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10 CFR 50.55a

NLS2019034
June 28, 2019

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Subject: 10 CFR 50.55a Relief Request RP5-02 and RI5-02, Revision 2
Cooper Nuclear Station, Docket No. 50-298, License No. DPR-46

Dear Sir or Madam:

The purpose of this letter is for the Nebraska Public Power District (NPPD) to request that the Nuclear Regulatory Commission grant relief from, and authorize alternative to, inservice inspection code requirements for the Cooper Nuclear Station (CNS) pursuant to 10 CFR 50.55a. The 10 CFR 50.55a requests pertain to inservice examination test requirements in Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code.

Relief Request RP5-02 and RI5-02, Revision 2, attached to this letter, will be used for the duration of the fifth ten-year inservice inspection interval. NPPD requests approval of these requests by June 30, 2020.

This letter contains no regulatory commitments.

Should you have any questions concerning this matter, please contact David Van Der Kamp, Acting Licensing Manager, at (402) 825-2904.

Sincerely,

John Dent, Jr.
Vice President - Nuclear and
Chief Nuclear Officer

/dv

Attachment: 1. 10 CFR 50.55a Relief Request RP5-02, Definition of Pressure Retaining Boundary for System Leakage Test
2. 10 CFR 50.55a Relief Request RI5-02, Revision 2

A047
NRR

cc: Regional Administrator w/ attachments
USNRC - Region IV

Cooper Project Manager w/ attachments
USNRC - NRR Plant Licensing Branch IV

Senior Resident Inspector w/ attachments
USNRC - CNS

NPG Distribution w/o attachments

CNS Records w/ attachments

10 CFR 50.55a Relief Request RP5-02
Definition of Pressure Retaining Boundary for System Leakage Test

Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)
Hardship without a Compensating Increase in Quality or Safety

American Society of Mechanical Engineers (ASME) Code Component(s) Affected

Code Class:	1
Examination Category:	B-P
Item Number:	B15.10
Component Numbers:	All Components Subject to Pressurization During a System Leakage Test

Applicable Code Edition and Addenda

ASME Code Section XI, 2007 Edition, 2008 Addenda

Applicable Code Requirement

Paragraph IWB-5222(a)

Article IWB-5000, "System Pressure Tests," Sub-subarticle IWB-5220, "System Leakage Test," Paragraph IWB-5222, "Boundaries," states that:

a) The pressure retaining boundary during the system leakage test shall correspond to the reactor coolant boundary, with all valves in the position required for normal reactor operation startup. The visual examination shall, however, extend to and include the second closed valve at the boundary extremity.

b) The Class 1 pressure retaining boundary which is not pressurized when the system valves are in the position required for normal reactor startup shall be pressurized and examined at or near the end of the inspection interval. This boundary may be tested in its entirety or in portions and testing may be performed during the testing of the boundary of IWB-5222(a).

Table IWB-2500-1, Examination Category B-P, Note 2 states that:

> The system leakage test (IWB-5220) shall be conducted prior to plant startup following a reactor refueling outage.

Reason for Request

Pursuant to 10 CFR 50.55a, "Codes and Standards," Paragraph (z)(2), relief is requested from the requirements of ASME Code Section XI requirements for performing a system leakage test using

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Definition of Pressure Retaining Boundary for System Leakage Test

the boundaries stated in Paragraph IWB-5222(a) because performing the pressure test with this boundary would result in a hardship without a compensating increase in quality and safety due to excessive radiation exposure and personnel safety concerns (temperature levels in the drywell).

To obtain normal operating pressure with all valves in the position for normal reactor operation startup, the reactor must be in startup with the core critical. However, 10 CFR Part 50, Appendix G requires pressure tests and leak tests of the reactor vessel that are required by ASME Section XI, to be completed before the core is critical.

