:**

F. M. Diya  
B. L. Cox  
T. E. Herrmann  
S. P. Banker  
R. C. Wink  
T. B. Elwood  
F. J. Bianco  
M. K. Covey  
B. D. Price  
Corporate Oversight  
Corporate Communications  
NSRB Secretary  
Performance Improvement Coordinator  
Resident Inspectors (NRC)  
STARS Regulatory Affairs  
Mr. Jay Silberg (Pillsbury Winthrop Shaw Pittman LLP)  
Missouri Public Service Commission



## LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@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 12. DOCKET NUMBER  
050004833. PAGE  
1 of 5

## 4. TITLE

Violation of Technical Specification 3.6.3, "Containment Isolation Manual Valve Found in Open Position"

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
01	11	2018	2018	001	000	03	12	2018	FACILITY NAME	DOCKET NUMBER
										05000
									FACILITY NAME	DOCKET NUMBER
										05000

## 9. OPERATING MODE

Mode 1

## 11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(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)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
<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)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
<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)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> OTHER	Specify in Abstract below or in NRC Form 366A

## 12. LICENSEE CONTACT FOR THIS LER

## LICENSEE CONTACT

T.B. Elwood, Supervising Engineer, Regulatory Affairs and Licensing

## TELEPHONE NUMBER (Include Area Code)

314-225-1905

## 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
D	BD	ISV	Velan	N					

## 14. SUPPLEMENTAL REPORT EXPECTED

☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE)☒ NO

## 15. EXPECTED SUBMISSION DATE

MONTH DAY YEAR

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

Between 11/25/2017 and 01/11/2018, containment isolation valve KAV0118 was inoperable due to being open. This normally closed manual valve serves as the outside containment isolation valve for a service air line that passes into containment through penetration P-63. The containment isolation/integrity function for P-63 was maintained by KAV0039, the inner containment isolation valve, during the time KAV0118 was inoperable.

An Operations Technician found the valve in the fully open position on 01/11/2018. The valve had been left in the open position after the penetration had been used to provide service air in containment during Refuel 22. Technical Specification (TS) 3.6.3 requires each containment isolation valve to be OPERABLE in Modes 1 through 4. In this case, it was not recognized that the valve was in full open position when the plant entered Mode 4 on 11/25/2017. Therefore, a condition prohibited by TS 3.6.3 occurred due to failure to comply with the Required Actions specified in the TS. The TS 3.6.3 Actions were exited at 0959 on 1/11/2018 after valve KAV0118 was closed and locked in the closed position.

The root cause of the valve inoperability was inadequate procedural control to ensure KAV0118 was locked closed prior to entering Mode 4. For corrective action, procedures will be revised to ensure that the valve is closed prior to Mode 4.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@nrc.gov), and to the Desk Officer, Office of Information and Regulatory Affairs, NEOF-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	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Callaway Plant Unit 1	05000-483	2018	001	000

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

The issue addressed in this LER concerns a normally closed manual valve that serves as a containment isolation valve (CIV) [EIIIS System: BD, Component: ISV] for the penetration flow path(s) associated with containment penetration P-63. The line penetrating containment at penetration P-63 is a service air line [EIIIS System: LF] to the service air connections inside containment. The containment isolation provisions for this line consist of CIVs inside and outside containment, consistent with the requirements of General Design Criterion (GDC) 56.

In general, the containment isolation valves form part of the containment pressure boundary and provide a means for fluid penetration flow paths not serving accident consequence limiting systems to be provided with two isolation barriers that are closed on a containment isolation signal. These isolation devices are either passive or active (automatic). Manual valves, de-activated automatic valves secured in their closed position (including check valves with flow through the valve secured), blind flanges, and closed systems are considered passive devices. Check valves or other automatic valves that are designed to close without operator action following an accident are considered active devices.

Two barriers in series are provided for each penetration flow path so that no single credible failure or malfunction of an active component can result in a loss of isolation or leakage that exceeds limits assumed in the safety analyses. The containment isolation valves are subject to the requirements of Technical Specification (TS) 3.6.3, "Containment Isolation Valves." The Limiting Condition for Operation (LCO) of TS 3.6.3 was derived from the assumptions related to minimizing the loss of reactor coolant inventory and establishing the containment boundary during a design basis accident (DBA).

TS operability requirements for the CIVs support assumptions in the safety analysis of any event requiring isolation of containment. The DBAs that result in a release of radioactive material within containment are a loss of coolant accident (LOCA) and a rod ejection accident. In the analyses for each of these accidents, it is assumed that containment isolation valves are either closed or function to close within the required isolation time following event initiation. This ensures that potential paths to the environment through containment isolation valves (including containment shutdown purge and mini-purge valves) are minimized.

