Northern States Power Company

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NSP

September 17, 1998

US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLAN
Docket No. 50-263 License No. DPR-22

Response to Request for Additional Information
Dated June 29, 1998
Regarding Reactor Pressure Vessel Integrity (TAC NO. M1199)

Ref. 1 Letter from Tae Kim, NRC, to Roger O. Anderson, NSP, "Monticello Nuclear Generating Plant - Request for Additional Information Regarding Reactor Pressure Vessel Integrity (TAC NO. MA1199)," June 29, 1998

Ref. 2 Letter from Tae Kim, NRC, to Roger O. Anderson, NSP, "Closeout of Response to Generic Letter 92-01, Revision 1, Supplement 1 for Monticello Nuclear Generating Plant (TAC NO. M92699)," December 9, 1996

Ref. 3 Letter from William J. Hill, NSP, to USNRC Document Control Desk, "Response to Generic Letter 92-01, Revision 1, Supplement 1 Reactor Vessel Structural Integrity, Items 2, 3 and 4," November 13, 1995

By letter dated June 29, 1998 (Reference 1), the NRC staff requested that, in light of information presented in recent Combustion Engineering Owners Group (CEOG), Framatome Technologies Incorporated (FTI), and Boiling Water Reactor Vessel and Internals Project (BWRVIP) reports, NSP re-evaluate the Reactor Pressure Vessel (RPV) weld chemistry values previously submitted as part of Monticello's licensing basis. Attachment A to this letter responds to that request for additional information (RAI).

Based on question two of the RAI, NSP commits to the following:

By December 31, 1998, NSP will submit a Technical Specification License Amendment Request to the NRC to revise the current reactor pressure vessel (RPV) pressure-temperature (P-T) limits.

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Regarding RPV material databases, in Reference. 2, the NRC stated:

> *The staff has also noted that you consider some of the information from the databases to be interim data pending further verification. We request that you provide us with the results of your re-evaluations of any new information you receive relative to your plant.*

The "interim data" referred to by the NRC in Reference 2 originates from NSP's response to Generic Letter 92-01, Revision 1, Supplement 1 Reactor Vessel Structural Integrity (Reference 3). In Reference 3, NSP stated:

> "Monticello has had only one capsule tested to date. A second capsule was irradiation aged in the Prairie Island plant and has been recently shipped to a laboratory for analysis."

With this submittal, the NRC has been provided with a summary of all information available to NSP on the Monticello RPV material and material properties including the latest available results of the capsule irradiated in the Prairie Island plant. As such, the Reference 2 request by the NRC to "provide re-evaluation of any new information" has been fulfilled and this commitment is considered closed.

The next Monticello RPV sample capsule is scheduled to be removed during the 1999/2000 refueling outage. At that time, capsule results will be evaluated and submitted to the NRC as required by Monticello Technical Specifications. Therefore, NSP considers this NRC request to be met.

Please contact Sam Shirey, Sr. Licensing Engineer, at 612-295-1449 if you require additional information related to this request.

M F Hammer

Michael F. Hammer
Plant Manager
Monticello Nuclear Generating Plant

c: Regional Administrator - III, NRC
NRR Project Manager, NRC
Sr. Resident Inspector, NRC
State of Minnesota Attn: Kris Sanda
J Silberg

Affidavit to the US Nuclear Regulatory Commission
Attachment A: NSP Response to NRC Request for Additional Information Regarding Reactor Pressure Vessel Integrity

UNITED STATES NUCLEAR REGULATORY COMMISSION

NORTHERN STATES POWER COMPANY

MONTICELLO NUCLEAR GENERATING PLANT DOCKET NO. 50-263

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION RAGARDING
REACTOR PRESSURE VESSEL INTEGRITY (TAC NO. M1199)

Northern States Power Company, a Minnesota corporation, by letter dated September 17, 1998, provides the requested response to NRC Request for Additional Information regarding Reactor Pressure Vessel Integrity. This letter contains no restricted or other defense information.

NORTHERN STATES POWER COMPANY

By M F Hammer
Michael F. Hammer
Plant Manager
Monticello Nuclear Generating Plant

On this 17th day of September 1998 before me a notary public in and for said County, personally appeared Michael F. Hammer Plant Manager, Monticello Nuclear Generating Plant, and being first duly sworn acknowledged that he is authorized to execute this document on behalf of Northern States Power Company, that he knows the contents thereof, and that to the best of his knowledge, information, and belief the statements made in it are true and that it is not interposed for delay.

