August 26, 1987

Docket No. 50-263

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Mr. D. M. Musolf, Manager
Nuclear Support Services
Northern States Power Company
414 Nicollet Mall
Minneapolis, Minnesota 55401

Dear Mr. Musolf:

The Commission has issued the enclosed Amendment No. 50 to Facility Operating License No. DPR-22 for the Monticello Nuclear Generating Plant. This amendment is in response to your application dated February 18, 1987 with additional information provided by letter dated June 18, 1987.

The amendment revises Table 3.1.1 by eliminating the requirement for IRM operability while in the Run Mode and eliminates the APRM downscale Scram.

A copy of our related Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's next regular bi-weekly Federal Register notice.

Sincerely,

/S/

Dino C. Scaletti, Project Manager
Project Directorate III-3
Division of Reactor Projects

Enclosures:
1. Amendment No. 50 to License No. DPR-22
2. Safety Evaluation

cc w/enclosures:
See next page

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

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-263

MONTICELLO NUCLEAR GENERATING PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 50
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 February 18, 1987 as supplemented June 18, 1987, 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:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 50, 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

David L. Wigginton, Acting Director
Project Directorate III-3
Division of Reactor Projects

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 26, 1987

ATTACHMENT TO LICENSE AMENDMENT NO. 50

FACILITY OPERATING LICENSE NO. DPR-22

DOCKET NO. 50-263

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

REMOVE	INSERT
17	17
28	28
29	29
30	30
39	39
68	68

Bases Continued:

backed up by the rod worth minimizer. Worth of individual rods is very low in a uniform rod pattern. Thus, of all possible sources of reactivity input, uniform control rod withdrawal is the most probable cause of significant power rise. Because the flux distribution associated with uniform rod withdrawals does not involve high local peaks, and because several rods must be moved to change power by a significant percentage of rated power, the rate of power rise is very slow. Generally, the heat flux is in near equilibrium with the fission rate. In an assumed uniform rod withdrawal approach to the scram level, the rate of power rise is no more than 5% of rated power per minute, and the IRM system would be more than adequate to assure a scram before the power could exceed the safety limit. The IRM scram remains active until the mode switch is placed in the run position and the associated APRM is not downscale. This switch occurs when reactor pressure is greater than 850 psig.

The operator will set the APRM neutron flux trip setting no greater than that stated in Specification 2.3.A.1. However, the actual setpoint can be as much as 3% greater than that stated in Specification 2.3.A.1 for recirculation driving flows less than 50% of design and 2% greater than that shown for recirculation driving flows greater than 50% of design due to the deviations discussed on page 39.

B. Deleted

Amendment No. 29, 50

TABLE 3.1.1
REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENT REQUIREMENTS

Trip Function	Limiting Trip Settings	Modes in which function must be Operable or Operating** Refuel(3)	Startup	Run	Total No. of Instrument Channels per Trip System	Min. No. of Operable or Operating Instrument Channels Per Trip System(1)	Required Condition*
1. Mode Switch in Shutdown		X	X	X	1	1	A
2. Manual Scram		X	X	X	1	1	A
3. Neutron Flux IRM (See Note 2) a. High-High b. Inoperative	≤ 120/125 of full scale	X	X		4	3	A
4. Flow Referenced Neutron Flux APRM (See Note 5) a. High-High b. Inoperative	See Specifications 2.3A.1			X	3	2	A or B
5. High Reactor Pressure	≤ 1075 psig	X	X(f)	X(f)	2	2	A
6. High Drywell Pressure	≤ 2 psig	X(4)	X(e,f)	X(e,f)	2	2	A
7. Reactor Low Water Level	≥ 7 in.(6)	X	X(f)	X(f)	2	2	A
8. Scram Discharge Volume High Level a. East	≤ 56 gal.(8)	X(a)	X(f)	X(f)	2	2	A
b. West	≤ 56 gal.(8)	X(a)	X(f)	X(f)	2	2	A
9. Turbine Condenser Low Vacuum	≥ 23 in. Hg	X(b)	X(b,f)	X(f)	2	2	A or C

