

SEP 28 1977

Docket No. 50-263

DISTRIBUTION:

Docket ACRS (16)  
 NRC PDR OPA (CMiles)  
 L PDR TABernathy  
 ORB#2 Rdg. JBuchanan  
 VStello TCarter  
 KGoller  
 RDiggs  
 DSnaider  
 OELD  
 OI&E (5)  
 BJones (4)  
 BScharf (15)  
 JSaltzman  
 CHEbron  
 BHarless  
 DEisenhut  
 BBaer

Northern States Power Company  
 ATTN: Mr. L. O. Mayer, Manager  
 Nuclear Support Services  
 414 Nicollet Mall - 8th Floor  
 Minneapolis, Minnesota 55401

Gentlemen:

By Licensee Event Report dated June 27, 1977, you reported that during an investigation of Fuel Cycle 5 Minimum Critical Power Ratio (MCPR) limits for the Monticello Nuclear Generating Plant, General Electric Company found that the recirculation pump trip delay time assumed in the transient analysis was not correct. Correction of this pump trip time resulted in an increase in Operating Limit MCPR by .08 for both 7x7 and 8x8 fuels, both of which are currently in use at Monticello. You correctly administratively increased the MCPR limits by .08. These limits will also be applicable for the next fuel cycle.

By letter dated July 29, 1977, you then submitted a proposed change to the Monticello Technical Specifications to formally incorporate the increased MCPR requirements. Additionally, you requested an editorial change to an error which had appeared in an earlier Technical Specification change issuance.

We have reviewed your submittal and have determined that the proposed changes are acceptable. Therefore, enclosed is Amendment No. 30 to Provisional Operating License DPR-22 for the Monticello Nuclear Generating Plant. Our related Safety Evaluation and Notice of Issuance are also enclosed.

Sincerely,  
 Original signed by

*Don K. Davis*

Don K. Davis, Acting Chief  
 Operating Reactors Branch #2  
 Division Of Operating Reactors

Enclosed:

1. Amendment No. 30 to License DPR-22
2. Safety Evaluation
3. Notice

OT/RS:DOR

BBaer

9/28/77

*Feb*  
*check ORB#2*  
*9/28/77*  
*no*

OFFICE >	cc w/enclosure:	See next page	ORB#1:DOR RSnaider:nm 9/16/77	ORB#2:DOR RDiggs 9/15/77	OELD S H Lewis 9/2/77	ORB#2:DOR DDavis 9/7/77
----------	-----------------	---------------	-------------------------------------	--------------------------------	-----------------------------	-------------------------------

Northern States Power Company

- 2 -

September 28, 1977

cc w/enclosures:

Gerald Charnoff, Esquire  
Shaw Pittman, Potts & Trowbridge  
1800 M Street, N. W.  
Washington, D. C. 20036

Arthur Renquist, Esquire  
Vice President - Law  
Northern States Power Company  
414 Nicollet Mall  
Minneapolis, Minnesota 55401

Howard J. Vogel, Esquire  
Legal Counsel  
2750 Dean Parkway  
Minneapolis, Minnesota 55416

Mr. Kenneth Dzugan  
Environmental Planning Consultant  
Office of City Planner  
Grace Building  
421 Wabasha Street  
St. Paul, Minnesota 55113

Sandra S. Gardebring  
Executive Director  
Minnesota Pollution Control Agency  
1935 W. County Road B2  
Roseville, Minnesota 55113

Anthony Z. Roisman, Esquire  
Roisman, Kessler and Cashdan  
1025 15th Street, N. W. 5th Floor  
Washington, D. C. 20005

The Environmental Conservation Library  
Minneapolis Public Library  
300 Nicollet Mall  
Minneapolis, Minnesota 55401

Mr. Steve Gadler  
2120 Carter Avenue  
St. Paul, Minnesota 55108

Chief, Energy Systems Analyses  
Branch (AW-459)  
Office of Radiation Program  
U. S. Environmental Protection Agency  
Rm. 645, East Tower  
401 M Street, S. W.  
Washington, D. C. 20460

U. S. Environmental Protection Agency  
Federal Activities Branch  
Region V Office  
ATTN: EIS COORDINATOR  
230 South Dearborn Street  
Chicago, Illinois 60604

Mr. D. S. Douglas, Auditor  
Wright County Board of Commissioners  
Buffalo, Minnesota 55313

cc w/enclosures and cy of NSPCo  
filing dtd. 7/29/77

State Department of Health  
ATTN: Secretary & Executive Officer  
University Campus  
Minneapolis, Minnesota 55440



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

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-263

MONTICELLO NUCLEAR GENERATING PLANT

AMENDMENT TO PROVISIONAL OPERATING LICENSE

Amendment No. 30  
License No. DPR-22

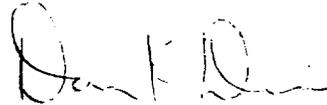
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Northern States Power Company (the licensee) dated July 29, 1977 complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules 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 a change to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 3.B of Provisional License No. DPR-22 is hereby amended to read as follows:

3.B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 30, 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 its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Don K. Davis, Acting Chief  
Operating Reactors Branch #2  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: September 28, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 30  
PROVISIONAL OPERATING LICENSE NO. DPR-22  
DOCKET NO. 50-263

Replace the following pages of the Technical Specifications contained in Appendix A of the above-indicated license with the attached replacement pages. The changed areas on the revised pages are reflected by a marginal line.

