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NLS2018011

March 8, 2018

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

Subject: Response to Nuclear Regulatory Commission Request for Additional Information
for Relief Requests RR5-02 and RR5-03
Cooper Nuclear Station, Docket No. 50-298, DPR-46

- References:**
1. Email from Thomas Wengert, U.S. Nuclear Regulatory Commission, to Jim Shaw, Nebraska Public Power District, dated February 06, 2018, "Cooper Nuclear Station - Final RAI RE: Relief Requests RR-02 and RR-03 (EPIDs L-2017-LRR-065 and -066)"
 2. Letter from John Dent, Jr., Nebraska Public Power District, to the U.S. Nuclear Regulatory Commission, dated August 17, 2017, "10 CFR 50.55a Relief Requests for Fifth Ten-Year Inservice Inspection Interval" (ML17241A048)

Dear Sir or Madam:

The purpose of this letter is for the Nebraska Public Power District to respond to the Nuclear Regulatory Commission's Request for Additional Information (RAI) (Reference 1) related to the Cooper Nuclear Station (CNS) Relief Requests RR5-02 and RR5-03 (Reference 2).

The responses to the specific RAI questions for Relief Request RR5-02 are provided in Attachment 1 to this letter. Attachment 2 contains a revised Relief Request RR5-02. The response to the RAIs for RR5-03 will be provided by May 17, 2018, as discussed with the Nuclear Reactor Regulation Project Manager for CNS.

This letter does not contain any new regulatory commitments.

If you have any questions concerning this matter, please contact Jim Shaw, Licensing Manager, at (402) 825-2788.

A047
NRR

Sincerely,

 K Hold MDK for John Dent 3/8/2018

John Dent, Jr.

Vice President - Nuclear
and Chief Nuclear Officer

/dv

Attachments: 1) Response to Nuclear Regulatory Commission Request for Additional
Information for Relief Request RR5-02

2) Revised Relief Request RR5-02

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

Attachment 1

**Response to Nuclear Regulatory Commission Request for
Additional Information for Relief Request RR5-02**

Cooper Nuclear Station, Docket No. 50-298, DPR-46

The Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) regarding Relief Request RR5-02 is shown in italics. The Nebraska Public Power District (NPPD) response to the request is shown in normal font.

RAI RR5-02-1

Code Case N-513-4, Paragraph 5(a) requires, in part, that "A sample size of at least five of the most susceptible and accessible locations, or, if fewer than five, all susceptible and accessible locations shall be examined within 30 days of detecting the flaw..." Paragraph 5(b) requires that "...When a flaw is detected, an additional sample of the same size as defined in paragraph 5(a) shall be examined..."

On Page 61 of the attachment to the August 17, 2017 submittal, the licensee states the following, in part:

CNS will follow all requirements of Code Case N-513-4. With regard to augmented examination process as described in Section 5 of the Code Case, a sample size of at least five of the most susceptible and accessible locations shall be examined within 30 days of detecting the original flaw. The intent of this requirement is to identify the extent of condition that exists within similar system piping that could also be susceptible to similar flaws.

Specific to the CNS SW Class 3 piping, if a single flaw is identified within 30 days of scheduled volumetric examinations, CNS may take credit for any previous examination if performed prior to identification of the flaw, as a part of the same set of inspections. Credit will be taken for these examinations to meet the requirements of Code Case N-513-4 paragraph 5(a), provided that the examination meets the inspection method requirements of the Code Case and was performed on SW Class 3 piping components, the inspected segments are of the same design and operation, and the inspected segments are considered to be of the most susceptible and accessible locations determined from the engineering evaluation. This is consistent with the augmented examination approach in [Generic Letter (GL)] 90-05 as well as previous NRC approved versions of N-513.

In the submittal the licensee appears to convey that if a single flaw is identified, the licensee will examine a fewer number of pipe locations than required by paragraphs 5(a) and 5(b) of Code Case N-513-4, because the licensee proposes to take credit for examinations performed within 30 days prior to identification of the flaw. The NRC staff's understanding of paragraph 5(a) is that within 30 days after a flaw is identified, augmented examinations must be performed. The

Code Case does not imply that credit may be taken for previously performed examinations. In addition, GL 90-05, does not imply that previously performed examinations may be credited toward augmented examinations performed after a flaw is identified.