Amendment No. 77, 50

TABLE 3.1.1 - CONTINUED

Trip Function	Limiting Trip Settings	Modes in which function must be Operable or Operating**			Total No. of Instrument Channels per Trip System	Min. No. of Operable or Operating Instrument Channels Per Trip System(1)	Required Conditions*
		Refuel(3)	Startup	Run			
10. Main Steamline High Radiation	≤ 10 X Normal background at rated power	X	X(f)	X(f)	2	2	A
11. Main Steamline Isolation Valve Closure	≤ 10% Valve Closure	X(b)	X(b)	X	8	8	A or C
12. Turbine Control Valve Fast Closure	(See Note 7)			X(d,f)	2	2	D
13. Turbine Stop Valve Closure	≤ 10% Valve Closure			X(d)	4	4	D

NOTES:

1. There shall be two operable or tripped trip systems for each function.
2. For an IRM channel to be considered operable, its detector shall be fully inserted.
3. In the refueling mode with the reactor subcritical and reactor water temperature less than 212°F, only the following trip functions need to be operable: (a) Mode Switch in Shutdown, (b) Manual Scram, (c) High Flux IRM, (d) Scram Discharge Volume High Level.
4. Not required to be operable when primary containment integrity is not required.
5. To be considered operable, an APRM must have at least 2 LPRM inputs per level and at least a total of 14 LPRM inputs, except that channels 1, 2, 5, and 6 may lose all LPRM inputs from the companion APRM Cabinet plus one additional LPRM input and still be considered operable.

Amendment No. 50

6. Seven inches on the water level instrumentation is 10'6" above the top of the active fuel at rated power.

7. Trips upon loss of oil pressure to the acceleration relay.

8. Limited trip setting refers to the volume of water in the discharge volume receiver tank and does not include the volume in the lines to the level switches.

* Required Conditions when minimum conditions for operation are not satisfied.

A. All operable control rods fully inserted within 8 hours.

B. Power on IRM range or below and reactor in Startup, Refuel, or Shutdown mode.

C. Reactor in Startup or Refuel mode and pressure below 600 psig.

D. Reactor power less than 45% (751.5 MWt.).

** Allowable Bypass Conditions

It is permissible to bypass:

a. The scram discharge volume High Water Level scram function in the refuel mode to allow reactor protection system reset. A rod block shall be applied while the bypass is in effect.

b. The Low Condenser vacuum and MSIV closure scram functions in the Refuel and Startup modes if reactor pressure is below 600 psig.

c. Deleted.

d. The turbine stop valve closure and fast control valve closure scram functions when the reactor thermal power is $\leq$ 45%(751.5 MWt).

Amendment No. 11, 50

Bases Continued:

3.1 The IRMs are calibrated by the heat balance method such that 120/125 of full scale on the highest IRM range is below 20% of rated neutron flux (see Specification 2.3.A.2). The requirement that the IRM detectors be inserted in the core assures that the heat balance calibration is not invalidated by the withdrawal of the detector.

Although the operator will set the set points within the trip settings specified on Table 3.1.1, the actual values of the various set points can differ appreciably from the value the operator is attempting to set. The deviations could be caused by inherent instrument error, operator setting error, drift of the set point, etc. Therefore, such deviations have been accounted for in the various transient analysis and the actual trip settings may vary by the following amounts.

Trip Function	Deviation	Trip Function	Deviation
3. High Flux IRM	+2/125 of scale	7. Reactor Low Water Level	-6 inches
5. High Reactor Pressure	+10 psi	8. Scram Discharge Volume High Level	+1 gallon
6. High Drywell Pressure	+1 psi	9. Turbine Condenser Low Vacuum	-½ in. Hg

A violation of this specification is assumed to occur only when a device is knowingly set outside of the limiting trip setting, or a sufficient number of devices have been affected by any means such that the automatic function is incapable of operating within the allowable deviation while in a reactor mode in which the specified function must be operable, or the actions specified in 3.1.B.2 are not initiated as specified.