78  
189D  
189F

### 3.0 LIMITING CONDITIONS FOR OPERATION

- (b) Whenever the reactor is in the startup or run mode below 10% rated thermal power, no control rods shall be moved unless the rod worth minimizer is operable or a second independent operator or engineer verifies that the operator at the reactor console is following the control rod program. The second operator may be used as a substitute for an inoperable rod worth minimizer during a startup only if the rod worth minimizer fails after withdrawal of at least twelve control rods.
4. Control rods shall not be withdrawn for startup or refueling unless at least two source range channels have an observed count rate equal to or greater than three counts per second.
5. Whenever the Engineer, Nuclear, determines that a limiting control rod pattern exists, withdrawal of designated control rods shall be permitted only when the RBM system is operable.

### 4.0 SURVEILLANCE REQUIREMENTS

- (iv) The rod block function of the rod worth minimizer shall be verified by attempting to withdraw an out-of-sequence control rod beyond the block point.
- (b) If the rod worth minimizer is inoperable while the reactor is in the startup or run mode below 10% rated thermal power and the second independent operator or engineer is being used, he shall verify that all rod positions are correct prior to commencing withdrawal or insertion of each rod group.
4. Prior to control rod withdrawal for startup or during refueling verify that at least two source range channels have an observed count rate of at least three counts per second.
5. Whenever the Engineer, Nuclear, determines that a limiting control rod pattern exists, an instrument functional test of the RBM shall be performed prior to withdrawal of the designated rod(s) and daily thereafter.

### 3.0 LIMITING CONDITIONS FOR OPERATION

#### C. Minimum Critical Power Ratio (MCPR)

During power operation, the Operating MCPR Limit shall be  $\geq 1.46$  for 8x8 fuel and  $\geq 1.37$  for 7x7 fuel at rated power and flow. If at any time during operation it is determined that the limiting value for MCPR is being exceeded, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits. If the steady state MCPR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours. For core flows other than rated the Operating MCPR Limit shall be the above applicable MCPR value times  $K_f$  where  $K_f$  is as shown in Figure 3.11.3.

3.11/4.11

### 4.0 SURVEILLANCE REQUIREMENTS

#### C. Minimum Critical Power Ratio (MCPR)

MCPR shall be determined daily during reactor power operation at  $\geq 25\%$  rated thermal power and following any change in power level or distribution which has the potential of bringing the core to its operating MCPR limit.

189D

## Bases 3.11 (continued)

### C. Minimum Critical Power Ratio (MCPR)

The ECCS evaluation presented in Reference 4 assumed the steady state MCPR prior to the postulated loss-of-coolant accident to be 1.18 for all fuel types. In addition, the ECCS analysis presented in Reference 6 assumed an initial MCPR of 1.24 for reduced flow conditions. The Operating MCPR Limit of 1.46 for 8x8 fuel and 1.37 for 7x7 fuel is determined from the analysis of transients discussed in Bases Sections 2.1 and 2.3. By maintaining an operating MCPR above these limits, the Safety Limit of 1.06 (T.S.2.1.A) applicable to all fuel types is maintained in the event of the most limiting abnormal operational transient.

For operation with less than rated core flow the Operating MCPR Limit is adjusted by multiplying the above limit by  $K_f$ . Reference 5 discusses how the transient analysis done at rated conditions encompasses the reduced flow situation when the proper  $K_f$  factor is applied.

Those abnormal operational transients, analyzed in FSAR Section 14.5, which result in an automatic reactor scram are not considered a violation of the LCO. Exceeding MCPR limits in such cases need not be reported.

### References

1. "Fuel Densification Effects in General Electric Boiling Water Reactor Fuel," Supplements 6, 7, and 8, NEDM-10735, August, 1973.
2. Supplement 1 to Technical Report on Densification of General Electric Reactor Fuels, December 14, 1974 (USAEC Regulatory Staff)
3. Communication: VAMoore to IS Mitchell, "Modified GE Model for Fuel Densification," Docket 50-321, March 27, 1974.
4. "Monticello Nuclear Generating Plant Loss-Of-Coolant Accident Analysis Conformance with 10 CFR 50 Appendix K, August 1974," L O Mayer (NSP) to J F O'Leary, August 20, 1974.
5. "General Electric BWR Generic Reload Application for 8 x 8 Fuel," NEDO-20360, Revision 1, November 1974.
6. "Additional Effects of Core Flow on ECCS LOCA Analysis," A. Levine (GE) to Z. Rosztoczy (NRC), August 24, 1976.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 30 TO PROVISIONAL OPERATING LICENSE NO. DPR-22