- (a) *Clarify whether the proposed use of Code Case N-513-4 will examine the same number of pipe locations as required by paragraph 5(a). If not, provide justification.*
- (b) *Clarify whether the above proposed use of Code Case N-513-4 will meet paragraph 5(b). If not, provide justification.*

NPPD Response:

- (a) NPPD will examine the same number of pipe locations as required by 5(a). NPPD withdraws our request to credit examinations conducted within the 30 days prior to finding a flaw as augmented examination. Therefore, Attachment 2 contains a revised Relief Request RR5-02 that removes paragraph 2 on page 61 of the attachment to the August 17, 2017 NPPD submittal.
- (b) NPPD will examine additional locations as specified in the requirements of 5(b) as it applies to 5(a).

RAI RR5-02-2

On Page 61 of the attachment to the August 17, 2017 submittal, the licensee states the following, in part:

... NPPD will apply ASME Code Case N-513-4 in its entirety along with RG 1.147, Revision 17 (or later NRC defined revision as applicable) for evaluation of Class 2 and 3 piping flaws at CNS if Code repairs cannot reasonably be completed within the Technical Specifications required time limit. ... (underline added)

The NRC staff notes that Regulatory Guide (RG) 1.147, Revision 17 does not reference Code Case N-513-4. Code Case N-513-3 is listed in RG 1.147 with one condition. However, this condition has been addressed in Code Case N-513-4. Clarify if the intent of the statement above is that when Code Case N-513-4 is listed in a subsequent revision of RG 1.147, the licensee intends to utilize the Code Case in accordance with RG 1.147, including any conditions that may be placed on the Code Case by the NRC.

NPPD Response:

Relief Request RR5-02 (Attachment 2) has been revised to remove the reference to RG 1.147 from the paragraph cited in RAI RR5-02 (shown below with strikeouts) :

... NPPD will apply ASME Code Case N-513-4 in its entirety ~~along with RG 1.147, Revision 17 (or later NRC defined revision as applicable)~~ for evaluation of Class 2 and 3

piping flaws at CNS if Code repairs cannot reasonably be completed within the Technical Specifications required time limit. ...

While not stated in the Relief Request, if or when the NRC approves Code Case N-513-4 in a later edition of RG 1.147, NPPD will follow ASME Code Case N-513-4 in its entirety, including conditions that may be placed on the Code Case by the NRC.

Attachment 2

Revised Relief Request RR5-02

Cooper Nuclear Station, Docket No. 50-298, DPR-46

**10CFR50.55a Request No. RR5-02
Cooper Nuclear Station Request to Use Code Case N-513-4**

**Proposed Alternative in Accordance with 10 CFR 50.55a(z)(2)
Hardship Without a Compensating Increase in Quality and Safety**

ASME Code Component(s) Affected

All ASME, Section XI, Class 2 and 3 piping components that meet the operational and configuration limitations of Code Case N-513-4, paragraphs 1(a), 1(b), 1(c), and 1(d) at CNS.

Applicable Code Edition and Addenda

CNS applicable Code for the fifth 10-year ISI interval and the ISI program is the 2007 Edition of Section XI with the 2008 Addenda. CNS fifth interval started April 1, 2016 and ends February 28, 2026.

Applicable ASME Code Requirements

ASME Code, Section XI, IWC-3120 and IWC-3130 require that flaws exceeding the defined acceptance criteria be corrected by repair/replacement activities or evaluated and accepted by analytical evaluation. ASME Code, Section XI, IWD-3120(b) requires that components exceeding the acceptance standards of IWD-3400 be subject to supplemental examination, or to a repair/replacement activity.