If an unsafe failure is detected during surveillance testing, it is desirable to determine as soon as possible if other failures of a similar type have occurred and whether the particular function involved is still operable or capable of meeting the single failure criterion. To meet the requirements of Table 3.1.1, it is necessary that all instrument channels in one trip system be operable

Amendment No. 50

Bases Continued:

3.2 The RBM bypass time delay is set low enough to assure minimum rod movement while upscale trips are bypassed.

The IRM rod block function provides local as well as gross core protection. The scaling arrangement is such that trip setting is less than a factor of 10 above the indicated level. Analysis of the worst case accident results in rod block action before MCPR approaches the Safety Limit (T.S.2.1.A).

A downscale indication of an APRM or IRM is an indication the instrument has failed or the instrument is not sensitive enough. In either case the instrument will not respond to changes in control rod motion and thus control rod motion is prevented. The downscale rod blocks assure that there will be proper overlap between the neutron monitoring systems and thus, that adequate coverage is provided for all ranges of reactor operation. The downscale trips are set at 3/125 of full scale.

For effective emergency core cooling for the small pipe break the HPCI or Automatic Pressure Relief system must function since for these breaks, reactor pressure does not decrease rapidly enough to allow either core spray or LPCI to operate in time. The arrangement of the tripping contacts is such as to provide this function when necessary and minimize spurious operation. The trip settings given in the specification are adequate to assure the above criteria is met. Reference Section 6.2.4 and 6.2.6 FSAR. The specification preserves the effectiveness of the system during periods of maintenance, testing, or calibration, and also minimizes the risk of inadvertent operation; i.e., only one instrument channel out of service.

Six radiation monitors (two reactor building vent plenum, two reactor building vent wide range gas and two refueling floor) are provided which initiate isolation of the reactor building and operation of the standby gas treatment system following a refueling accident. The monitors measure radioactivity in the reactor building ventilation exhaust and on the refueling floor. One upscale trip signal or two downscale/inoperable trip signals, from a pair of monitors performing the same function, will cause the desired action. Trip settings of 100 mR/hr for the reactor building vent plenum monitors and the refueling floor monitors are based upon initiating normal ventilation isolation and standby gas treatment system operation so that none of the activity released during the refueling accident leaves the reactor building via the normal ventilation stack but that all the activity is processed by the standby gas treatment system. The reactor building vent wide range gas monitors trip settings will be calculated in accordance with NRC approved methods in the ODCM to ensure that the alarm/trip will occur prior to exceeding the limits of 10CFR Part 20.

The recirculation pump trip description and performance analysis is discussed in Topical Report NEDO-25016, September 1976, "Evaluation of Anticipated Transients Without Scram for the Monticello Nuclear Generating Plant". (See September 15, 1976 letter from Mr L O Mayer, NSP, to Mr D L Ziemann, USNRC.) The pump trip is provided to minimize reactor pressure in the highly unlikely event of a plant transient coincident with the failure of all control rods to scram. The rapid flow reduction

Amendment No. 29,40,50

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 50 TO FACILITY OPERATING LICENSE NO. DPR-22

NORTHERN STATES POWER COMPANY
MONTICELLO NUCLEAR GENERATING PLANT
DOCKET NO. 50-263

1.0 INTRODUCTION

By application dated February 18, 1987 and additional information submitted on June 18, 1987, Northern States Power Company (the licensee) requested an amendment to the Technical Specification for Facility Operating License No. DPR-22 for the Monticello Nuclear Generating Plant. The amendment would clarify the Technical Specification operability requirements for Intermediate Range Monitor (IRM) and Average Power Range Monitor (APRM) scram instrumentation. This change will provide relief to the licensee from the Technical Specification requirement of placing the plant in a "half scram" condition while performing required APRM channel testing and maintenance activities.

2.0 DISCUSSIONS

The Monticello Technical Specification Table 3.1.1, Reactor Protection System (scram) Instrument Requirements, item 3, requires that the IRM channels be capable of performing a scram function while the reactor is in the RUN mode. Note c indicates that this scram function is permissible to be bypassed when the associated APRM is operable and indicating at least 3/125 full scale. The proposed change will delete this requirement and the note c.

Table 3.1.1 item 4.e requires that at Neutron Flux APRM Downscale condition trips the reactor while the reactor plant is in the RUN mode. The proposed change will delete this requirement.

