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

February 8, 2011

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) – REQUEST FOR RELIEF NO. 17 REGARDING EXAMINATION OF REACTOR PRESSURE VESSEL SHELL CIRCUMFERENTIAL WELDS (TAC NO. ME3526)

Dear Mr. O'Connor:

By letter dated March 12, 2010, as supplemented by letter dated September 27, 2010, NSPM requested permanent relief from the inservice inspection requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g) for the volumetric examination of reactor pressure vessel shell circumferential welds, and proposed alternative provisions for the subject weld examinations through the end of MNGP's license renewal extended period of operation.

The Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's submittals and concludes that the licensee's alternative will provide an acceptable level of quality and safety in lieu of performing the required volumetric examinations. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) through the remainder of MNGP's license renewal extended period of operation. The NRC staff also concludes that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation of MNGP in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this alternative will not be inimical to the common defense and security or the health and safety of the public.

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

Sincerely,

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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UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

NORTHERN STATES POWER COMPANY OF MINNESOTA (NSPM)

MONTICELLO NUCLEAR GENERATING PLANT (MNGP)

FOURTH 10-YEAR INSERVICE INSPECTION PROGRAM RELIEF REQUEST NO. 17

DOCKET NO. 50-263

1.0 INTRODUCTION

The Nuclear Regulatory Commission (NRC) staff has reviewed and evaluated the information submitted by Northern States Power Company-Minnesota (NSPM, the licensee) in its letter dated March 12, 2010, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML100750661), as supplemented by letter dated September 27, 2010 (Accession No. ML102710108), which requested permanent relief from the inservice inspection (ISI) requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g) for the volumetric examination of reactor pressure vessel (RPV) shell circumferential welds through the end of the Monticello Nuclear Generating Plant (MNGP) license renewal extended period of operation. The licensee's letters provided technical justification for the request, and proposed alternate provisions for the subject weld examinations.

2.0 REGULATORY EVALUATION

ISI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Class 1, 2, and 3 components is performed in accordance with ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," and applicable addenda as required by 10 CFR 50.55a(g), except where specific relief has been granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i). The requirement at 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable ASME Code,

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Section XI, for the MNGP fourth 10-year interval ISI program is the 1995 Edition through the 1996 Addenda.

The requirement at 10 CFR 50.55a(g)(6)(ii)(A)(2) requires that all licensees augment their RPV examination by implementing once, as part of the ISI interval in effect on September 8, 1992, the examination requirements for RPV shell welds specified in Item No. B1.10, Examination Category B-A, "Pressure Retaining Welds in Reactor Vessel," of Table IWB-2500-1 to Section XI of the ASME Code. Additionally, 10 CFR 50.55a(g)(6)(ii)(A)(2) requires that the examinations cover essentially 100 percent of the RPV shell welds.

The requirement at 10 CFR 50.55a(g)(6)(ii)(A)(2) defines "essentially 100%" as used in Table IWB-2500-1 to mean more than 90 percent of the examination volume of each weld. The schedule for implementation of the augmented inspection is dependent upon the number of months remaining in the 10-year ISI interval that was in effect on September 8, 1992.

2.1 Regulatory Background

2.1.1 BWRVIP-05 Report

By letter dated September 28, 1995, as supplemented by letters dated June 24 and October 29, 1996, May 16, June 4, June 13, and December 18, 1997, and January 13, 1998, the Boiling Water Reactor Vessel and Internals Project (BWRVIP), a technical committee of the Boiling Water Reactor (BWR) Owners Group, submitted the BWRVIP-05 report, "BWR Reactor Pressure Vessel Shell Weld Inspection Recommendations," for NRC staff review. This report evaluated the current inspection requirements for RPV shell welds in BWRs, formulated recommendations for alternative inspection requirements, and provided a technical basis for these recommended requirements. As modified, the BWRVIP-05 report proposed to reduce the scope of inspection of BWR RPV welds from essentially 100 percent of all RPV shell welds to examination of 100 percent of the axial (i.e., longitudinal) welds and essentially zero percent of the circumferential RPV shell welds, except for the intersections of the axial and circumferential shell welds. In addition, the report included proposals to provide alternatives to the ASME Code, Section XI requirements for successive and additional examinations of circumferential shell welds, provided in paragraphs IWB-2420 and IWB-2430, respectively, of the ASME Code, Section XI.