Reason for Request

In accordance with 10 CFR 50.55a(z)(2), NPPD is requesting a proposed alternative from the requirement to perform repair/replacement activities for degraded Class 2 and 3 piping whose maximum operating temperature does not exceed 200° and whose maximum operating pressure does not exceed 275 psig. Moderately degraded piping could require a plant shutdown within the required action statement timeframes to repair observed degradation. Plant shutdown activities result in additional dose and plant risk that would be inappropriate when a degraded condition is demonstrated to retain adequate margin to complete the component's function. The use of an acceptable alternative analysis method in lieu of immediate action for a degraded condition will allow NPPD to perform additional extent of condition examinations on the affected systems while allowing time for safe and orderly long term repair actions if necessary. Actions to remove degraded piping from service could have a detrimental overall risk impact by requiring a plant shutdown, thus requiring use of a system that is in standby during normal operation. Accordingly, compliance with the current code requirements results in a hardship without a compensating increase in the level of quality and safety.

ASME Code Case N-513-3 does not allow evaluation of flaws located away from attaching circumferential piping welds that are in elbows, bent pipe, reducers, expanders, and branch tees. ASME Code Case N-513-3 also does not allow evaluation of flaws located in heat exchanger

**10CFR50.55a Request No. RR5-02
Cooper Nuclear Station Request to Use Code Case N-513-4**

external tubing or piping. ASME Code Case N-513-4 provides guidance for evaluation of flaws in these locations.

Proposed Alternative and Basis for Use

NPPD is requesting approval to apply ASME Code Case N-513-4, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1," to the SW System piping that meets the operational and configuration limitations of Code Case N-513-4, paragraphs 1(a), 1(b), 1(c), and 1(d). Application of the Code Case will avoid accruing additional personnel radiation exposure and increased plant risk associated with a plant shutdown to comply with the cited Code requirements.

The NRC issued GL 90-05 (Reference 1), "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping (Generic Letter 90-05)," to address the acceptability of limited degradation in moderate energy piping. The generic letter defines conditions that would be acceptable to utilize temporary non-code repairs with NRC approval. The ASME recognized that relatively small flaws could remain in service without risk to the structural integrity of a piping system and developed Code Case N-513. NRC approval of Code Case N-513 versions in RG 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1 (Reference 3)," allows temporary acceptance of partial through-wall or through-wall flaws provided all conditions of the Code Case and NRC conditions are met. The temporary acceptance period has historically been the time to the next scheduled refueling outage. The Code Case also requires the Owner to demonstrate system operability due to leakage.

The ASME recognized that the limitations in Code Case N-513-3 were preventing needed use in piping components such as elbows, bent pipe, reducers, expanders, and branch tees and external tubing or piping attached to heat exchangers. Code Case N-513-4 was approved by the ASME to expand use on these locations and to revise several other areas of the Code Case. Enclosure 1, Attachment 1 provides a marked-up N-513-3 version of the Code Case to highlight the changes compared to the NRC approved N-513-3 version. The following provides a high level overview of the Code Case N-513-4 changes:

- Revised the maximum allowed time of use from no longer than 26 months to the next scheduled refueling outage.
- Added applicability to piping elbows, bent pipe, reducers, expanders, and branch tees where the flaw is located more than $(R_{ot})^{1/2}$ from the centerline of the attaching circumferential piping weld.
- Expanded use to external tubing or piping attached to heat exchangers.
- Revised to limit the use to liquid systems.
- Revised to clarify treatment of Service Level load combinations.

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Cooper Nuclear Station Request to Use Code Case N-513-4

- Revised to address treatment of flaws in austenitic pipe flux welds.
- Revised to require minimum wall thickness acceptance criteria to consider longitudinal stress in addition to hoop stress.
- Other minor editorial changes to improve the clarity of the Code Case.

The technical basis for changes in Code Case N-513-4 when compared to NRC approved Code Case N-513-3 is provided in Enclosure 1, Attachment 2. Enclosure 1, Attachment 3 provides additional technical justification for the use of Code Case N-513-4 at CNS.