For the DBAs involving release of fission product radioactivity, release to the environment is controlled by the containment leak rate. TS 3.6.1, "Containment," requires containment leakage to be limited to less or equal to the specified leak rate limit. For CIVs, TS 3.6.1 requires leakage rate testing in accordance with the Containment Leakage Rate Testing Program. When both valves in a containment penetration flowpath are operable, overall containment leakage is calculated based upon the maximum leakage of the two valves for entry into Mode 4 from Mode 5. In Modes 1-3, leakage is allowed to be calculated based upon minimum leakage of the two valves.

**KAV0118 AND ASSOCIATED PIPING GENERAL OVERVIEW**

The Reactor Building Service Air supply is provided by a single 4-inch line that passes through containment penetration P-63. The service air system inside the Reactor Building consists of service air connections, each with isolation valves, drain and vent valves, test connections, strainers and two drain traps.

The configuration of Penetration P-63 consists of a manual isolation valve outside containment, KAV0118, and a check valve inside containment, KAV0039, which complies with 10 CFR 50 Appendix A GDC-56, "Primary Containment



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@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	2. DOCKET NUMBER	3. LER NUMBER		
Callaway Plant Unit 1	05000-483	YEAR  2018	SEQUENTIAL NUMBER  001	REV NO  000

Isolation," for lines that penetrate containment and connect directly to the containment atmosphere. The P-63 piping is ASME III Class 2, 150 PSI, carbon steel schedule 40 piping. The valves are ASME III Class 2, 150 PSI. Both the piping and valves are seismic Category 1.

Valve KAV0118 is normally in a locked-closed position during modes 1 through 4. KAV0118 is opened for plant shutdown in accordance with OTG-ZZ-00006, "Plant Cooldown Hot Standby to Cold Shutdown."

**2. INITIAL PLANT CONDITIONS:**

Callaway Plant was at 100% power at the time it was determined that KAV0118 was not closed.

**3. EVENT DESCRIPTION:**

The purpose of surveillance procedure OSP-GP-00001, "Containment Isolation Verification," is to provide verification of containment isolation by a periodic surveillance of containment penetration manual valves, blind flanges, and other devices. Attachment 4 of OSP-GP-00001, "Containment Isolation Verification Outside Containment Mode 5 to Entering Mode 4," is used to check the status of approximately 100 components outside containment for containment penetration closure. The procedure is done to ensure compliance with TS Surveillance Requirement (SR) 3.6.3.3 prior to entering Mode 4.

One of the valves on the attachment, KAV0118, remained open when the attachment was initially completed. KAV0118 remained open since service air was still required for completing containment cleaning activities in preparation for final containment close-out. The tracking of the requirement to close KAV0118 prior to mode 4 was later transferred to the Equipment Out of Service Log (EOSL), entry 21757, and the job documenting completion of OSP-GP-00001 was taken to the complete status on 11/20/2017. The job to clean containment was closed on 11/24/2017 at 1154, but KAV0118 remained open.

Later on 11/24/2017, an Operating Supervisor reviewed EOSL 21757 to see if it could be completed. He reviewed the computer based work management application completion report for OSP-GP-00001 and did not see any exceptions. He completed the note on the EOSL about "waiting for completion of vacuum use in CTMT (job 16507456.500) prior to completing this EOSL" and saw that the job was also complete. Based on both of these jobs being completed, he incorrectly concluded that KAV0118 had been closed and that the EOSL could be completed. He completed EOSL 21757, at which point there was no further tracking or instructions available to close KAV0118 or to check that it was closed prior to entering Mode 4.

The plant entered Mode 4 on 11/25/2017 at 0720 with KAV0118 still open. As noted in the Bases for TS 3.6.3, normally closed manual CIVs are considered OPERABLE only when closed. Thus, KAV0118 was inoperable when the plant entered Mode 4 on 11/25/2017. Since it was not known that KAV0118 was inoperable, the Required Actions of TS 3.6.3 were not performed within the required Completion Time, resulting in non-compliance with TS 3.6.3 (as well as Limiting Condition for Operation (LCO) 3.0.4 as discussed further in section 5 of this LER).

On 1/11/2018 at 0900, during regular Primary Operator rounds, KAV0118 was discovered unlocked and open. Condition A of TS 3.6.3 was entered for the inoperable CIV. The Primary Operator was instructed to close and lock KAV0118 which allowed Condition A of TS 3.6.3 to be exited. These actions restored compliance with TS 3.6.3 at 0959 on 1/11/2018.



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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@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	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Callaway Plant Unit 1	05000-483	2018	001	000

**4. ASSESSMENT OF SAFETY CONSEQUENCES:**

With KAV0118 in a fully open position during the noted time period, the containment penetration isolation function was adversely impacted but still fulfilled. The event is not considered to be a degraded or unanalyzed condition that significantly affected plant safety per 10 CFR 50.73(a)(2)(ii) since the containment isolation/integrity function was maintained by KAV0039, the inner containment isolation valve for penetration P-63. Further, an as-found local leak rate test (LLRT) was performed on KAV0039 shortly after the condition was found. The result was a measured leakage of 1277 standard cubic centimeters per minute, which was below the target value of 3,200 standard cubic centimeters per minute. Therefore, the total containment "as-found" minimum pathway leak rate remained within the limits of TS 3.6.1 during the timeframe when KAV0118 was inoperable, and for this reason, the event/condition was of low safety significance.