On July 28, 1998, the NRC staff issued a Safety Evaluation Report (SER) on the BWRVIP-05 report[1]. This SER concluded that the failure frequency of RPV circumferential shell welds in BWRs was sufficiently low to justify elimination of ISI of these welds. In addition, the evaluation concluded that the BWRVIP proposals on successive and additional examinations of circumferential shell welds were acceptable. The evaluation indicated that examination of the circumferential shell welds shall be performed if axial shell weld examinations reveal an active degradation mechanism.

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[1] The NRC staff has identified that in some instances its SER is referenced as dated on July 28, 1998, but in other instances as July 30, 1998. For clarification purposes, the NRC staff notes that this SER is a letter addressed to Carl Terry, BWRVIP Chairman, dated July 28, 1998, and titled "Final SER of the BWR Vessel and Internals Project BWRVIP-05 Report (TAC No. M93925)."

In the BWRVIP-05 report, the BWRVIP committee concluded that the conditional probabilities of failure for BWR RPV circumferential shell welds are orders of magnitude lower than that of the axial shell welds. As a part of its review of the report, the NRC staff conducted an independent probabilistic fracture mechanics assessment of the results presented in the BWRVIP-05 report. The NRC staff assessment conservatively calculated the conditional probability of failure from RPV axial and circumferential shell welds during the original 40-year license period and at conditions approximating an 80-year RPV lifetime for a BWR nuclear plant, as indicated respectively in Tables 2.6-4 and 2.6-5[2] of the NRC staff's July 28, 1998, SER. The failure frequency for an RPV is calculated as the product of the frequency for the critical (limiting) transient event and the conditional probability of failure for the weld.

The NRC staff determined the conditional probability of failure for axial and circumferential shell welds in BWR RPVs fabricated by Chicago Bridge and Iron Nuclear (CBIN), Combustion Engineering, and Babcock and Wilcox. The analysis identified a cold overpressure event that occurred in a foreign reactor as the limiting event for BWR RPVs, with the pressure and temperature from this event used in the probabilistic fracture mechanics calculations. The NRC staff estimated that the probability for the occurrence of the cold overpressure transient was 1.0×10^3 per reactor-year. For each of the RPV fabricators, Table 2.6-4 of the NRC staff's July 28, 1998, SER identifies the conditional failure probabilities for the plant-specific conditions with the highest projected reference temperature (for that fabricator) after the initial 40-year license period.

2.1.2 Generic Letter 98-05

On November 10, 1998, the NRC staff issued Generic Letter (GL) 98-05, "Boiling Water Reactor Licensees' Use of the BWRVIP-05 Report to Request Relief from Augmented Examination Requirements on Reactor Pressure Vessel Circumferential Shell Welds," which states that BWR licensees may request permanent (i.e., for the remaining term of operation under the existing, initial license) relief from the ISI requirements of 10 CFR 50.55a(g) for the volumetric examination of circumferential RPV shell welds (ASME Code, Section XI, Table IWB-2500-1, Examination Category B-A, Item No. B1.11, Circumferential Shell Welds) by demonstrating that:

(1) At the expiration of the license, the circumferential shell welds will continue to satisfy the limiting conditional failure probability for circumferential shell welds in the NRC July 28, 1998, SER, and

(2) Licensees have implemented operator training and established procedures that limit the frequency of cold overpressure events to the amount specified in the NRC's July 28, 1998, SER.

Licensees will still need to perform the required inspections of "essentially 100%" of all axial shell welds.

2.1.3 BWRVIP-74 Report

The NRC staff reviewed technical report BWRVIP-74, "BWR Reactor Pressure Vessel Inspection and Flaw Evaluation Guidelines," dated September 21, 1999, to determine the

[2] Tables 2.6-4 and 2.6-5 are not included in this Safety Evaluation (SE).

applicability of this alternative for an extended period of operation. The NRC staff's evaluation of the BWRVIP-74 report was provided by SER dated October 18, 2001 (ADAMS Accession No. ML012920549), which concluded that Appendix E of the July 28, 1998, SER conservatively evaluated BWR RPVs to 64 effective full-power years (EFPY), which is 10 EFPY greater than what is realistically expected for the end of an additional 20-year license renewal period. Therefore, the NRC staff's analysis provides a technical basis for relief from the current ISI requirements of the ASME Code, Section XI for volumetric examination of the circumferential welds as they may apply for the license renewal period. The October 18, 2001, SER further states that to obtain relief, each licensee will have to demonstrate that:

(1) At the end of the renewal period, the circumferential welds will satisfy the limiting conditional failure probabilities for circumferential welds in Appendix E of the NRC July 28, 1998, SER, and

(2) That they have implemented operator training and established procedures that limit the frequency of cold overpressure events to the amount specified in the NRC staff's July 8, 1998, SER.

