



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 28, 2010

Mr. Mr. Timothy J. O'Connor
Site Vice President
Monticello Nuclear Generating Plant
Northern States Power Company - Minnesota (NSPM)
2807 West County Road 75
Monticello, MN 55362-9637

SUBJECT: MONTICELLO NUCLEAR GENERATION PLANT (MNGP) – ALTERNATIVE
REGARDING USE OF ASME CODE CASE N-705 TO ADDRESS OBSERVED
CRACKS AT THE STANDBY LIQUID CONTROL SYSTEM TANK
(TAC NO. ME3593)

Dear Mr. O'Connor:

By letter dated April 2, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100920376), Northern States Power Company submitted Relief Request No. 18, requesting relief from certain American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) requirements to evaluate and repair the MNGP standby liquid control (SLC) tank. As an alternative to the ASME Code, Section XI, Subarticle IWC-3120, "Inservice Volumetric and Surface Examinations," the licensee proposed different evaluation and acceptance criteria that would delay repair of the throughwall flaws in the base of the SLC tank. The alternative, based on ASME Code Case N-705, "Evaluation Criteria for Temporary Acceptance of Degradation in Moderate Energy Class 2 or 3 Vessels and Tanks," and documented in Relief Request No. 18, would be used to provide the evaluation and acceptance criteria to allow continued operation of MNGP until the SLC tank is restored in accordance with Section XI of the ASME Code before startup from the next refueling outage, currently scheduled to begin in March 2011.

On April 23, 2010, the Nuclear Regulatory Commission (NRC) staff verbally authorized the proposed alternative (see phone record at ADAMS Accession No. ML101130510). This letter and enclosed safety evaluation provide follow up to the verbal authorization.

As set forth in the enclosed safety evaluation, the NRC staff concludes that the alternative proposed in Relief Request No. 18 for the evaluation and temporary acceptance criteria of leakage in the Class 2 SLC tank T-200 provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the proposed alternative set forth in the licensee's Relief Request No. 18. This authorization will remain in effect until startup from the next refueling outage, currently scheduled to begin in March 2011. All other ASME Code Section XI requirements for which relief was not specifically requested and approved in Relief Request No. 18 remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

T. J. O'Connor

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If you have any questions, please contact Mr. Peter Tam, the Monticello Project Manager, at 301-415-1451.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Pascarelli".

Robert J. Pascarelli, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-263

Enclosure:
Safety Evaluation

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

NORTHERN STATES POWER COMPANY OF MINNESOTA

MONTICELLO NUCLEAR GENERATING PLANT (MNGP)

APPLICATION OF ASME CODE CASE N-705 TO THE

STANDBY LIQUID CONTROL SYSTEM TANK

DOCKET NO. 50-263

1.0 INTRODUCTION

On March 19, 2010, Northern States Power Company – Minnesota (the licensee) discovered a white, crystalline substance at the base of the MNGP standby liquid control (SLC) tank T-200, which operates at atmospheric pressure. On March 22, 2010, the licensee reinspected the area and noted that moisture was present where the white, crystalline substance was previously found. Subsequent nondestructive evaluation revealed multiple cracks in the base plate around the circumference of the tank, one of which was longer than the others and served as a path for water to leak out of the SLC tank. The licensee has attributed this leak to transgranular stress corrosion cracking of the base plate (304 stainless steel) for the SLC tank.

By letter dated April 2, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100920376), the licensee submitted Relief Request No. 18, requesting relief from certain American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) requirements to evaluate and repair the MNGP SLC tank. As an alternative to the ASME Code, Section XI, Subarticle IWC-3120, "Inservice Volumetric and Surface Examinations," the licensee proposed different evaluation and acceptance criteria that would delay repair of the throughwall flaws in the base of the SLC tank. The alternative, based on ASME Code Case N-705, "Evaluation Criteria for Temporary Acceptance of Degradation in Moderate Energy Class 2 or 3 Vessels and Tanks," and documented in Relief Request No. 18, would be used to provide the evaluation and acceptance criteria to allow continued operation of the plant until the SLC tank is restored in accordance with Section XI of the ASME Code before startup from the next refueling outage, currently scheduled to begin in March 2011.

2.0 REGULATORY EVALUATION

The request is covered by ASME Code, Section XI, 1995 Edition through 1996 Addenda, which is the edition and addenda of the ASME Code applicable to the MNGP fourth 10-year inservice inspection interval. Additionally, for ultrasonic examinations, the licensee is implementing ASME Code, Section XI, Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," of the 1995 Edition through 1996 Addenda as required and modified by Title 10 of the *Code of Federal Regulations* Section 50.55a (10 CFR 50.55a). ASME Code,

Section XI, Subarticle IWC-3120 requires that any throughwall leaking flaw be identified and repaired so that the leak is stopped and the level of quality and safety is restored to the design requirements.

The provisions in 10 CFR 50.55a(a)(3) allow alternatives to the ASME Code, Section XI requirements when the licensee can demonstrate that:

- (i) the proposed alternatives would provide an acceptable level of quality and safety, or
- (ii) 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.