Samuel I. Shirey
Samuel I. Shirey
Notary Public - Minnesota
Sherburne County
My Commission Expires January 31, 2000

SAMUEL I. SHIREY
NOTARY PUBLIC - MINNESOTA
My Comm. Exp. Jan. 31, 2000

ATTACHMENT A
NSP Response to NRC Request for Additional Information
Regarding Reactor Pressure Vessel Integrity

In Ref. 1, the NRC made two requests which are repeated and answered below:

Based on this information, in accordance with the provisions of Generic Letter 92-01, Revision 1, Supplement 1, the NRC requests the following:

1. *An evaluation of the bounding assessment in the reference above and its applicability to the determination of the best-estimate chemistry for all of your reactor pressure vessel (RPV) beltline welds. Based upon this reevaluation, supply the information necessary to completely fill out the data requested in Table 1 for each RPV beltline weld material. If the limiting material for your vessel's pressure-temperature (P-T) limits evaluation is not a weld, include the information requested in Table 1 for the limiting material also.*

Two surveillance capsules containing materials representative of the beltline region of the Monticello Reactor - Pressure Vessel (RPV) have been irradiated and tested. The plate materials in the surveillance capsule are from heat C2220. Two plates from this heat (C2220-1 and C2220-2) are located in the lower intermediate shell course of the beltline region of the Monticello RPV. The weld material in the capsule is from a heat of shielded metal arc weld material used to fabricate the RPV, however, the actual heat number is unknown.

One capsule (G-1) was removed from the Monticello RPV in 1981. That capsule had a low lead factor of 0.3 (ratio of the capsule neutron fluence to the highest neutron fluence experienced by the RPV wall). Two sets of specimens were contained in the first capsule. One set of specimens was tested at that time. The second set was reinstalled into a new capsule and later installed in the Prairie Island RPV for continued irradiation. The second capsule saw accelerated fluence (lead factor >10), was removed and tested in 1996. NSP performed calculations per Regulatory Guide 1.99, Rev. 2, Position 2.1 to determine the plant specific chemistry factor. Table 1 of Ref. 1 has been filled out and lists, among other things, the new plant specific chemistry factor. Table 1 is attached.

2. *If the limiting material for your plant changes or if the adjusted reference temperature for the limiting material increases as a result of the above evaluations, provide the revised RT_{NDT} value for the limiting material. In addition, if the adjusted RT_{NDT} value increased, provide a schedule for revising the P-T limits. The schedule should ensure that compliance with 10 CFR Part 50 Appendix G is maintained.*

Results of the surveillance materials tests were evaluated, and adjusted reference temperatures calculated for the predicted end of life fluence at power uprate conditions. Table 1 contains updated information on Monticello's RPV weld and limiting plate material.

Based upon the new plant specific chemistry factor and an evaluation of all of the Monticello RPV materials, the Monticello Technical Specification Pressure-Temperature curves are required to be revised. The required TS license amendment request (LAR) is currently being drafted and will be submitted to the NRC by December 31, 1998. This date is approximately 12 months prior to the next Monticello refueling outage at which time the revised P-T curves would be required for use in the post-refuel startup hydrostatic test. This timeframe will allow 12 months for NRC review of the amendment request and should meet the schedule requirements of 10 CFR 50 Appendix G. "Fracture Toughness Requirements."

TABLE 1

Facility: Monticello
Vessel Manufacturer: Chicago Bridge and Iron (CB&I)

Information requested on RPV Weld and/or Limiting Materials

RPV Weld Wire Heat[1]	Best Estimate Copper	Best Estimate Nickel	EOL ID Fluence ($x\ 10^{18}$)[a]	Assigned Material Chemistry Factor (CF)	Method of Determining CF[2]	Initial RT_{NDT} ($RT_{NDT(U)}$)	σ_i	σ_Δ	Margin	ART or RT_{NDT} at EOL
8018N	0.10%	0.99%	5.11	138.5	Two sets surveillance capsules	-65.6°F	12.7°F	28°F	61.5°F	97.0°F
C2220[b]	0.17%	0.65%	5.11	130.8	Two sets surveillance capsules	27°F	0.0°F	17°F	34°F	156.5°F

(1) or the material identification of the limiting material as requested in Section 1.0 (1.)
(2) determined from tables or from surveillance data

Wire Weld Heat	Discussion
8018N (Type)	All heats and chemistries for all weld wire used in the RPV are known. However, the specific heats used in the beltline are unknown, therefore the numbers for best estimate Cu & Ni are the most conservative values (from a neutron embrittlement standpoint) of Cu & Ni.

[a] End of Life (EOL) fluence is predicted for uprate conditions.
[b] C2220 is the most limiting plate.