The design basis is considered for each leak and evaluated using the NPPD Operability Evaluation process. The evaluation process must consider requirements or commitments established for the system, continued degradation and potential consequences, operating experience, and engineering judgment. As required by the Code Case, the evaluation process considers but is not limited to system make-up capacity, containment integrity with the leak not isolated, effects on adjacent equipment, and the potential for room flooding.

Leakage rate is not typically a good indicator of overall structural stability in moderate energy systems, where the allowable through-wall flaw sizes are often on the order of inches. The periodic inspection interval defined using paragraph 2(e) of Code Case N-513-4 provides evidence that a leaking flaw continues to meet the flaw acceptance criteria and that the flaw growth rate is such that the flaw will not grow to an unacceptable size.

The effects of leakage may impact the operability determination or the plant flooding analyses specified in paragraph 1(f). For a leaking flaw, the allowable leakage rate will be determined by dividing the critical leakage rate by a safety factor of four (4). The critical leakage rate is determined as the lowest leakage rate that can be tolerated and may be based on the allowable loss of inventory or the maximum leakage that can be tolerated relative to room flooding, among others. The safety factor of four (4) on leakage is based upon Code Case N-705 (Reference 2), which is accepted without condition in RG 1.147, Revision 17. Paragraph 2.2(e) of N-705 requires a safety factor of two (2) on flaw size when estimating the flaw size from the leakage rate. This corresponds to a safety factor of four (4) on leakage for nonplanar flaws. Although the use of a safety factor for determination of an unknown flaw is considered conservative when the actual flaw size is known, this approach is deemed acceptable based upon the precedent of Code Case N-705. Note that the alternative herein does not propose to use any portion of Code Case N-705 and that citation of N-705 is intended only to provide technical basis for the safety factor on leakage.

During the temporary acceptance period, leaking flaws will be monitored daily as required by paragraph 2(f) of Code Case N-513-4 to confirm the analysis conditions used in the evaluation remain valid. Significant change in the leakage rate is reason to question that the analysis

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Cooper Nuclear Station Request to Use Code Case N-513-4**

conditions remain valid, and would require re-inspection per paragraph 2(f) of the Code Case. Any re-inspection must be performed in accordance with paragraph 2(a) of the Code Case.

The leakage limit provides quantitative measurable limits which ensure the operability of the system and early identification of issues that could erode defense-in-depth and lead to adverse consequences.

In summary, NPPD will apply ASME Code Case N-513-4 in its entirety for evaluation of Class 2 and 3 piping flaws at CNS if Code repairs cannot reasonably be completed within the Technical Specifications required time limit. Code Case N-513-4 utilizes technical evaluation approaches that are based on principals that are accepted in other Code documents already acceptable to the NRC. The application of this Code Case will maintain acceptable structural and leakage integrity while minimizing plant risk and personnel exposure by minimizing the number of plant transients that could be incurred if degradation is required to be repaired based on ASME Section XI acceptance criteria only.

Duration of Proposed Alternative

The proposed alternative is for use of Code Case N-513-4 for Class 2 and 3 piping and components within the scope of the Code Case and the request herein. A Section XI compliant repair/replacement will be completed prior to exceeding the next scheduled refueling outage or allowable flaw size, whichever comes first. This relief request will be applied for the duration of the fifth 10-year inservice inspection interval. If a flaw is evaluated near the end of the interval and the next refueling outage is in the subsequent interval, the flaw may remain in service under this relief request until the next refueling outage.

Precedent

US NRC letter to Exelon Generation Company Nuclear Fleet - "...Proposed Alternative to Use ASME Code Case N-513-4," NRC Safety Evaluation dated September 6, 2016 (ML16230A237).

References

1. NRC Generic Letter 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping (Generic Letter 90-05)," dated June 15, 1990.
2. ASME Boiler and Pressure Vessel Code, Code Case N-705, "Evaluation Criteria for Temporary Acceptance of Degradation in Moderate Energy Class 2 or 3 Vessels and Tanks Section XI, Division 1," dated October 12, 2006.
3. NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1, Revision 17," dated August 2014.