



Northern States Power Company

Monticello Nuclear Generating Plant  
2807 West County Road 75  
Monticello, MN 55362

January 21, 2000

10 CFR Part 50  
Section 50.90

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

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

**Response to Request for Additional Information  
Regarding License Amendment Request for Monticello Cycle 20  
Safety Limit Minimum Critical Power Ratio (TAC No. MA7355)**

- Ref. 1 Letter from Byron D. Day, NSP, to US Nuclear Regulatory Commission, "License Amendment Request for Monticello Cycle 20 Safety Limit Minimum Critical Power Ratio," December 16, 1999.
- Ref. 2 Letter from NRC to Michael F. Hammer, NSP, "Monticello Nuclear Generating Plant - Request for Additional Information Related to License Amendment Request (TAC No. MA7355)," January 18, 2000.

On December 16, 1999, NSP submitted a request for a change in the Technical Specifications, Appendix A of the Operating License for the Monticello Nuclear Generating Plant (Reference 1). On January 18, 2000, the NRC requested additional information (Reference 2), regarding NSP's earlier submittal. The attached response is submitted in accordance with the provisions of 10 CFR Part 50, Section 50.90.

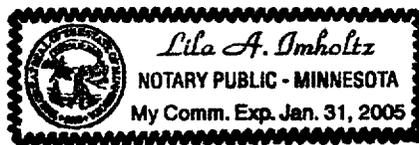
Implementation of the new Safety Limit Minimum Critical Power Ratio (SLMCPR) values should be effective upon startup from the current refueling outage.

This submittal does not contain any new NRC commitments and does not modify any prior commitments. Please contact Sam Shirey, Sr. Licensing Engineer, at (612) 263-7429 if you require further additional information related to this request.

by Byron D. Day  
Byron D. Day  
Plant Manager  
Monticello Nuclear Generating Plant

On this 21<sup>st</sup> day of January 2000 before me a notary public in and for said County, personally appeared Byron D. Day, 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.

Lila A. Imholte  
Lila A. Imholte  
Notary Public - Minnesota  
Sherburne County  
My Commission Expires January 31, 2005



C: Regional Administrator-III, NRC  
NRR Project Manager, NRC  
Resident Inspector, NRC  
State of Minnesota  
Attn: Steve Minn

Attachments:

- Exhibit A – Response to Request for Additional Information.
- Exhibit B - NEDO-24271, 80NED277, "Monticello Nuclear Generating Plant Single-Loop Operation," June 1980.

**Response to Request for Additional Information  
Regarding License Amendment Request for Monticello Cycle 20  
Safety Limit Minimum Critical Power Ratio (TAC No. MA7355)**

**BACKGROUND**

On December 16, 1999, NSP submitted to the NRC a request for a change in the Technical Specifications, Appendix A of the Operating License for the Monticello Nuclear Generating Plant (Ref. 1). On January 13, the NRC staff verbally requested answers to four questions. This call was followed up with a written request for information on January 18, 2000 (Ref. 2). The attached document responds to the NRC's request for additional information (RAI).

**NRC QUESTIONS AND NSP RESPONSES:**

1. *Describe the recently added GE requirement for the single-loop operation analysis referred to in Exhibit A, Change 3, on page A-2 and cited in Exhibit F.*

Response: The Single Loop Operation (SLO) Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) approach:

Determine a MAPLHGR multiplier for SLO such that the nominal SLO PCT is less than the nominal two-loop PCT used as the basis for the Upper Bound Peak Clad Temperature (PCT) calculations. The basis for this approach is to ensure that the results for SLO conditions are less limiting than the results for two-loop operation. This way, the two-loop Upper Bound PCT is bounding for all operating conditions and meets the requirement that the Upper Bound PCT remain below 1,600°F. The Appendix K case is then run using the MAPLHGR multiplier determined from the nominal analysis to confirm that the Licensing Basis PCT will remain below 2,200°F.

The above described analysis approach is better characterized as a strict and conservative interpretation of the SAFER/GESTR SER rather than a recently added requirement.