The July 28, 1998, SER provides Table 2.6-5, which also includes the conditional failure probabilities identified in Appendix E for each vessel fabricator, along with the corresponding highest projected reference temperature. Therefore, this table provides the limiting case studies for plants requesting relief to the end of the extended period of operation. This relief does not apply to the axial welds; therefore, the licensees still need to perform the required ASME Code inspections of "essentially 100%" of all axial welds.

3.0 TECHNICAL EVALUATION

3.1 The Proposed Alternative

By its March 12, 2010, letter the licensee identified following pressure-retaining RPV shell circumferential welds:

Weld Number	Description	ASME Code Category	ASME Code Item Number
VCBB-1	Circumferential Shell-to-Bottom Head Weld	B-A	B1.11
VCBA-2	Circumferential Shell-to-Shell Weld	B-A	B1.11
VCBB-3	Circumferential Shell-to-Shell Weld	B-A	B1.11
VCBB-4	Circumferential Shell-to-Shell Weld	B-A	B1.11

ASME Code, Section XI, Table IWB-2500-1, Examination Category B-A, Item No. B1.11 requires a volumetric examination of essentially 100 percent of the weld length of the RPV shell circumferential welds each inspection interval. The applicable ASME Code, Section XI, for the MNGP fourth 10-year interval ISI program is the 1995 Edition through the 1996 Addenda.

The licensee stated that the projected failure frequency of the subject welds at MNGP has been determined to be sufficiently low for the duration of the renewed operating license term to justify eliminating the examinations required by 10 CFR 50.55a(g) in accordance with ASME Code, Section XI, Table IWB-2500-1, Examination Category B-A, Item No. B1.11, Circumferential Shell Welds. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), and consistent with guidance provided in NRC Generic Letter 98-05, and the final SER on BWRVIP-74 pertaining to license renewal (letter, C. I. Grimes of NRC to C. Terry of BWRVIP, October 18, 2001; Accession No. ML012920549) the licensee proposed the following alternate provisions, cited verbatim, for the subject weld examinations for the 20-year renewed operating license term.

- The examination requirements of ASME Code Section XI, Table IWB-2500 Examination Category B-A, Item No B1.12 for the RPV longitudinal shell welds, also known as vertical or axial welds, will be performed as required to the extent possible.

- As a proposed alternative to the requirements of ASME Code Item No. B1.11 for the RPV circumferential shell welds, the longitudinal weld examinations for ASME Code Item No. B1.12 will include examination on the segment of RPV circumferential welds VCBA-2, VCBB-3, and VCBB-4 that intersects with the longitudinal welds, or approximately 2 to 3 percent of the RPV shell circumferential weld [length].

- As a proposed alternative to the requirements of ASME Code Item No. B1.11 for RPV circumferential weld VCBB-1, NSPM will perform volumetric examination on approximately 2 to 3 percent of the weld at an accessible location, rather than at the associated longitudinal weld intersections as proposed for the previously mentioned circumferential welds.

- The proposed examination alternative for the RPV circumferential shell welds may be performed from either the internal inside diameter (ID) surface, or from the external outside diameter (OD) surface of the RPV as determined by the MNGP.

- Examination of the remaining portions of the RPV circumferential shell welds will be permanently deferred through the renewed operating license term.

- Examination will be completed in accordance with the ASME Section XI, Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," for the interval's applicable Code of Record edition and addenda as required and modified by 10 CFR 50.55a, "Codes and standards."

The licensee's basis for the above alternate provision can be found in pages 4 thru 10 of its March 12, 2010, submittal.

