



Omaha Public Power District

444 South 16<sup>th</sup> Street Mall  
Omaha, NE 68102-2247

10 CFR 50.73

LIC-15-0062  
June 15, 2015

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

Fort Calhoun Station, Unit No. 1  
Renewed Facility Operating License No. DPR-40  
NRC Docket No. 50-285

**Subject: Licensee Event Report 2015-003, Revision 0, for the Fort Calhoun Station**

Please find attached Licensee Event Report 2015-003, Revision 0. This report is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) and 50.73(a)(2)(v)(B). There are no new commitments being made in this letter.

If you should have any questions, please contact Terrence W. Simpkin, Manager, Site Regulatory Assurance, at (402) 533-6263.

Sincerely,

Louis P. Cortopassi  
Site Vice President and CNO

LPC/epm

Attachment

c: M. L. Dapas, NRC Regional Administrator, Region IV  
C. F. Lyon, NRC Senior Project Manager  
S.M. Schneider, NRC Senior Resident Inspector

**LICENSEE EVENT REPORT (LER)**

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

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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to 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.

<b>1. FACILITY NAME</b>  Fort Calhoun Station	<b>2. DOCKET NUMBER</b>  05000285	<b>3. PAGE</b>  1 OF 4
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Containment Spray Inoperable due to Original Design Error

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
04	16	2015	2015	003 - 00		06	15	2015	FACILITY NAME	DOCKET NUMBER
										05000
										05000

9. OPERATING MODE		11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)			
5	<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)	
10. POWER LEVEL  0	<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 checked="" 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**

LICENSEE CONTACT  Erick Matzke	TELEPHONE NUMBER (Include Area Code)  402-533-6855
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**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

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

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

During design basis reconstitution of the Containment Spray (CS) system, it was discovered that the CS piping inside containment and the containment liner have higher stresses during a postulated Main Steam Line Break (MSLB) or Loss of Coolant Accident (LOCA) than previously analyzed. The preliminary analysis concluded that both CS piping trains inside containment and the containment liner failed to meet the operability requirements of American Society of Mechanical Engineers (ASME) Section III Appendix F without implementing compensatory measures.

A cause analysis was performed and determined that thermal expansion was never considered for the containment riser supports. This is a flaw in the original design of the CS header and rings inside containment.

An operability evaluation was completed in support of plant operation. The operability evaluation conclude that the piping and pipe supports of the CS System as well as the Containment liner are capable of performing their intended safety functions per the operability criteria of ASME BPVC Section III Appendix F following modifications completed under Engineering Change (EC) 65926. Additional evaluation determined that only one pipe support exceeded the code allowable stresses. Final corrective action to fully qualify the CS system will be completed under the stations corrective action program.



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

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 FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet 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	6. LER NUMBER			3. PAGE	
Fort Calhoun Station	05000285	YEAR	SEQUENTIAL NUMBER	REV NO.	2	OF 4
		2015	- 003	- 00		

**NARRATIVE**

**BACKGROUND**

Fort Calhoun Station (FCS) is a two-loop reactor coolant system of Combustion Engineering design.

**EVENT DESCRIPTION**

During design basis reconstitution of the Containment Spray (CS) system, it was discovered that the CS piping inside containment and the containment liner have higher stresses during a postulated Main Steam Line Break (MSLB) or Loss of Coolant Accident (LOCA) than previously analyzed. The preliminary analysis concluded that both CS piping trains inside containment and the containment liner failed to meet the operability requirements of American Society of Mechanical Engineers (ASME) Section III Appendix F without implementing compensatory measures.

Evaluation of the condition identified three underlying issues:

1. Original plant design did not postulate that the empty CS pipe inside containment could heatup to approximately 290 degrees Fahrenheit following a postulated MSLB or LOCA. Documented in condition report (CR) 2015-04578.
2. Thermally stressed CS piping would transpose high loads onto the Containment liner because the CS pipe supports are directly attached to the liner. Documented in CR 2015-04578.
3. Poor configuration control during original construction resulted in 1 missing U-bolt in spray ring piping (due to spray nozzle interference), 2 supports had missing kickers and support gaps which were not properly indicated on plant drawings. Documented in CR 2015-06013.

The plant was in a cold shutdown condition for a refueling outage when the issue was discovered on April 16, 2015.

The extent of condition (EOC) was evaluated and is limited to the CS ring header piping downstream of Containment penetrations M-86 and M-89 in containment. The extent of condition does not extend to other safety injection (SI) piping because the CS system is open ended and voided when in standby and would therefore experience a temperature increase immediately prior to being filled with relatively cool water during accident conditions. The CS ring header piping is unique when compared to other SI piping, thereby limiting the extent of condition. Other containment cooling systems such as CCW are closed loop systems that are filled with water.

An EOC was also completed to ensure that there were no additional discrepancies with this CS piping and supports inside containment.



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Fort Calhoun Station	05000285	YEAR	SEQUENTIAL NUMBER	REV NO.	3	OF 4
		2015	- 003	- 00		

**NARRATIVE**

An evaluation has been conducted by the station. The results of the evaluation conclude that containment spray and containment systems prior to the discovery of the issue were capable of performing their intended safety functions during a postulated MSLB or LOCA without modification. In addition, only one pipe support exceeds the code allowable stresses of ASME BPVC Section III Appendix F.

This report is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B) and 50.73(a)(2)(v)(B).

**CONCLUSION**

The large bore CS piping inside containment had never undergone an extensive design review due to the location of the piping (Containment dome). This review required tools previously not available (3D Laser Scan).

A cause analysis was performed and determined that thermal expansion was never considered for the containment riser supports. This is a flaw in the original design of the CS header and rings inside containment.

The material discrepancies identified as part of the EOC walkdown/3D Laser Scan were determined to be caused by poor configuration control during original construction.

**CORRECTIVE ACTIONS**

An EOC, previously mentioned, was completed using 3D Laser Scanning and walkdown of the containment. This evaluation determined that one of the CS piping supports SIS-110 was missing one U-Bolt, SIH-283 and SIS-284 were missing kickers and SIS-230 had gaps larger than specified.

An operability evaluation was completed in support of plant operation. The operability evaluation, utilizing calculation FC08434, conclude that the piping and pipe supports of the CS System as well as the Containment liner are capable of performing their intended safety functions per the operability criteria of ASME BPVC Section III Appendix F following modifications completed under Engineering Changes (EC) 65926.

Final corrective actions to fully qualify the CS system will be completed under the stations corrective action program.



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1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
Fort Calhoun Station	05000285	YEAR	SEQUENTIAL NUMBER	REV NO.	4 OF 4
		2015	- 003	- 00	

**NARRATIVE**

**SAFETY SIGNIFICANCE**

An evaluation has been conducted by the station. The results of the evaluation conclude that containment spray and containment systems prior to the discovery of the issue were capable of performing their intended safety functions during a postulated MSLB or LOCA without modification. In addition, only one pipe support exceeds the code allowable stresses of ASME BPVC Section III Appendix F. Although code allowable stresses were exceeded, the affected train would have delivered design flow during design basis events.

**SAFETY SYSTEM FUNCTIONAL FAILURE**

This does represent a safety system functional failure in accordance with NEI 99-02, revision 7.

**PREVIOUS EVENTS**

LER 2013-017