

April 20, 1998

Mr. Roger O. Anderson, Director
Nuclear Energy Engineering
Northern States Power Company
414 Nicollet Mall
Minneapolis, MN 55401

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT - ISSUANCE OF
AMENDMENT RE: MINIMUM CRITICAL POWER RATIO SAFETY LIMITS
FOR OPERATING CYCLE 19 (TAC NO. MA1219)

Dear Mr. Anderson:

The Commission has issued the enclosed Amendment No. 100 to Facility Operating License No. DPR-22 for the Monticello Nuclear Generating Plant. The amendment consists of changes to the Technical Specifications in response to your application dated March 13, 1998, as supplemented March 25, 1998.

The amendment revises the Minimum Critical Power Ratio safety limits for Operating Cycle 19 based on the cycle-specific analysis of the current mixed core of GE [General Electric] 11, GE10, four GE12 lead use assemblies, and eight Siemens Power Company ATRIUM-9B fuel parameters. A copy of our related Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

ORIGINAL SIGNED BY

Tae Kim, Senior Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket No. 50-263

Enclosures: 1. Amendment No. 100 to DPR-22
2. Safety Evaluation

cc w/encl: See next page

DISTRIBUTION: See attached page

DOCUMENT NAME: G:\WPDOCS\MONTICEL\MOMA1219.AMD

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Mr. Roger O. Anderson, Director
Northern States Power Company

Monticello Nuclear Generating Plant

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DATED: April 20, 1998

AMENDMENT NO. 100 TO FACILITY OPERATING LICENSE NO. DPR-22 - MONTICELLO

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

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-263

MONTICELLO NUCLEAR GENERATING PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 100
License No. DPR-22

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Northern States Power Company (the licensee) dated March 13, 1998, as supplemented March 25, 1998, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.2 of Facility Operating License No. DPR-22 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 100, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Tae Kim, Senior Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: April 20, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 100

FACILITY OPERATING LICENSE NO. DPR-22

DOCKET NO. 50-263

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

REMOVE

6
249b

INSERT

6
249b

2.0 SAFETY LIMITS

2.1 FUEL CLADDING INTEGRITY

Applicability:

Applies to the interrelated variables associated with fuel thermal behavior.

Objective:

To establish limits below which the integrity of the fuel cladding is preserved.

Specification:

- A. Core Thermal Power Limit (Reactor Pressure >800 psia and Core Flow is >10% of Rated)

When the reactor pressure is >800 psia and core flow is >10% of rated, the existence of a minimum critical power ratio (MCPR) less than 1.10*, for two recirculation loop operation, or less than 1.11* for single loop operation, shall constitute violation of the fuel cladding integrity safety limit.

* MCPR values for cycle 19 only.

2.1/2.3

LIMITING SAFETY SYSTEM SETTINGS

2.3 FUEL CLADDING INTEGRITY

Applicability:

Applies to trip settings of the instruments and devices which are provided to prevent the reactor system safety limits from being exceeded.

Objective:

To define the level of the process variables at which automatic protective action is initiated to prevent the safety limits from being exceeded.

Specification:

The Limiting safety system settings shall be as specified below:

A. Neutron Flux Scram

1. APRM - The APRM flux scram trip setting shall be:
 - a. For two recirculation loop operation (TLO):
$$S \leq 0.66W + 70\%$$
where
$$S = \text{Setting in percent of rated thermal power, rated power being 1670 MWt}$$
$$W = \text{Percent of the drive flow required to produce a rated core flow of } 57.6 \times 10^6 \text{ lb/hr}$$
 - b. For single recirculation loop operation (SLO):
$$S \leq 0.58(W - 5.4) + 62\%$$
 - c. No greater than 120%.