3.2 NRC Staff Evaluation

ASME Code, Section XI, Table IWB-2500-1, Examination Category B-A, Item No. B1.11 requires a volumetric examination of essentially 100 percent of the weld length of the RPV shell circumferential welds each inspection interval. The licensee requested permanent relief from the requirements of the ASME Code through the end of the license renewal extended period of operation for MNGP.

As noted in Section 2.1 of this safety evaluation, in order to obtain relief, a licensee will have to demonstrate that:

(1) At the end of the renewal period, the circumferential welds will satisfy the limiting conditional failure probabilities for circumferential welds in Appendix E of the NRC staff's July 28, 1998, SER, and
(2) That the licensee has implemented operator training and established procedures that limit the frequency of cold overpressure events to the amount specified in the NRC staff s July 28, 1998, SER.

3.2.1 Evaluation of the Licensee's Neutron Fluence Methodology

The licensee stated that the NRC-approved and Regulatory Guide 1.190-compliant General Electric-Hitachi (GEH) fluence methodology, NEDC-32983P-A, "General Electric Methodology for Reactor Pressure Vessel Fast Neutron Flux Evaluations" (non-proprietary version available at Accession Number ML072480121) was used to perform the fluence calculations for MNGP.

The licensee also stated that the fast neutron flux source used to determine the 120-percent original licensed thermal power level neutron fluence was based on an equilibrium core design representative of uprated operation, and not an extrapolation of the flux based on operation at the originally license thermal power level.

Fluence calculations performed using NEDC-32983P-A use a relatively fine (r, θ, z) spatial mesh and are carried out using an S_{12} angular quadrature. Although cross sections are generally based on ENDF/B-V nuclear data, corrections have been made to include ENDF/B-VI-based cross sections for oxygen, hydrogen, and individual iron isotopes. This addresses the differences between ENDF/B-V and ENDF/B-VI data identified in RG 1.190, is discussed in the safety evaluation report approving NEDC-32983P-A, and is acceptable to the NRC staff. Scattering cross sections are represented using a P_3 Legendre expansion.

RG 1.190 specifies that acceptable fluence calculations should employ, at a minimum, S_8 angular quadrature, cross sections based on the most recent nuclear data, and P_3 Legendre expansion. As discussed above, the method described in NEDC-32983P-A addresses these recommendations acceptably, and thus the MCNP fluence calculations are acceptable with respect to use of approved methodology.

Per the NEDC-32983P-A method, the spatial distribution of neutron source density is assumed to be proportional to the relative cycle-averaged energy production at each fuel node and each bundle location. Monticello has recently requested NRC approval of an extended power uprate. Therefore, the NRC staff requested that the licensee confirm whether the fast neutron flux determination explicitly accounted for the uprated plant operation. The licensee's response indicated that the flux used in the fluence calculations was based on the uprated, equilibrium

core design. This information demonstrates that the licensee fluence calculations account acceptably for past, present, and planned facility operation.

Based on two considerations: (1) fluence calculations were performed using NRC-approved methodology, which has been found to be adherent to RG 1.190, and (2) the fluence calculations account for past, present, and planned facility operation, the NRC staff finds that the fluence calculations are acceptable in so far as they support the licensee's request.