In addition, per TS 3.6.3 Condition A, the plant could have continued operation with KAV0118 inoperable as long as flow through check valve KAV0039 was secured, as defined in the TS bases. In order to determine if flow was secured, a leak tightness test of the service air header in containment was performed. This job demonstrated that flow was secured through inner containment isolation check valve KAV0039. However, the components that secured that flow included drain traps and manual valves that would not meet the criteria of the examples given in TS Bases 3.6.3 on how flow should be secured, so no credit was taken for the test. The test did demonstrate that the flow was secured for the check valve, thus adding to the determination that the event/condition was of low safety significance.

**5. REPORTING REQUIREMENTS:**

This LER is submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) to report a condition prohibited by Technical Specifications.

Specifically, with KAV0118 inoperable during applicable plant Modes, Condition A of TS 3.6.3 would have been required to be entered. This Condition applies to penetration flow paths having two containment isolation valves (which is the case for P-63 and its associated penetration flow paths, particularly the KAV0118-KAV0039 penetration flow path). Per Condition A, for one or more penetration flow paths with one containment isolation valve inoperable, Required Actions A.1 and A.2 must be entered. Required Action A.1 requires isolating the affected penetration flow path by use of at least one de-activated automatic valve, closed manual valve, blind flange, or check valve with flow secured through the valve, within a specified Completion Time of 4 hours. Required Action A.2 requires verifying that the affected penetration flow path is isolated, prior to entering MODE 4 from MODE 5 if not performed with the previous 90 days for isolation devices inside containment. With either (or both) of these Completion Times and Required Actions not met, Condition E applies and its Required Actions E.1 and E.3 become applicable. These Required Actions require the plant to be shut down such that per Required Action E.1, the plant must be in Mode 3 within 6 hours, and per Required Action E.2, the plant must be in Mode 5 within 36 hours.

Since KAV0118 was not known to be inoperable when the plant entered the Applicability of LCO 3.6.3 upon restart from Refuel 22, the above-noted Conditions and Required Actions were not entered and thus not met. Compliance with Required Action A.1, in particular, would have been the isolation of the affected penetration flow path by use of check valve KAV0039, with flow through the valve secured, within 4 hours. With Required Action A.1 not met within 4 hours, the plant should have been in or brought back to Mode 3 within the following 6 hours per Required Action E.1, and to Mode 5 within 36 hours.

It may also be noted that a violation of LCO 3.0.4.a occurred in connection with the plant entering the Applicability of LCO 3.6.3, with the valve inoperable. With an LCO not met, LCO 3.0.4.a only permits entry into the Applicability of that LCO when the associated Actions to be entered permit continued operation in the applicable Mode for an unlimited period of time. This provision would only have been met if Required Actions A.1 and A.2 of LCO 3.6.3 had been met.

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

(See NUREG-1022, R.3 for instruction and guidance for completing this form  
<http://www.nrc.gov/reading-m/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [Infocollects.Resource@nrc.gov](mailto:Infocollects.Resource@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	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO
Callaway Plant Unit 1	05000-483	2018	001	000

**6. CAUSE OF THE EVENT:**

This event was evaluated using a root cause analysis process. The causal factor (CF) identified with the root cause was inadequate procedures associated with closing KAV0118. The root cause for this event was that the procedure guidance did not direct closing and locking KAV0118. The contributing causes (CC) associated with this CF include the need for better guidance on administrative controls as defined in the TS 3.6.3 Bases.

**7. CORRECTIVE ACTIONS:**

The corrective action to prevent recurrence for this event is to revise procedures to ensure KAV0118 is closed prior to entering Mode 4 and to provide additional guidance on actions required if KAV0118 is to remain open (under the administrative controls allowed per TS 3.6.3 with the applicable Condition/Required Action(s) in effect for the inoperable CIV) at the time of the mode change. This will ensure TS 3.6.3 is met for any future mode changes when entering Mode 4 from Mode 5.

**8. PREVIOUS SIMILAR EVENTS:**

LER 2017-003-00 documents a violation of TS 3.6.3 where the failure of normally closed containment isolation check valve KCV0478 to fully close was identified. While that LER is associated with the same TS, the cause of that reported condition is unrelated to the condition reported in this LER, and the corrective actions taken would not have prevented the KAV0118 event.

LER 2010-007-00 documents a violation of TS 3.6.3 where the failure to adequately implement administrative controls for opening a normally closed containment isolation valve was identified. While that LER is associated with the same TS, the cause of that reported condition is unrelated to the condition reported in this LER, and the corrective actions taken would not have prevented the KAV0118 event.