2. *Please provide copies of the three references cited in Exhibit F. Were these reviewed and approved by the NRC?*

Response: See following table:

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Ref. No.	Document No.	Status
1.	NEDC-32514P, Rev. 1	This NEDC document was transmitted to the NRC as Exhibit G of NSP's December 4, 1997 uprate submittal. The uprate program was approved by the NRC on September 16, 1998 (Ref. 3). This is a General Electric (GE) proprietary document. In accordance with 10CFR2.790(a)(4), this document was transmitted to the NRC with the required affidavit requesting it be withheld from public disclosure. NSP therefore requests the NRC refer to this previously transmitted copy.
2.	NEDO-24271, 80NED277	This NEDO document was transmitted to the NRC on March 24, 1986 (Ref. 4) as part of a license amendment request approved by the NRC on October 22, 1986 (Ref. 5). For ease of NRC review, a copy is attached to this submittal as "Exhibit B."
3.	TDP-0106	This is an internal General Electric working level procedure not intended for external distribution. It has therefore, not been transmitted by NSP for NRC approval. Note that the procedure is based on GE Licensing Technical Report NEDE-32785PA, which was approved by the NRC in a letter sent to GE on June 1, 1984.

3. *Please provide the number of fuel bundles for each fuel type to be used in the Cycle 20 core.*

Response: GE10-P8DXB333-10GZ-100M-145-T = 44  
 GE10-P8DXB324-11GZ-100M-145-T = 24  
 GE11-P9DUB347-10GZ-100T-141-T = 44  
 GE11-P9DUB348-10GZ-100T-141-T = 96  
 GE12-P10DSB330-12GZ-100T-145-T = 4  
 GE11-P9DUB366-16GZ-100T-141-T = 68  
 GE11-P9DUB366-17GZ-100T-141-T = 60  
 GE11-P9DUB380-17GZ-100T-141-T = 40  
 GE11-P9DUB380-16GZ-100T-141-T = 104  
 Total = 484

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4. *Describe the Cycle 19 and Cycle 20 core loading design and fuel bundle design, and identify the differences and their impact on the safety limit minimum critical power ratio values in the analyses.*

Response:

**BACKGROUND:**

The primary impact on the SLMCPR calculation is how evenly distributed power is within a bundle or core design. A "flatter" power distribution tends to have a larger SLMCPR than a bundle or core design resulting in greater power peaking. NSP normally strives for flat power distributions in bundle and core designs for economic reasons. Therefore, the SLMCPRs calculated for Monticello tend to be high compared to other similar BWRs.

**BUNDLE DESIGN:**

The fresh fuel for Cycle 19 had a somewhat higher "R" factor at the limiting SLMCPR exposure than the new Cycle 20 fuel. This means that the Cycle 20 fresh fuel has a flatter power distribution at the exposure where SLMCPR is calculated. This tends to increase the calculated SLMCPR.

**CORE DESIGN:**

The Cycle 19 core design was detuned from an optimized design in order to increase the amount of shutdown margin. This was done to compensate for a less than expected end-of-cycle (EOC) exposure of the previous cycle (Cycle 18). Therefore, the Cycle 19 core had somewhat more local power peaking than an optimum economic core. With higher power peaking, the calculated SLMCPR for the actual Cycle 19 core was 0.01 less than for the optimum Cycle 19 core. The Cycle 20 core is similar to the optimized design for Cycle 19. Therefore, the Cycle 20 SLMCPR was expected to increase by about 0.01 from the actual Cycle 19 SLMCPR. Calculations by the fuel supplier bore this out.

REFERENCES:

1. Letter from Byron D. Day, NSP, to US Nuclear Regulatory Commission, "License Amendment Request for Monticello Cycle 20 Safety Limit Minimum Critical Power Ratio," December 16, 1999.

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2. Letter from NRC to Michael F. Hammer, NSP, "Monticello Nuclear Generating Plant - Request for Additional Information Related to License Amendment Request (TAC No. MA7355)," January 18, 2000.
3. Letter from NRC to R.O. Anderson, NSP, "Monticello Nuclear Generating Plant – Issuance of Amendment Re: Power Uprate Program (TAC No. M96238)," September 16, 1998.
4. Letter from NSP to NRC - Director Office of Nuclear Reactor Regulation, "License Amendment Request Dated September 7, 1976, Revision No. 2, Single Recirculation Loop Operation," March 24, 1986.
5. Letter from NRC to D. M. Musolf, NSP, "Single Recirculation Loop Operation (TAC 61493)," October 22, 1986.