The licensee stated that two problems exist with the Technical Specifications in Table 3.1.1. The first problem involves the requirement for an APRM downscale scram. The second problem involves the bypassing of the APRM channels.

By examining the circuitry of IRM/APRM scram circuits (Fig. 1 in February 18, 1987 submittal), the APRM downscale scram function is bypassed by the IRM circuit even when the reactor mode switch is in the RUN position. The wording of the current Technical Specification implies that an APRM downscale should cause a half scram. The APRM Downscale Scram function exists in several early BWR plants including Monticello, but this function was deleted in the later BWR plants and the requirement removed from the standard BWR Technical Specification (NUREG-0123, Revision 3). The licensee has stated that the only function performed by the APRM Downscale Scram is during the plant startup or shutdown. This scram function will provide protection against operator error if the reactor mode switch was improperly switched. During a normal plant startup, the mode switch is placed in RUN position when the power is above 5%. If an operator were to prematurely place the mode switch in the RUN position, the APRM will be Downscale and the IRM Scram function will not be bypassed (the IRM Scram circuit will be bypassed when the mode switch is in RUN position and the APRM's are not downscale). If this should happen, all safety concerns are addressed without reliance on the APRM downscale scram function. The Control Rod Drop Accident is prevented by the APRM scram at the 120% thermal power setpoint, and the Rod Withdrawal Error is prevented by the APRM Downscale Rod Block system. Prematurely placing the mode switch in the RUN mode is also protected by the main steam isolation valve (MSIV) closure scram function (due to low steamline pressure when the reactor mode switch is placed in RUN). Another example of operator error can occur during power descent if the operator delays changing the reactor mode switch from the RUN mode to the STARTUP mode, thus bypassing the IRM's for a longer period of time and to a lower power level. The consequences of this error are no different than those described above for power ascension. The Control Rod Drop Accident and the Rod Withdrawal Error are protected by the APRM scram and the Rod Block system.

The IRM and the APRM Scram circuits are associated. When an APRM is bypassed the associated IRM is also bypassed. There are eight IRM channels while only six APRM channels. Each Reactor Trip System (half scram logic) requires a minimum of three IRM channels and two APRM channels operational to satisfy the Technical Specification requirements. The APRM Channel No. 3 and No. 4 each have two IRM's associated with them. During a channel test or maintenance of APRM Channels, bypassing APRM Channel No. 3 will also bypass IRM Channels No. 13 and No. 14. Bypassing APRM Channel No. 4 will bypass IRM channels No. 15 and No. 18. The minimum number of operable IRM channels cannot be met whenever APRM Channel No. 3 or No. 4 is bypassed. Therefore, the plant has to be in a "half scram" condition while performing an APRM channel testing and maintenance. The proposed change will eliminate this requirement during testing and maintenance of the APRM channels as discussed above.

3.0 EVALUATION

The staff has reviewed the schematic diagram of the IRM/APRM scram circuitry and the justification for removal of APRM Downscale Trip. The Technical Specification changes do not involve any modification of the reactor protection system wiring or circuitry. The proposed changes clarify the intent of the original specification by clearly defining the scram functions needed to be operable in each mode of operation. The licensee is taking credit on the APRM scram and the APRM downscale trip in the Control Rod Block actuation circuitry. Since both the APRM scram and the Control Rod Block actuation circuitries are required by the plant Technical Specifications for operability and surveillance testing, there is reasonable assurance that those circuitries will perform their protective functions when needed. Furthermore, the plant procedures instruct the operator to place the reactor mode switch in "RUN" position when the APRM's indicate above 5% power with all the downscale control board lights off. The APRM downscale scram setpoint is 3/125 full scale. The power level for switching the mode switch is above the APRM downscale scram setpoint. The staff has verified that the standard BWR Technical Specification and all later plants do not require the APRM Downscale Scram nor the IRM Scram when the reactor is in RUN mode. Based on its review, the staff finds that the proposed changes are acceptable.

4.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change to 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this 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 this amendment.

5.0 CONCLUSION

The staff 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; and (2) 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.

Principal Contributor: H. Li

Dated: August 26, 1987