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November 29, 2017

L-XE-17-006  
10 CFR 50.55a

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

Prairie Island Nuclear Generating Plant,  
Units 1 and 2  
Docket 50-282 and 50-306  
Renewed Facility Operating License Nos.  
DPR-42 and DPR-60

Monticello Nuclear Generating Plant  
Docket 50-263  
Renewed Facility Operating License  
No. DPR-22

Proposed Alternative to Utilize Code Case N-513-4, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1"

Pursuant to 10 CFR 50.55a(z)(2), Northern States Power Company, a Minnesota Corporation (NSPM), doing business as Xcel Energy, is requesting a proposed alternative to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," on the basis that compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Specifically, NSPM is requesting to apply the evaluation methods of 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 Class 2 and 3 moderate energy piping including elbows, bent pipe, reducers, expanders, and branch tees.

We request your review and approval of this multi-site request by November 29, 2018.

If you have any questions, please contact Lenny Sueper, (612) 330-6917.

Summary of Commitments

This letter makes no new commitments and no revisions to existing commitments.

  
Martin C. Murphy  
Director, Nuclear Licensing and Regulatory Services  
Northern States Power Company – Minnesota

Enclosures:

1. 10 CFR 50.55a Request to Use ASME Code Case N-513-4
2. 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
3. Technical Basis for Proposed Fourth Revision to ASME Code Case N-513

cc: Administrator, Region III, USNRC  
Project Manager, Monticello, USNRC  
Project Manager, Prairie Island, USNRC  
Resident Inspector, Monticello, USNRC  
Resident Inspector, Prairie Island, USNRC

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**10 CFR 50.55a REQUEST:  
Monticello – RR-011  
Prairie Island – 1-RR-5-8, 2-RR-5-8**

**Request to Use Code Case N-513-4 in  
Accordance with 10 CFR 50.55a(z)(2)**

**1. ASME Code Component(s) Affected:**

All American Society of Mechanical Engineers (ASME), Section XI, Class 2 and 3 components that meet the operational and configuration limitations of 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," paragraphs 1(a), 1(b), 1(c), and 1(d).

**2. Applicable Code Edition and Addenda:**

<b><u>Plant</u></b>	<b><u>Interval</u></b>	<b><u>Edition</u></b>	<b><u>Start</u></b>	<b><u>End</u></b>
Monticello Nuclear Generating Plant	Fifth	2007 Edition through 2008 Addenda	September 1, 2012	May 31, 2022
Prairie Island Unit 1	Fifth	2007 Edition through 2008 Addenda	December 21, 2014	December 20, 2024
Prairie Island Unit 2	Fifth	2007 Edition through 2008 Addenda	December 21, 2014	December 20, 2024

**3. Applicable Code Requirement:**

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.

**4. Reason for Request:**

In accordance with 10 CFR 50.55a(z)(2), Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), 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 degrees F 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

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observed degradation. Plant shutdown activities result in additional 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 NSPM 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. 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, as conditionally approved in Regulatory Guide 1.147, Revision 17, 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 external tubing or piping. ASME Code Case N-513-4 provides guidance for evaluation of flaws in these locations.

### **5. Proposed Alternative and Basis for Use:**

NSPM is requesting approval to apply the evaluation methods of 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 Class 2 and 3 components that meet the operational and configuration conditions of Code Case N-513-4. The NRC issued Generic Letter 90-05, "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. NRC conditionally approved Code Case N-513-3 in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," to allow acceptance of partial through-wall or through-wall leaks for an operating cycle provided all conditions of the Code Case and NRC conditions are met.

The design basis is considered for each leak and evaluated using the NSPM operability determination and functionality assessment process. The evaluation process must consider requirements or commitments established for the system, continued degradation and potential consequences, operating experience, and engineering judgment. 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.

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 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.

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The NRC issued Generic Letter, "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 Regulatory Guide 1.147 allows temporary acceptance of partial through-wall or through-wall leaks for an operating cycle provided all conditions of the code case and NRC conditions are met. The code case also requires the owner to demonstrate system operability considering effects of leakage.

The ASME recognized that the limitations in ASME 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. The following provides a high level overview of the Code Case N-513-4 changes:

- 1) Revised the maximum allowed time of use from no longer than 26 months to the next scheduled refueling outage.
- 2) Added applicability to piping elbows, bent pipe, reducers, expanders, and branch tees where the flaw is located more than  $(R_o t)^{1/2}$  from the centerline of the attaching circumferential piping weld.
- 3) Expanded use to external tubing or piping attached to heat exchangers.
- 4) Revised to limit the use to liquid systems.
- 5) Revised to clarify treatment of Service Level load combinations.
- 6) Revised to address treatment of flaws in austenitic pipe flux welds.
- 7) Revised to require minimum wall thickness acceptance criteria to consider longitudinal stress in addition to hoop stress.
- 8) Other minor editorial changes to improve the clarity of the Code Case.

Significant changes in Code Case N-513-4 when compared to NRC approved Code Case N-513-3 are discussed in Reference 1, Attachment 4, "Technical Basis for Proposed Fourth Revision to ASME Code Case N-513."

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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. The critical leakage rate is determined as the highest 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 on leakage is based upon 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," which is accepted without condition in Regulatory Guide 1.147, Revision 17. Paragraph 2.2(e) of Code Case N-705 requires a safety factor of two on flaw size when estimating the flaw size from the leakage rate. This corresponds to a safety factor of four 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.

The leakage rate 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, NSPM may apply ASME Code Case N-513-4 to evaluation of Class 2 and 3 components that are within the scope of the Code Case. Code Case N-513-4 utilizes technical evaluation approaches that are based on principles that are accepted in other ASME Code documents already acceptable to the NRC. The application of this code case, in concert with safety factors on leakage limits, 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 Code, Section XI acceptance criteria only.

### **6. Duration of Proposed Alternative:**

This request will be applied for the duration of the inservice inspection interval defined in Section 2 of this request or such time as the NRC approves Code Case N-513-4 in Regulatory Guide 1.147 or other document. 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 request until the next refueling outage.

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### 7. Precedence:

1. Letter from NRC to Exelon Generation Company, LLC, "Braidwood Station, Units 1 and 2; Byron Station, Unit Nos. 1 and 2; Calvert Cliffs Nuclear Power Plant, Units 1 and 2; Clinton Power Station, Unit No. 1; Dresden Nuclear Power Station, Units 2 and 3; LaSalle County Station, Units 1 and 2; Limerick Generating Station, Units 1 and 2; Nine Mile Point Nuclear Station, Units 1 and 2; Oyster Creek Nuclear Generating Station; Peach Bottom Atomic Power Station, Units 2 and 3; Quad Cities Nuclear Power Stations, Units 1 and 2; R. E. Ginna Nuclear Power Plant; and Three Mile Island Nuclear Stations, Unit 1 – Proposed Alternative to Use ASME Code Case N-513-4," dated September 6, 2016. (ADAMS Accession Number ML16230A237)