Proposed Alternative and Basis for Use

In lieu of a system leakage test with all valves in the position required for normal reactor operation startup, as required by IWB-5222(a), a system pressure test is performed at the pressure associated with 100% rated reactor power with the following valve positions:

a) The outboard reactor feedwater (RF) check valves and the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) injection check valves are the Class I boundary valves and are closed for this test. The RF check valves are normally open for reactor startup. The inboard RF check valve (RF-CV-16CV) on one feedwater line is kept open by Reactor Water Cleanup (RWCU) flow. The RWCU system is kept in service during the pressure tests. Thus, the outboard RF check valve and the RClC injection check valve on this line will be pressurized during this test. The portion of piping between the other two RF check valves, including the HPCI injection line, will not be pressurized.

b) The four outboard Main Steam Isolation Valves (MSIV) will be closed for the system pressure test and the ten-year system pressure test [IWB-5222(b)]. The inboard MSIVs are opened to pressurize the system to the outboard valves. Both Main Steam drain valves are normally open to facilitate pressure control, however, the outboard Class 1 boundary valve may be closed to provide leakage isolation, if needed. The outboard valves are the Class 1 boundary valves.

c) Both HPCI and both RClC steam supply valves will be closed for the system pressure test following a refueling outage. These valves close automatically on low steam supply pressure. During the ten-year system pressure test [IWB- 5222(b)], the system will be pressurized to the outboard valves. The outboard valves are the Class 1 boundary valves.

The positions of the valves for the system leakage test as described above and as listed in Tables 1 and 2 are consistent with the intent of IWB-5222(a). Abnormal lineups and installation of jumpers are not required for the system leakage test. The valves described above are normally open during a reactor startup. In order to pressurize the reactor coolant pressure boundary for testing, these valves must be closed. Except as described above, the Class I boundary is pressurized as required by the code. The VT-2 inspection includes the entire reactor coolant pressure boundary.

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Definition of Pressure Retaining Boundary for System Leakage Test

For the portions of piping operated at or above reactor pressure during normal operation that are not at test pressure, defense-in-depth for detection of possible through-wall leakage is provided by the following:

- The temperature alarm subsystem of the leak detection system is comprised of temperature sensing elements installed in the vicinity of residual heat removal system, RWCU system, HPCI system, RCIC system, and main steam lines (MS), and temperature switches that actuate annunciators in the Control Room. It is designed to detect leaks in the major steam piping system, especially in remote or enclosed areas such as the steam tunnel. If a steam or water leak occurs, the temperature element would sense a rise in ambient temperature and cause an alarm in the Control Room. In addition, the continuous temperature signals are transmitted to the Plant Management Information System computer for the Safety Parameter Display System display.

- Control Room operators monitor Main Steam Tunnel temperatures twice per shift and record in Operations log when temperature exceeds 160 degrees Fahrenheit.

- Drywell unidentified and identified leak rates are monitored in accordance with Operations daily surveillance log every eight (8) hours.

Performing a system pressure test at 100% reactor power would result in a hardship without a compensating increase in quality and safety. At 100%, power primary containment is inerted and radiation levels are high. The proposed alternative provides reasonable assurance of operational readiness of the subject components.

In summary, three of the RF check valves, HPCI injection check valve, the outboard MSIVs, and the HPCI and RCIC steam supply valves will be closed during the system leakage test, but will be included in the VT-2 visual examination. A VT-2 examination will be performed during the system leakage test at a pressure not less than that associated with 100% rated reactor power and will provide reasonable assurance of the continued operational readiness of mechanical connections, extending to the Class 1 boundary. In addition, once at or near the end of the inspection interval, the system leakage test shall extend to the Class 1 boundary as required by IWB-5222(b).

Based on the above, Nebraska Public Power District requests relief from the ASME Section XI requirements for performing a system leakage test using the boundaries stated in IWB-5222(a).

Duration of Proposed Alternative

This proposed alternative will be applied for the duration of the fifth ten-year inservice inspection interval.

