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
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.
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 heat up 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.
### 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.
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