3.2.2 Evaluation of Circumferential Shell Weld Conditional Failure Probability

In NUREG -1865, "Safety Evaluation Report Related to the Licensee Renewal of Monticello Nuclear Generating Plant" dated October 2006 (ADAMS at ML063050414) Section 4.2.6.2, the NRC staff discussed the MNGP beltline materials meeting the embrittlement criteria in BWRVIP-74. As noted in NUREG-1865 the licensee submitted plant-specific information to demonstrate that the MNGP RPV beltline materials meet the criteria specified in BWRVIP-74. To demonstrate that the MNGP RPV has not become embrittled beyond the basis for the relief, the licensee, in its License Renewal Application (LRA) Table 4.2.6.1 (Table 4.2.6.1 is duplicated in the licensee's submittal dated March 12, 2010), compared 54 EFPY material data for the limiting MNGP circumferential weld with that of the 64 EFPY reference case in Appendix E to the staff's SER in the BWRVIP-05 report. The MNGP material data included amounts of copper and nickel, chemistry factor, the neutron fluence, ART_{NDT}, initial RT_{NOT}, and mean RT_{NDT} of the limiting circumferential weld at the end of the renewal period. The NRC staff verified that the data for the copper and nickel contents and the initial RT_{NDT} values for the MNGP circumferential beltline weld material by comparing them with the corresponding data in the Reactor Vessel Integrity Data Base (RVID). The 54 EFPY mean RT_{NDT} value for the MNGP circumferential beltline weld is 47.4°F. The NRC staff checked the licensee's calculations for the 54 EFPY mean RT_{NDT} values for the limiting MNGP circumferential welds using the data presented in LRA Table 4.2.6.1 and found them to be accurate. This 54 EFPY mean RT_{NDT} value for MNGP is bounded by the 64 EFPY mean RT_{NDT} value of 70.6°F used by the NRC to determine conditional failure probability of a circumferential weld in a CB&I-fabricated RPV. The 64 EFPY mean RT_{NDT} value from the NRC staff's SER dated July 28, 1998, is for a CB&I weld because CB&I welded the circumferential welds in the RPV. Because the 54 EFPY mean RT_{NDT} value is less than the 64 EFPY value from the NRC staff's SER dated July 28, 1998, the NRC staff concluded that the NRC analysis bounds the MNGP RPV conditional failure probability.

Therefore, based on its review contained in NUREG-1865, the NRC staff finds the licensee's analysis of the failure probability of a circumferential weld at MNGP to be acceptable for this relief request..

3.2.3 Evaluation of Licensee's Action to Minimize the Possibility of Cold Overpressure Events

Criterion 2 of GL 98-05 requires that the licensee implement sufficient procedures and/or operator training to ensure that the probability of a cold overpressure event is minimized. To satisfy this criterion, the licensee provided its analysis of the potential high-pressure injection sources, administrative controls, and operator training, all of which are currently in place that help to minimize the risk of cold overpressure events.

In its September 27, 2010 submittal the licensee examined a number of conditions that may be precursors to cold overpressurization. Although no cold overpressure events have occurred in this country, the NRC staff has identified cold overpressure events in other countries. Those events resulted from operator errors and lack of, or faulty, procedures. The conditions examined by the licensee are all the circumstances that could be reasonably construed as overpressurization precursors and are as follows.

High Pressure Coolant Injection and Reactor Core Isolation Cooling Systems

The High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) systems are sources of high-pressure injection to the RPV. Both the HPCI and the RCIC systems are steam-turbine driven. During reactor cold shutdown conditions, no steam is available for operation of these systems. Therefore, it is not plausible for these systems to contribute to an over pressurization event while the unit is in cold shutdown.

Feedwater and Condensate Systems

An inadvertent injection by the reactor feedwater pumps with the RPV water level greater than +48 inches is controlled by a high water level interlock. During outages, RPV level is maintained greater than +48 inches, preventing a feedwater pump from starting unless the bypass switch is placed in bypass. Switch position is procedurally controlled to prevent injecting into the RPV. During the RPV pressure test, the bypass switch and the feedwater pumps are isolated and tagged.

For the condensate pumps, precautions are provided in the operating procedures, which indicate to the operators that they need to monitor reactor water level closely when the pumps are supplying feed to the RPV, in order to prevent an overfill event. However, since the shutoff head of the condensate pumps is only approximately 350 pounds per square inch guage (psig), this does not represent a significant challenge to the RPV. Procedural and cautionary steps are provided in operating procedures requiring monitoring of RPV pressure and temperature against the pressure-temperature curves for evolutions where Low Temperature Over Pressurization (LTOP) could be of concern, i.e., startup, shutdown, and pressure/hydrostatic testing. There are also high reactor water level and high reactor pressure alarms in the control room that warn operators when level/pressure limitations are being exceeded.

Control Rod Drive (CRD) and Reactor Water Cleanup Systems (RWCU)

The CRD is another high-pressure water source to the RPV. The nominal flow rate of each CRD pump is 74 gallons per minute (gpm) at a discharge pressure of 1625 psig. Each RWCU pump is capable of delivering 160 gpm of normal cleanup flow. During a RPV pressure test, the flow rate to the RPV varies and is dependent on the rate of flow being discharged through the RWCU System. The operators maintain RPV pressure by balancing CRD and RWCU flow.