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Precedents

PR-02 was previously approved by the Nuclear Regulatory Commission (NRC) for the fourth ten-year interval for Cooper Nuclear Station (CNS) on October 2, 2006. (ML062260195)

PR5-02 was emergently approved by the NRC, for the CNS refueling outage RE-30 only, on November 5, 2018 (ML18311A319). Written approval was received April 29, 2019. (ML19092A140)

References

1. Letter to U.S. Nuclear Regulatory Commission from Randall K. Edington (Nebraska Public Power District) dated February 23, 2006, "10 CFR 50.55a Requests for the Fourth Ten-Year Inservice Inspection Interval." (ML060590300)

2. Letter to U.S. Nuclear Regulatory Commission from Randall K. Edington (Nebraska Public Power District) dated June 15, 2006, "Revision of Relief Request PR-02." (ML061710101)

3. U.S. Nuclear Regulatory Commission letter to Nebraska Public Power District dated October 2, 2006, "Cooper Nuclear Station RE: Fourth 10-Year Interval Inservice Inspection Request for Relief No. PR-02." (ML062260195)

4. Letter to U.S. Nuclear Regulatory Commission from John Dent, Jr. (Nebraska Public Power District) dated November 5, 2018, "10 CFR 50.55a Relief Request PR5-02." (ML18313A092)

5. U.S. Nuclear Regulatory Commission email to Nebraska Public Power District dated November 6, 2018, "Cooper Nuclear Station - Verbal Authorization of Relief Request PR5-02." (ML18311A319)

6. Letter to U.S. Nuclear Regulatory Commission from John Dent, Jr. (Nebraska Public Power District) dated November 8, 2018, "10 CFR 50.55a Relief Request PR5-02 Supplement." (ML18319A095)

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Definition of Pressure Retaining Boundary for System Leakage Test

Table 1: Valves not in position required for normal reactor startup:

Valve	Description	Position Required for Normal Reactor Startup	Position During System Leakage Test
RF-CV-13CV	Outboard Feedwater Check Valve	Open	Closed
RF-CV-14CV	Inboard Feedwater Check Valve	Open	Closed
RF-CV-15CV	Outboard Feedwater Check Valve	Open	Closed
MS-AOV-AO86A	Outboard Main Steam Isolation Valve	Open	Closed
MS-AOV-AO86B	Outboard Main Steam Isolation Valve	Open	Closed
MS-AOV-AO86C	Outboard Main Steam Isolation Valve	Open	Closed
MS-AOV-AO86D	Outboard Main Steam Isolation Valve	Open	Closed
HPCI-MOV-MO15	Inboard HPCI Steam Supply	Open	Closed
HPCI-MOV-MO16	Outboard HPCI Steam Supply	Open	Closed
RCIC-MOV-MO15	Inboard RCIC Steam Supply	Open	Closed
RCIC-MOV-MO16	Outboard RCIC Steam Supply	Open	Closed

Table 2: Other valves discussed in Relief Request:

Valve	Description	Position Required for Normal Reactor Startup	Position During System Leakage Test
MS-MOV-MO74	Inboard Main Steam Drain Valve	Open/Closed	Open
MS-MOV-MO77	Outboard Main Steam Drain Valve	Open/Closed	Open/Closed
HPCI-CV-29CV	HPCI Injection Check Valve	Closed	Closed
RF-CV-16CV	Inboard Feedwater Check Valve	Open	Open

10 CFR 50.55a Relief Request RI5-02, Revision 2

Revision to Relief Request RI5-02, Revision 1 Associated with Implementation of BWRVIP Documents in Lieu of Specific ASME Code Requirements on Reactor Pressure Vessel Internals and Components Inspection In Accordance with 10 CFR 50.55a(z)(1)

Reason for Request

Pursuant to 10 CFR 50.55a(z)(1), a revision is requested to the Nuclear Regulatory Commission (NRC) previously approved Cooper Nuclear Station (CNS) relief request RI5-02, Revision 1 (Reference 3) associated with the use of the Boiling Water Reactor Vessel and Internals Project (BWRVIP) guidelines in lieu of specific American Society of Mechanical Engineers (ASME) Code requirements on Reactor Pressure Vessel internals and components inspection. Since the issuance of the NRC Safety Evaluation Report, revisions to BWRVIP documents have occurred. BWRVIP-41, Revision 4-A (Reference 1) and BWRVIP-94NP, Revision 3 (Reference 2) have been issued. Nebraska Public Power District (NPPD) is requesting approval to use the latest NRC/BWRVIP approved documents in place of the document revisions cited in the Safety Evaluation Report on the basis that these approved BWRVIP documents provide an acceptable level of quality and safety.

