Ameren MISSOURI

Callaway Plant

October 17, 2013

ULNRC-06048

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

10 CFR 50.55a

Ladies and Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC CO.
FACILITY OPERATING LICENSE NPF-30
10 CFR 50.55a REQUEST: PROPOSED ALTERNATIVE TO ASME SECTION XI REQUIREMENTS REGARDING SYSTEM LEAKAGE TESTS OF CLASS 1 PIPING AND COMPONENTS ISOLATED BETWEEN NORMALLY CLOSED VALVES

Pursuant to 10 CFR 50.55a(a)(3)(ii), Union Electric Company (Ameren Missouri) hereby requests NRC approval of attached Relief Request I3R-15 regarding the scope of Class 1 pressure retaining piping and components required to be included in system leakage testing at a pressure corresponding to 100% power operation, as specified per Paragraph IWB-5222(b) of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI. Relief is requested on the basis that compliance with the Code-specified testing requirements is impractical and would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. A proposed alternative approach to the required testing is described in the attached relief request.

Justification for the requested relief is included in the Relief Request document itself which is provided as Attachment 1. Also provided as Attachment 2 are five (5) Piping and Instrumentation drawings (P&IDs) marked to indicate the piping and components for which relief from the Code leakage testing requirements are requested.

The Code Edition applicable to this request and to the current (third) 10-year Inservice Inspection (ISI) interval for Callaway Plant is the 1998 Edition (up to and including the 2000 Addenda). As noted in the attached relief request, the relief is requested for the remainder of the current 10-year ISI interval which ends on December 18, 2014. Therefore approval of the relief is respectfully requested by October 17, 2014 (one year from submittal of this request) in order to allow sufficient time for completion of the affect testing activities (using the proposed alternative methods) within the current interval.

This letter does not contain new commitments. If there are any questions, please contact me at 573-676-8719 or Tom Elwood at 314-225-1905.

Sincerely,

S. A. Maglio
Regulatory Affairs Manager

TBE/nls

Attachments
1) 10 CFR 50.55(a) Request I3R-15
2) Piping and Instrumentation Drawings (P&IDs)

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Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(ii)

—Hardship or Unusual Difficulty
without Compensating Increase in Level of Quality or Safety—

1. ASME Code Components Affected

ASME Code Class: Code Class 1

References: ASME Section XI, Table IWB-2500-1 and IWB-5222(b)

Examination Category: B-P

Item Number: B15.10 and B15.70

Description: Class 1 piping and components isolated between normally closed valves when the unit is in normal operation.

System: Reactor Coolant System (BB)
Chemical and Volume Control System (BG)
High Pressure Coolant Injection (EM)
Residual Heat Removal (EJ)

Components:

Group 1, BB Drains

Isolation Valves
BBV0008
BBV0028
BBV0047
BBV0066
BBV0009
BBV0029
BBV0048
BBV0067

Piping	Pipe Size / Schedule	Material	Design Pressure (PSIG)	Approximate Line Lengths (feet)
BB-020-BCA-2"	2"/160	SA-376, TP-304	2485	2
BB-037-BCA-2"	2"/160	SA-376, TP-304	485	1
BB-055-BCA-2"	2"/160	SA-376, TP-304	2485	1
BB-074-BCA-2"	2"/160	SA-376, TP-304	2485	1

Group 1 piping and components are shown on M-22BB01.

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Group 2, EM Cold Leg Injection

Isolation Valves	Flow Elements	Valves
EM8815	EMFE0924	EMV0107
BBV0001	EMFE0925	EMV0108
BBV0022	EMFE0926	EMV0109
BBV0040	EMFE0927	EMV0110
BBV0059		

Piping	Pipe Size / Schedule	Material	Design Pressure (PSIG)	Approximate Line Lengths (feet)
EM-082-BCA-3"	3"/160	SA-312, TP-304	2485	42
EM-083-BCA-1 ½"	1.5"/160	SA-376, TP-304	2485	42
EM-084-BCA-1 ½"	1.5"/160	SA-376, TP-304	2485	39
EM-086-BCA-1 ½"	1.5"/160	SA-376, TP-304	2485	67
EM-087-BCA-1 ½"	1.5"/160	SA-376, TP-304	2485	67

Group 2 piping and components are shown on M-22EM02 and M-22BB01.