NORTHERN STATES POWER COMPANY

MONTICELLO NUCLEAR GENERATING PLANT

DOCKET NO. 50-263

INTRODUCTION

By Licensee Event Report dated June 27, 1977, Northern States Power Company (NSP) informed the NRC of the results of a General Electric Company (GE) verification of Fuel Cycle 5 (present cycle) Minimum Critical Power Ratio (MCPR) limits for the Monticello Nuclear Generating Plant. GE's analysis showed that the assumed time for the recirculation pump trip was incorrect in the event of a turbine trip or generator trip. The correction yielded increased values of the Operating Limit MCPR for both 7x7 and 8x8 fuel, both of which are utilized in the present Monticello core. NSP correctly established revised administrative controls to assure usage of the new MCPR limits and then, by license amendment request dated July 29, 1977, requested incorporation of the revised limits into the Monticello Technical Specifications. The July 29, 1977 letter also requested correction of an editorial error made during retyping and issuance of an earlier license amendment.

DISCUSSION & EVALUATION

Monticello's electrical protection system includes trip circuitry for the recirculation pump motors to prevent large non-essential loads from being transferred to the auxiliary transformer in the event of a turbine trip or generator trip. However, trip circuitry does not meet the same standards as the reactor protection system. When modeling was performed using the original GE fuel damage figure-of-merit (Minimum Critical Heat Flux Ratio or MCHFR), it was found that the pump trip did not influence the results of analyzed transients. The trip was used in modeling the transients only to represent the plant as it existed.

This same modeling was performed when the new GE figure-of-merit, MCPR, was incorporated by the GE Thermal Analysis Bases (GETAB). However, in a recent model verification by GE to determine conditions at the end of Cycle 6 (the next cycle), it was discovered that the pump trip had been modeled to occur too rapidly in the GETAB analysis, resulting

in a delta CPR for the pump trip case 0.08 smaller than the case without the pump trip, and thus unintentionally taking credit for the pump trip. Corrections were incorporated to adjust the recirculation pump trip time in the model, necessitating an increase of 0.08 in the Operating Limit MCPR for both 7x7 and 8x8 fuel, and once again removing the effect of the pump trip from the determination of thermal limits. The pump trip will continue to be incorporated into the model with the revised trip time in order to best describe the plant in its existing condition.

The calculated increase in Operating Limit MCPR of 0.08 is not only bounding for the present cycle with 8x8 and 7x7 fuels, but is also applicable to the 8x8 fuel during the next fuel cycle (7x7 fuel will be replaced by 8x8 fuel during the Fall 1977 refueling outage). Analysis showed that at the end of the next fuel cycle (cycle 6), the requested Operating Limit MCPR of 1.46 will insure the Safety Limit MCPR of 1.06 is not violated during the limiting transients, which are turbine trip without bypass and generator trip without bypass.

Because the proposed change results from correction of a previous model error, and because the model has again been revised to give no credit to a non-safety-grade system, we find the proposed changes to be acceptable.

The proposed editorial change involves revising the incorrect insertion of the acronym RWM (Rod Worth Minimizer) for the acronym RBM (Rod Block Monitor) in an earlier license amendment. Our examination of the specifications involved showed that the two acronyms had indeed been inadvertently switched. We have determined that correction of such an editorial error is necessary and is acceptable. It was noted that, since the specification was issued, no occasion has arisen involving a "limiting control rod pattern" which would require functional testing of the RBM, and thus the error has resulted in no degradation of plant safety.

#### ENVIRONMENTAL CONSIDERATION

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR §51.5(d)(4) that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: September 28, 1977

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-263

NORTHERN STATES POWER COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO PROVISIONAL  
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 30 to Provisional Operating License No. DPR-22, issued to Northern States Power Company (the licensee), which revised Technical Specifications for operation of the Monticello Nuclear Generating Plant (the facility) located in Wright County, Minnesota. The amendment is effective as of its date of issuance.

The amendment modified the existing Monticello Technical Specifications to revise the Operating Limit Minimum Critical Power Ratio limits in response to a correction of the model used and to correct an editorial mistake in a previously issued license amendment.

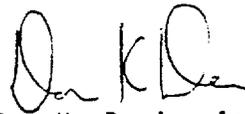
The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has determined that the issuance of this amendment will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of this amendment.

For further details with respect to this action, see (1) the application for amendment dated July 29, 1977, (2) Amendment No. 30 to License No. DPR-22, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at The Environmental Conservation Library, Minneapolis Public Library, 300 Nicollet Mall, Minneapolis, Minnesota 55401. A single copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 28th day of September, 1977.

FOR THE NUCLEAR REGULATORY COMMISSION



Don K. Davis, Acting Chief  
Operating Reactors Branch #2  
Division of Operating Reactors