

ACRS (16)

Docket No. 50-263

OCT 15 1976

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

Gentlemen:

In response to your request dated January 26, 1976, and supplementary information dated July 2, 1976 the Commission has issued the enclosed Amendment No. 24 to Provisional Operating License No. DPR-22 for the Monticello Nuclear Generating Plant. The amendment consists of changes to the Technical Specifications to incorporate a revised testing frequency for the Control Rod Drive System. Your request has been modified as necessary to meet our requirements. The modifications have been discussed with your staff.

Copies of the related Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

Original signed by  
Dennis L. Ziemann

Dennis L. Ziemann, Chief  
Operating Reactors Branch #2  
Division of Operating Reactors

Enclosures:

1. Amendment No. 24 to License No. DPR-22
2. Safety Evaluation
3. Notice of Issuance

cc w/enclosures:  
See next page

*10/15/76 - 1600  
Called See Mayer @ NSP  
and informed him that  
amendment had been  
signed*

*988*

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DATE	10/12/76	10/12/76	10/14/76	10/15/76	

October 15, 1976

cc w/enclosures:

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

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

cc w/enclosures and copy of NSP  
filings dtd. 1/26/76 and 7/2/76:  
State Department of Health  
ATTN: Secretary and 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

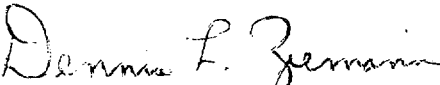
AMENDMENT TO PROVISIONAL OPERATING LICENSE

Amendment No. 24  
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 January 26, 1976, as supplemented by information dated July 2, 1976, 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.
3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Dennis L. Ziemann, Chief  
Operating Reactors Branch #2  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: October 15, 1976

ATTACHMENT TO LICENSE AMENDMENT NO. 24

FACILITY OPERATING LICENSE NO. DPR-22

DOCKET NO. 50-263

Replace existing pages listed below of the Technical Specifications with the attached revised pages. Changes on these pages are denoted by marginal line.

76

76a (new page)

86

### 3.0 LIMITING CONDITIONS FOR OPERATION

#### 2. Reactivity margin - stuck control rods.

Control rod drives which cannot be moved with control rod drive pressure shall be considered inoperable. The directional control valves for inoperable control rods shall be disarmed electrically and the rods shall be in such positions that Specification 3.3.A.1 is met. If more than six non-fully inserted rods are inoperable during power operation the reactor shall be placed in a shutdown condition. If a partially or fully withdrawn control rod drive cannot be moved with drive or scram pressure the reactor shall be brought to a shutdown condition within 48 hours unless investigation demonstrates that the cause of the failure is not due to a failed control rod drive mechanism collet housing.

#### B. Control Rod Withdrawal

1. Each control rod shall be coupled to its drive or completely inserted and the directional control valves disarmed electrically. This requirement does not apply when removing a control rod drive for inspection as long as the reactor is in the refueling mode.

### 4.0 SURVEILLANCE REQUIREMENTS

#### 2. Reactivity margin - stuck control rods.

Each partially or fully withdrawn operable control rod shall be exercised one notch at least once each week, with the exception that one rod in any two by two array need not be exercised more than one notch at least once each month. (This exception applies to cycle 5 but may be extended to subsequent cycles unless inspection of representative monthly exercised drives at end of each cycle shows abnormal piston tube or index tube degradation. Choice of monthly-exercised rods during each cycle shall be such that failure of all the monthly-tested rods to insert will not impair shutdown capability using the remaining rods). This test shall be performed at least once per 24 hours in the event power operation is continuing with two or more inoperable control rods or in the event power operation is continuing with one fully or partially withdrawn rod which cannot be moved and for which control rod drive mechanism damage has not been ruled out. The surveillance need not be completed within 24 hours if the number of inoperable rods has been reduced to less than two and if it has been demonstrated that control rod drive mechanism collet housing failure is not the cause of an immovable control rod.

B. Control Rod Withdrawal

1. The coupling integrity shall be verified for each withdrawn control rod as follows:

- (a) when the rod is fully withdrawn the first time subsequent to each refueling outage, observe that the drive does not go to the overtravel position; and

### Bases Continued 3.3 and 4.3:

The scram times for all control rods will be determined during each refueling outage. The weekly control rod exercise test serves as a periodic check against deterioration of the control rod system and also verifies the ability of the control rod drive to scram since if a rod can be moved with drive pressure, it will scram because of higher pressure applied during scram. Allowing for monthly exercising of one rod in any two by two array is consistent with the bases for local and overall core reactivity insertion rates assumed in the transient analyses discussed above. The frequency of exercising the control rods under the conditions of two or more control rods out of service provides even further assurance of the reliability of the remaining control rods.

The occurrence of scram times within the limits, but significantly longer than the average, should be viewed as an indication of a systematic problem with control rod drives especially if the number of drives exhibiting such scram times exceeds six, the allowable number of inoperable rods.