7. Core Operating Limits Report

- a. Core operating limits shall be established and documented in the Core Operating Limits Report before each reload cycle or any remaining part of a reload cycle for the following:
- Rod Block Monitor Operability Requirements (Specification 3.2.C.2a)
 - Rod Block Monitor Upscale Trip Settings (Table 3.2.3, Item 4.a)
 - Recirculation System Power to Flow Map Stability Regions (Specification 3.5.F)
 - Maximum Average Planar Linear Heat Generation Rate Limits (Specification 3.11.A)
 - Linear Heat Generation Rate Limits (Specification 3.11.B)
 - Minimum Critical Power Ratio Limits (Specification 3.11.C)
 - Power to Flow Map (Bases 2.3.A)
- b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:
- NEDE-24011-P-A, "General Electric Standard Application for Reactor Fuel" (the approved version at the time the reload analyses are performed)*
 - NSPNAD-8608-A, "Reload Safety Evaluation Methods for Application to the Monticello Nuclear Generating Plant" (the approved version at the time the reload analyses are performed)
 - NSPNAD-8609-A, "Qualification of Reactor Physics Methods for Application to Monticello" (the approved version at the time the reload analyses are performed)
 - ANF-91-048(P)(A), "Advanced Nuclear Fuels Corporation Methodology for Boiling Water Reactors-EXEM BWR Evaluation Model," Siemens Power Corporation (the approved version at the time the reload analyses are performed)
 - NEDO-31960, "BWR Owners' Group Long-Term Stability Solutions Licensing Methodology," June 1991 (the approved version at the time the reload analyses are performed)
 - NEDO-31960, Supplement 1, "BWR Owners' Group Long-Term Stability Solutions Licensing Methodology," March 1992 (the approved version at the time the reload analyses are performed)
- c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal-mechanical limits, core thermal-hydraulic limits, ECCS limits, nuclear limits such as shutdown margin, transient analysis limits and accident analysis limits) of the safety analysis are met.
- d. The Core Operating Limits Report, including any mid-cycle revisions or supplements, shall be supplied upon issuance, for each reload cycle, to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector.

* For cycle 19 only as approved in SE dated April 20, 1998.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 100 TO FACILITY OPERATING LICENSE NO. DPR-22

NORTHERN STATES POWER COMPANY
MONTICELLO NUCLEAR GENERATING PLANT

DOCKET NO. 50-263

1.0 INTRODUCTION

By letter dated March 13, 1998, as supplemented March 25, 1998, the Northern States Power Company (the licensee) requested an amendment to the Technical Specifications (TS) appended to Facility Operating License No. DPR-22 for the Monticello Nuclear Generating Plant (MNGP). The proposed amendment would revise the Minimum Critical Power Ratio (MCPR) safety limits based on the cycle-specific analysis of the current mixed core of GE [General Electric] 11, GE10, four GE12 lead use assemblies, and eight Siemens Power Company (SPC) ATRIUM-9B fuel parameters. The proposed amendment would also change the footnotes on TS pages 6 and 249b which will make the safety limit MCPR values applicable to cycle 19 only. In addition, the proposed amendment makes administrative corrections of previously introduced errors on TS pages 6 and 249b. The March 25, 1998, letter provided clarifying information in response to the staff's request for additional information. This information was within the scope of the original application and did not change the staff's initial proposed no significant hazards considerations determination. Therefore, renoticing was not warranted.

2.0 EVALUATION

In accordance with 10 CFR 50.90, the licensee requested a change to the MNGP TS to revise the MCPR safety limits based on the cycle-specific analysis, and also to make administrative corrections of previously introduced errors in the TS. The MCPR safety limits are the lowest MCPR values that will ensure that at least 99.9 percent of the fuel rods in the core would not be expected to experience boiling transition during either normal operation or anticipated operational occurrences as specified in the Standard Review Plan (NUREG-0800), Section 4.4, "Thermal and Hydraulic Design." The proposed revision of TS 2.1.A, 2.3, and TS 6.7 is described below.