Group 3, EJ Suction

Isolation Valves
BBPV8702A
BBPV8702B
EJHV8701A
EJHV8701B

Piping	Pipe Size / Schedule	Material	Design Pressure (PSIG)	Approximate Line Lengths (feet)
EJ-001-BCA-12"	12"/140	SA-312, TP-304	2485	47
EJ-008-BCA-12"	12"/140	SA-312, TP-304	2485	42

Group 3 piping and components are shown on M-22BB01 and M-22EJ01.

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Group 4, BG Auxiliary Spray and Normal Charging

Isolation Valves
BGHV8145
BB8378A
BBV0084
BB8378B

Piping	Pipe Size / Schedule	Material	Design Pressure (PSIG)	Approximate Line Lengths (feet)
BG-027-BCA-2"	2"/160	SA-376, TP-304	2485	1
BB-004-BCA-3"	3"/160	SA-376, TP-304	2485	3

Group 4 piping and components are shown on M-22BB01, M-22BB02, and M-22BG01.

Group 5, EJ and EM Hot Leg Injection

Isolation Valves
EMV0001
EMV0002
EMV0003
EMV0004
BB8949B
BB8949C
BB8949E
BB8949D
EJ8841A
EJ8841B

Piping	Pipe Size / Schedule	Material	Design Pressure (PSIG)	Approximate Line Lengths (feet)
EM-009-BCA-2"	2"/160	SA-376, TP-304	2485	18
EM-012-BCA-2"	2"/160	SA-376, TP-304	2485	26
EM-017-BCA-2"	2"/160	SA-376, TP-304	2485	25
EM-020-BCA-2"	2"/160	SA-376, TP-304	2485	23
EM-021-BCA-6"	6"/160	SA-312, TP-304	2485	1
EM-010-BCA-6"	6"/160	SA-312, TP-304	2485	40
EM-013-BCA-6"	6"/160	SA-312, TP-304	2485	38

Group 5 piping and components are shown on M-22BB01, M-22EM01, and M-22EJ01.

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2. Applicable Code Edition and Addenda

ASME Section XI, 1998 Edition with 2000 Addenda

3. Applicable Code Requirement

ASME Section XI, IWB-2500, Table IWB-2500-1, Examination Category B-P, requires a system leakage test in accordance with IWB-5220 and visual, VT-2 examination of Items B15.50 and B15.70 during each refueling outage.

IWB-5221(a) requires that the system leakage test be conducted at a pressure not less than the pressure corresponding to 100% rated reactor power.

IWB-5222(b) requires that the pressure retaining boundary during the system leakage test conducted at or near the end of each inspection interval be extended to all Class 1 pressure retaining components within the system boundary.

4. Reason for Request

Complying with IWB-5222(b) for the Class 1 components identified in this request causes a hardship or unusual difficulty without a compensating increase in the level of quality and safety. These components will see reactor coolant system (RCS) pressure only if leakage occurs past the inboard isolation valve.

Group 1, BB Drains

The drains off the BB system contain double, manual isolation valves that remain closed during normal operation. Opening the inboard isolation valves when the RCS is at operating pressure of 2235 pounds per square inch gauge (psig) in order to pressurize the segments would violate the 10 CFR 50.55a(c)(2)(ii) required double isolation valve barrier of the RCS boundary during plant operation. This would also leave only one isolation valve protecting the non-Code, downstream piping which is not designed for RCS pressure. Leakage past the valve could cause the downstream piping to fail and thereby cause a safety hazard to nearby personnel. Only one of the four sections has a fitting that might be used for external pressurization, but this again would pose a safety hazard should the outboard isolation valve leak by.