3.0 TECHNICAL EVALUATION

3.1 The Licensee's Proposed Alternative

The licensee has requested that the alternative remain in effect for the remainder of MNGP's current fuel cycle, which would end approximately March 2011.

The licensee proposed to use ASME Code Case N-705 to characterize and evaluate the leak found in the SLC tank. The provisions of the code case define the requirements needed to demonstrate the structural integrity of the SLC tank in its current condition with respect to fracture. With regards to Sections 2.2, "Degradation Characterization," and 2.4, "Bounding Flaw Evaluation," of the code case, the licensee has assumed that the radial ultrasonic indication on the outer diameter of the tank base plate is cracked to a depth that is twice the distance from the outer diameter to the toe of the weld on the inside of the tank. In addition, the licensee postulated the presence of a circumferential flaw in the cylindrical shell of the tank. Given this worst-case assumptions on the flaw in the SLC tank, the licensee performed a flaw analysis and a stress corrosion cracking analysis to demonstrate an acceptable level of quality and safety so that the plant can continue operation.

With regards to Section 6, "Subsequent Examinations and Surveillance," the code case requires:

1. daily monitoring for tank leakage, and
2. examination of the flaw to verify the predicted growth at $\frac{1}{2}$ of the allowed operating time

The licensee proposed monitoring of SLC tank leakage each day in accordance with the operator rounds to meet the first code case requirement. For the second code case requirement, based upon a flaw evaluation performed by Structural Integrity Associates, Inc., the licensee proposed no additional examination because the predicted time to reach $\frac{1}{2}$ of the allowed operating time is determined to be far more than the time to reach the end of the proposed alternative, March 2011.

Further, the licensee notes that Nuclear Regulatory Commission (NRC) draft Regulatory Guide DG-1192, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," dated June 2009, includes Code Case N-705 as acceptable for unconditional use as an alternative to Section XI.¹

3.2 NRC Staff Evaluation

As indicated in Section 2.0 above, the ASME Code would require any leaks detected in Class 2 tanks to be removed by repair/replacement. In Relief Request No. 18 the licensee proposed to apply ASME Code Case N-705 for the characterization and evaluation of the flaw that is causing the leak in the SLC tank. This will allow the licensee to continue operation with the degraded condition until the next refueling outage when the SLC tank can be repaired. In applying ASME Code Case N-705, the licensee used a conservative estimate of the existing crack size (twice the distance from the outside edge of the base to the toe of the fillet weld inside the tank, about 2.7 inches) as required for the bounding crack evaluation. The licensee has considered both radial and circumferential crack growth in the analysis of stress corrosion crack growth, and in both cases, the time for the existing crack to grow to a critical size is much larger than the duration of the proposed alternative. In addition, the licensee has agreed to monitor the leakage daily to ensure that excessive leakage does not occur.²

Further, the staff notes that although MNGP is permitted to operate per ASME Code Case N-705 with the degraded SLC tank, the degraded tank is required to be repaired or replaced during the subsequent refueling outage in accordance with the appropriate requirements of Section XI of the ASME Code. The NRC staff has approved a similar relief request for continued operation of degraded Class 2 piping components per Code Case N-513-2.³

On the basis of the above evaluation, the NRC staff finds that in lieu of the requirements of ASME Code, Section XI, IWC-3120, the proposed alternative requirements of ASME Code Case N-705 provide an acceptable level of quality and safety.

4.0 CONCLUSION

Based on the discussion above, the NRC staff concludes that the alternative proposed in Relief Request No. 18 for the evaluation and temporary acceptance criteria of leakage in the Class 2 SLC tank T-200 provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the NRC staff authorizes the proposed alternative set forth in the licensee's Relief Request No. 18. This authorization will remain in effect until startup from the next refueling outage, currently scheduled to begin in March 2011.

¹ Federal Register: June 2, 2009 (Volume 74, Number 104, Proposed Rules), "Incorporation by Reference of Regulatory Guide 1.84, Revision 35, and Regulatory Guide 1.147, Revision 16, Into 10 CFR 50.55a," pages 26303-26310.

² The definition of excessive is found in the Operability Recommendation, 1223696-01.

³ Approved alternative for Palisades, May 16, 2007 (Accession No ML071170148).

All other ASME Code Section XI requirements for which relief was not specifically requested and approved in Relief Request No. 18 remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Patrick Purtscher

Date: July 28, 2010

T. J. O'Connor

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If you have any questions, please contact Mr. Peter Tam, the Monticello Project Manager, at 301-415-1451.

Sincerely,

/RA/

Robert J. Pascarelli, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-263

Enclosure:
Safety Evaluation

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P. Purtscher, NRR

Accession No. **ML102000672**

OFFICE	LPL3-1/PM	LPL3-1/LA	CVIB/BC*	LPL3-1BC
NAME	PTam	THarris for BTully	MMitchell*	RPascarelli
DATE	7/28/10	7/27/10	7/16/10*	7/28/10

*Safety evaluation transmitted by e-mail of 7/16/10 (Accession No ML102000337).

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