2.1 Revision to TS 2.1.A

The licensee has proposed to change the Safety Limit MCPR (SLMCPR) in TS 2.1.A from 1.08 to 1.10 for two recirculation loop operation, and from 1.09 to 1.11 for single recirculation loop operation, when the reactor steam dome pressure is greater than 800 psia [pounds per square inch absolute], and core flow is greater than 10 percent rated core flow. This proposed TS change also involves changing the footnote on page 6 from cycle "18" to cycle "19."

Although cycles 18 and 19 use the same fuel types, the cycle-specific SLMCPR for cycle 19 is higher primarily because: (1) cycle 19 has a slightly flatter core MCPR distribution and much flatter in-bundle power distribution than cycle 18; and (2) cycle 19 is loaded with a higher reload average batch weight percent enrichment than cycle 18.

The proposed changes to SLMCPR values in TS 2.1.A for cycle 19 are based on the analyses performed using MNGP cycle 19 cycle-specific inputs and approved methodologies including GESTAR II (NEDE-24011-P-A-13, Sections 1.1.5 and 1.2.5 [proprietary information-not publicly available]) and a revised R-factor methodology described in NEDC-32505P, "R-Factor Calculation Method for GE11, GE12 and GE13 Fuel," [proprietary information-not publicly available] November 1995. The revised R-factor calculation method uses the same NRC-approved equation stated in GESTAR II (NEDE-24011-P-A) with the correction factors that substitute rod-integrated powers for the lattice peaking factors to account for the effects of the part-length-rod design.

The staff has reviewed the R-factor calculation method for GE11 fuel, the relevant information provided in the proposed Amendment 25 to GESTAR II, NEDE-24011 (which is under staff review), and the supplemental information dated March 25, 1998, in response to the staff request for additional information during a teleconference on March 24, 1998, on the MNGP cycle 19 SLMCPR calculation with respect to modeling of the eight SPC ATRIUM-9B assemblies and their impact on the SLMCPR calculation. The ATRIUM-9B assemblies are loaded in the core locations such that they have significant CPR margin relative to the limiting MCPR assemblies in the core. In addition, an administrative adder of 0.02 will be incorporated in the operating limit MCPR in the MNGP cycle 19 3D-Monicore core monitoring databank for the ATRIUM-9B assemblies.

Based on its review of the above information, the staff has concluded that the proposed change of the SLMCPR in TS 2.1.A from 1.08 to 1.10 for two recirculation loop operation, and from 1.09 to 1.11 for single recirculation loop operation for MNGP cycle 19 is acceptable since the revised SLMCPR will ensure that at least 99.9 percent of the fuel rods in the core would not be expected to experience boiling transition during either normal operation or anticipated operational occurrences as specified in the Standard Review Plan (NUREG-0800), Section 4.4.

The proposed change to the footnote on TS page 6 from cycle "18" to cycle "19" is acceptable since it clarifies the fact that the revised SLMCPR values are for cycle 19 only.

2.2 Revision to TS 2.3.A

The proposed administrative change on TS page 6 from "MWT" to "MWt" is acceptable since the change does not alter the intent of the TS while ensuring consistency with the remainder of the TS.

2.3 Revision to TS 6.7

The proposed administrative change to TS 6.7.a. on page 249b from "Linear Heat Generation Ratio Limits" to "Linear Heat Generation Rate Limits" is acceptable since the change does not alter the intent of the TS while correcting a previously introduced error.

Also, the proposed change to the footnote on TS page 249b from "** For cycle 18 only as approved in SE dated October 1997" to "** For cycle 19 only as approved in SE dated April 20,

1998" is acceptable since it clarifies the fact that the revised SLMCPR values are for cycle 19 only and it reflects the approved use of the revised R-factor calculation method and will ensure that values for cycle-specific parameters are determined such that applicable limits (i.e., nuclear limits, transient analysis limits, and accident analysis limits) are met.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Minnesota State official was notified of the proposed issuance of the amendment. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (63 FR 13704). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: T. Huang

Date: April 20, 1998