Group 2, EM Cold Leg Injection

This section is not normally pressurized to RCS operating pressure (2235 psig). Pressure Isolation Valve check valve tests are performed with use of a hydro pump, but the pressure is kept well below RCS pressure so as not to have a positive reactivity addition from the water contained in the hydro pump. This system is not heated, so use of the system pumps while the RCS is at operating temperature and pressure to pressurize the line would cause a cold leg thermal transient causing damage to the piping and welds due to thermal fatigue.

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Group 3, EJ Suction

This group will see RCS operating pressure (2235 psig) only if the inboard isolation valves were to leak by. The isolation valves are equipped with interlocks to prevent their opening when RCS pressure is above 360 psig. To test in Mode 3 when the RCS is at full operating pressure (2235 psig), the valve interlocks would have to be bypassed in order to open the inboard isolation valves. With the inboard isolation valve open, in violation of 10 CFR 50.55a(c)(2)(ii), the remainder of the RHR system is protected from over pressurization by only one valve. The EJ system is not designed to RCS pressure, and leakage past the isolation valve could cause damage to the EJ piping which would, in turn, endanger the safety of nearby personnel. Testing at RCS pressure while in lower Modes with use of a hydro pump still poses the danger of damage to the EJ system piping should the isolation valves leak by.

Group 4, BG Auxiliary Spray and Normal Charging

Normal Charging – The plant is now operating with the Auxiliary Charging lines providing RCS makeup so as to reduce the additional fatigue cycles on the Normal Charging lines. The Normal Charging lines were used for most of plant life and accumulated many fatigue cycles, so now the Alternate Charging lines are being used to equalize the cumulative fatigue usage between the two lines in accordance with the original design basis. This segment is typically flushed at a pressure of around 300 psig at the beginning of each refuel to reduce dose rates, but due to the opportunistic nature of the flush, the desired plant conditions, including RCS pressure, length of time of the flush, and flush pressure cannot be guaranteed.

Auxiliary Spray – Using the system pumps to pressurize and flow water through this line while the RCS is in Mode 3 at operating pressure would constitute an auxiliary spray actuation cycle. This design transient is undesirable because it would force cold water from the static piping into the Pressurizer spray line resulting in a thermal design cycle. The plant design only allows 10 of these cycles over the plant design life per FSAR Table 3.9(N)-1A. Pressurization of this line with an external source, such as a hydro pump, is not possible without modification because this segment is not equipped with a test connection.

Group 5, EJ and EM Hot Leg Injection

This group will see RCS operating pressure (2235 psig) only if the inboard isolation valves were to leak by. The system pumps, Safety Injection and Residual Heat Removal, cannot provide sufficient pressure to meet IWB-5222(b) requirements. The Safety Injection pumps are used to pressurize this group when performing Pressure Isolation Valve leakage tests, and these tests are performed when the RCS is at sufficient pressure such that the Safety Injection pumps will not unseat the inboard isolation check valves. Were a hydrostatic pump to be used to pressurize the piping, the test pressure would still be set below RCS pressure so as not to unseat the inboard isolation check valves. Bypassing or otherwise defeating the inboard check valves while in Mode 3 in order to pressurize this group would violate the provisions of 10 CFR 50.55a(c)(2)(ii) which require double isolation.

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5. Proposed Alternative and Basis for Use

Group 1, BB Drains

The boundary of IWB-5222(a) shall apply, and the VT-2 examination will be performed while the RCS is at the pressure associated with 100% reactor power and will extend to and include the second closed valve at the boundary extremity. In addition, the non-isolable Class 1 portion of lines BB-020-BCA-2", BB-037-BCA-2", and BB-074-BCA-2" are volumetrically examined as part of an augmented ISI program in accordance with MRP-146 (Materials Reliability Program: Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines).

Group 2, EM Cold Leg Injection

The pressure test will be performed during Pressure Isolation Valve check valve testing at a pressure of not less than 250 psig.