The BWRVIP guidelines have recommended aggressive specific inspection by Boiling Water Reactor (BWR) operators to identify material condition issues with BWR components. A wealth of inspection data has been gathered during these inspections across the BWR industry. These guidelines focus on specific and susceptible components, specify appropriate inspection methods capable of identifying anticipated degradation mechanisms, and require re-examination at conservative intervals. In contrast, the code inspection requirements were prepared before the BWRVIP initiative and have not evolved with BWR inspection experience.

Proposed Revision

NPPD submitted relief request RI5-02, Revision 1 proposing to use the BWRVIP guidelines as an alternative to the requirements of Section XI of the ASME Code for the inservice inspection of the Reactor Pressure Vessel interior surfaces, attachments, and core support structures. RI5-02, Revision 1 has been approved by the NRC with specific revisions of BWRVIP documents listed. The Safety Evaluation Report restricts the use of the relief request benefits to the BWRVIP document revisions specifically addressed within the relief request submittal. In the time since the staff's approval of NPPD's proposed alternative, BWRVIP-41 has been revised by the BWRVIP and approved by the NRC. BWRVIP-94NP is an administrative document that has also been revised and approved by the BWRVIP Executive Committee. NPPD requests that the latest NRC approved revision of BWRVIP-41 and the latest BWRVIP Executive Committee approved revision of BWRVIP-94 be used as an alternative to the revisions currently listed in the referenced Safety Evaluation Report.

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References

1. BWRVIP-41, Revision 4-A: BWR Vessel and Internals Project BWR Jet Pump Assembly Inspection and Flaw Evaluation Guidelines. EPRI, Palo Alto, California: 3002014254, dated December 2018.

2. BWRVIP-94NP, Revision 3, BWR Vessel and Internals Project Program Implementation Guide. EPRI, Palo Alto, California: 3002013101, dated September 2018.

3. U.S. Nuclear Regulatory Commission letter to Nebraska Public Power District dated July 31, 2018, "Cooper Nuclear Station - Requests for Relief Associated with the Fifth 10-Year Inservice Inspection Interval Program." (ML18183A325)

Precedents

1. Letter to U.S. Nuclear Regulatory Commission from James Barstow (Exelon Generation Company, LLC) dated February 19, 2019, "Revision to Relief Requests Associated with the Use of the BWRVIP Guidelines in Lieu of Specific ASME Code Requirements on Reactor Pressure Vessel Internals and Components Inspection." (ML19050A363)

2. U.S. Nuclear Regulatory Commission letter to Exelon Generation Company, LLC, dated April 30, 2019, "Clinton Power Station, Unit No. 1; Dresden Nuclear Power Station, Units 2 and 3; James A. Fitzpatrick Nuclear Power Plant; LaSalle County Station, Units 1 and 2; Limerick Generating Station, Units 1 and 2; Peach Bottom Atomic Power Station, Units 2 and 3; and Quad Cities Nuclear Power Station, Units 1 and 2 - Revision to Approved Alternatives to Use Boiling Water Reactor Vessel and Internals Project Guidelines." (ML19098A034)

Table 1
Updated BWRVIP Revisions

CNS Safety Evaluation ADAMS Accession No.	Listed BWRVIP-41 Revision	Requested BWRVIP-41 Revision	Listed BWRVIP-94NP Revision	Requested BWRVIP-94NP Revision
ML18183A325	3	4-A	2	3