Standby Liquid Control System (SLC)

The SLC System is another high-pressure water source to the RPV. There are no automatic starts associated with this system. SLC injection requires an operator to

manually start the system from the control room (via a keylock switch manipulation). Additionally, the injection rate of a SLC pump is approximately 28.5 gpm at a discharge pressure of 1500 psig, which provides ample time for an operator to control reactor pressure in the event of an inadvertent injection.

The licensee's evaluation of potential injection sources that would cause a cold overpressure event is largely consistent with the industry response to the NRC staff's evaluation of the BWRVIP-05 report. Most high pressure injection sources that could cause cold overpressure events are prevented by interlocks, plant conditions, and/or administrative controls. In its final SER for the BWRVIP-05 report, the NRC staff noted that the CRD system could cause conditions that could lead to cold overpressure events. However, as noted above, the injection rate of the CRD system is low, and it will allow the operator sufficient time to react to unanticipated level changes, which reduce the possibility of an event that would result in a violation of the pressure/temperature limits.

The licensee's September 27, 2010, submittal noted that as discussed in the SER for BWRVIP-05, cold pressurization events were reviewed by both the industry, courtesy of the BWRVIP Working Group, and the NRC to identify the critical operator actions that were assumed to occur to mitigate these events. The results and conclusions of the SER were reviewed by the licensee for applicability to MNGP. The licensee made enhancements to the MNGP operating/test procedures and operator training to ensure that they are aware of the potential LTOP for applicable situations, and that operator actions would occur with a high degree of certainty so that the LTOP event frequency is maintained less than that determined acceptable by the NRC as stated in the SER. In its September 27, 2010, letter the licensee evaluated 6 situations where cold overpressurization events could occur: (1) from inadvertent injections, (2) from condensate injection, (3) from CRD injection, (4) from loss of the RWCU system, (5) an actual cold overpressurization event, and (6) operator training. The NRC staff evaluated the submitted information and determined that the probability of cold overpressurization event is minimized by a combination of operator training, procedures, and hardware modification. The measures instituted by the licensee are reasonable and appropriate for the task, i.e., prevent a cold overpressurization event at MNGP.

4.0 CONCLUSION

The NRC staff has reviewed the licensee's ISI Relief Request No. 17, conveyed by letter dated March 12, 2010, as supplemented by letter dated September 27, 2010, and concludes that the licensee has demonstrated conformance with the applicable criteria in NRC GL 98-05 and in the NRC staff's evaluation of the BWRVIP-05 and BWRVIP-74 topical reports. The NRC staff has also concluded that the licensee has acceptably demonstrated that the conditional probability of failure values for the MNGP circumferential welds are sufficiently low to justify elimination of the augmented volumetric examinations that are required by 10 CFR 50.55a(g)(6)(ii)(A)(2) and the volumetric examinations that are required by the ASME Code, Section XI, Table IWB-2500-1, Examination Category B-A, Item No. B1.11.

Based on this analysis, the NRC staff concludes that the licensee's alternative will provide an acceptable level of quality and safety in lieu of performing the required volumetric examinations through the end of MNGP's license renewal extended period of operation. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) through the remainder of MNGP's license renewal extended period of operation.

Additional requirements of the ASME Code, Section XI for which relief has not been specifically requested and approved by the NRC staff remain applicable, including third party reviews by the Authorized Nuclear Inservice Inspector. Furthermore, based on the considerations discussed above, the NRC staff concludes that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation of MNGP in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this alternative will not be inimical to the common defense and security or the health and safety of the public.

Principal Contributors: Thomas K. McLellan, NRR
Benjamin Parks, NRR

Date: February 8, 2011

Mr. Timothy J. O'Connor
Site Vice President
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Northern States Power Company - Minnesota (NSPM)
2807 West County Road 75
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SUBJECT: MONTICELLO NUCLEAR GENERATION PLANT (MNGP) – REQUEST FOR RELIEF NO. 17 REGARDING EXAMINATION OF REACTOR PRESSURE VESSEL SHELL CIRCUMFERENTIAL WELDS (TAC NO. ME3526)

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The Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's submittals and concludes that the licensee's alternative will provide an acceptable level of quality and safety in lieu of performing the required volumetric examinations. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) through the remainder of MNGP's license renewal extended period of operation. The NRC staff also concludes that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation of MNGP in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this alternative will not be inimical to the common defense and security or the health and safety of the public.

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

Sincerely,

/RA/

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