Group 3, EJ Suction

The pressure test will be performed during plant startup when the EJ system is in use and at a pressure of not less than 300 psig. In addition, one pipe-to-elbow weld (2-EJ-04-F034) between valves BBPV8702A and BBHV8701A on line EJ-001-BCA-12" and one pipe-to-elbow weld (2-EJ-04-S014-D) between valves BBPV8702B and BBHV8701B on line EJ-008-BCA-12" are examined as part of Callaway's Inservice Inspection (ISI) Program.

Group 4

Normal Charging

The pressure test will be performed with the line isolated when the RCS is at the pressure corresponding to 100% reactor power, and the VT-2 will extend to the second closed valve at the boundary extremity. In addition, the pipe-to-valve weld (2-BG-21-F012) on line BB-004-BCA-3" to valve BB8378A is volumetrically examined as part of Callaway's ISI program.

Auxiliary Spray

The pressure test will be performed when Auxiliary Spray is in use during plant heatup when RCS pressure is not less than 300 psig. In addition, the pipe-to-valve weld (2-BG-24-FW061) on line BG-027-BCA-2" to valve BBV0084 is volumetrically examined as part of Callaway's ISI program.

Group 5, EJ and EM Hot Leg Injection

The pressure test will be performed during Pressure Isolation Valve check valve testing at a pressure of not less than 1485 psig.

All Groups

The VT-2 examination required at the end of every refueling outage extends to the outermost isolation valve. External leakage resulting from leakage past the inner isolation valve would be present for identification by the VT-2 examination. Leakage that would be present at 2235 psig

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would still be present at lower pressures, only at a reduced rate, so would be present for identification by the VT-2 examination. Additionally, all the components on this list are part of the Boric Acid Corrosion Control Program (BACCP) walk-down performed at the beginning of each outage. Since all these systems are borated, and borated water leakage leaves boron residue, the signs of leakage would be present during the BACCP walk-down.

Callaway has experienced Outer Diameter Stress Corrosion Cracking (ODSCC) on the Class 2 portion of Auxiliary Spray. The affected pipe has been replaced and additional examinations, including on the Class 1 portion of Auxiliary Spray, have not found further signs of ODSCC. In addition, the pipe-to-valve weld (line BG-027-BCA to BBV0084) for the inboard isolation valve is volumetrically examined as part of Callaway's ISI program.

BB Drain line BB-074-BCA-2" experienced a fatigue failure 1995 in the non-isolable, Class 1 portion, and this section of pipe was replaced. The non-isolable, Class 1 portions of drain lines BB-020-BCA-2", BB-037-BCA-2", and BB-074-BCA-2" are now volumetrically examined as part of an augmented ISI program in accordance with MRP-146 program.

6. Duration of Proposed Alternative

Relief is requested for the remainder of the third ten-year ISI Interval that ends on December 18, 2014.

7. References

ASME Code Case N-798, "Alternative Pressure Testing Requirements for Class 1 Piping Between the First and Second Vent, Drain, and Test Isolation Devices. Section XI, Division 1"

ASME Code Case N-800, "Alternative Pressure Testing Requirements for Class 1 Piping Between the First and Second Injection Valves. Section XI, Division 1"

Similar Relief Requests:

South Texas Project, Units 1 and 2. Relief Request Number RR-ENG-3-06, approved by NRC letter dated August 28, 2012; Accession Number ML12235A347

Catawba Nuclear Station, Units 1 and 2. Relief Request Number 11-CN-002, approved by NRC letter dated August 14, 2012; Accession Number ML12223A197.

Davis-Besse Nuclear Power Station, Unit 1. Relief Request Number RR-A35, approved by NRC letter dated April 9, 2012; Accession Number ML120750481.

Millstone Power Station, Unit 2. Relief Request Number RR-04-04, approved by NRC letter dated July 27, 2011; Accession Number ML111881029.

McGuire Nuclear Station, Units 1 and 2. Relief Request Number 09-MN-005, approved by NRC letter dated June 14, 2010; Accession Number ML101580422.

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8. Attachments

The components covered in this request are highlighted in the following drawings:

M-22BB01

M-22BB02

M-22BG01

M-22EJ01

M-22EM01

M-22EM02