#### D. Control Rod Accumulators

The basis for this specification was not described in the FSAR and, therefore, is presented in its entirety. Requiring no more than one inoperable accumulator in any nine-rod square array is based on a series of XY PDQ-4 quarter core calculations of a cold, clean core. The worst case in a nine-rod withdrawal sequence resulted in a  $k_{eff} < 1.0$  -- other repeating rod sequences with more rods withdrawn resulted in  $k_{eff} > 1.0$ . At reactor pressures in excess of 800 psig, even those control rods with inoperable accumulators will be able to meet required scram insertion times due to the action of reactor pressure. In addition, they may be normally inserted using the control-rod-drive hydraulic system. Procedural control will assure that control rods with inoperable accumulators will be spaced in one-in-nine array rather than grouped together.

#### E. Reactivity Anomalies

During each fuel cycle excess operating reactivity varies as fuel depletes and as any burnable poison in supplementary control is burned. The magnitude of this excess reactivity is indicated by the integrated worth of control rods inserted into the core, referred to as the control rod inventory in the core. As fuel burnup progresses, anomalous behavior in the excess reactivity may be detected by comparison of actual rod inventory at any base equilibrium core state to predicted rod inventory at that state. Rod inventory predictions can be normalized to actual initial steady state rod patterns to minimize calculational uncertainties. Experience with other operating BWR's indicates that the control rod inventory should be predictable to the equivalent of one per cent in reactivity.





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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENT NO. 24 TO PROVISIONAL OPERATING LICENSE NO. DPR-22  
NORTHERN STATES POWER COMPANY  
MONTICELLO NUCLEAR GENERATING PLANT  
DOCKET NO. 50-263

INTRODUCTION

By letter dated January 26, 1976, with supplemental information dated July 2, 1976, Northern States Power Company (NSP) requested a change to the Technical Specifications appended to Provisional Operating License DPR-22 for the Monticello Nuclear Generating Plant. The proposed change involved revising the frequency for exercising all control rod drives from weekly to monthly. After discussions with the licensee's staff, the proposal was modified by the NRC to apply the monthly exercise interval to one rod out of any two-by-two array, thus allowing a maximum of 25% of the rods to be tested monthly.

EVALUATION

The proposed changes to the Technical Specifications would modify the control rod drive exercise interval from weekly to monthly to minimize the rapid local changes in power, and subsequent fuel damage, resulting from rod exercising. In previous Monticello fuel cycles NSP had observed a trend in which radioactive offgas emissions, indicative of failed fuel, increased linearly with the integrated number of control rod notches moved. Although new 8x8 and improved 7x7 fuel assemblies are believed to be more resistant to the harmful effects of thermal cycling imposed by control rod drive exercising, General Electric and NSP feel that extending the interval between drive exercises will result in a reduction of fuel thermal cycling. The NRC staff concurs with this opinion and feels that reduction of fuel failures and subsequent reduction of offgas emissions provide sufficient impetus to consider changes in the frequency of control rod exercises.

Weekly exercising is presently deemed important to identify a rod which is inoperable due to the complete failure of a collet retainer tube (CRT). However, (1) inspections of CRTs at Monticello have revealed no cracks to date; (2) observed cracks at other plants have not resulted in a single inoperable drive; and (3) in simulated environmental tests, control rods with cracked CRTs have undergone more scrams from operating temperature (by a factor of 9.7) than anticipated in the life of a reactor, with no failures to operate. Therefore we have concluded that the proposed reduced frequency of control rod exercising will not significantly increase the likelihood of a cracked CRT remaining undetected.

The possibility of crevice corrosion of the piston tubes and/or index tubes of the control rod drives as the result of less frequent rod exercising is also a consideration. Crevice corrosion of the index and/or piston tubes could result in seal deterioration and subsequent higher stall flows and longer control rod insertion times but would not be expected to make the rod inoperable. Although the crevice corrosion has not been positively related to the frequency of control rod drive exercising, the licensee has agreed to examine a representative sample of monthly-exercised rods at the end of each cycle to determine if crevice corrosion is taking place. Abnormal degradation of the piston tube or guide tube would require the exercising of all rods on a weekly frequency during future cycles. This requirement would be specified in the Technical Specifications.

It has been determined that, during the present fuel cycle, even in the unlikely event that all the control rods selected for monthly testing (1 in any 2x2 array, 25% of total rods) were to fail, the reactor would still be safely shut down by the remaining, weekly-exercised, rods. Such a restriction would be added to the technical specifications for the current and future cycles.

Based on the above we have concluded that the proposed change to the Monticello Technical Specifications, as modified, to permit monthly testing of 25% of control rod drives, is acceptable.

#### 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: October 15, 1976

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. 24 to Provisional Operating License No. DPR-22, issued to the 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 incorporated revised testing frequency for 25% of the control rod drives from weekly to monthly.

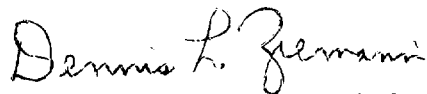
The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter 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 January 26, 1976, (2) supplemental information dated July 2, 1976, (3) Amendment No. 24 to License No. DPR-22, and (4) 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 copy of items (3) and (4) 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 15<sup>th</sup> day of October, 1976.

FOR THE NUCLEAR REGULATORY COMMISSION



Dennis L. Ziemann, Chief  
Operating Reactors Branch #2  
Division of Operating Reactors