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Docket Nos. 50-282 ✓
and 50-306

MARCH 2 8 1978

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 applications dated August 27, 1976, and January 4, 1977, supplemented by your letters dated August 10, 1977 and August 31, 1977, the Commission has issued the enclosed Amendment Nos. 28 and 22 to Facility Operating License Nos. DPR-42 and DPR-60 for the Prairie Island Nuclear Generating Plant Unit Nos. 1 and 2, respectively.

The amendment consists of miscellaneous revisions to the Technical Specifications that relate to a change in negative rate trip set-points, and a change in the intermediate range high flux trip limit. The miscellaneous changes correct errors and omissions which were requested in the January 4, 1977 application were included in Amendments 19 and 13 dated March 11, 1977. The proposed surveillance program to monitor containment air and shell temperatures and the annulus air temperature requested in your August 27, 1976 application are still under review and will be the subject of a future action.

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

Sincerely,

/s/

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Enclosures:
1. Amendment Nos. 28 and 22 to License Nos. DPR-42 and DPR-60
2. Safety Evaluation
3. Notice

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DATE ➤	3/1/78	3/1/78	2/23/78	2/28/78		

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

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-282

PRAIRIE ISLAND NUCLEAR GENERATING PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 28
License No. DPR-42

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by the Northern States Power Company (the licensee) dated August 27, 1976, and January 4, 1977, as supplemented by letters dated August 10 and 31, 1977, comply 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 License No. DPR-42 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 28, 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

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 28, 1978

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

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-306

PRAIRIE ISLAND NUCLEAR GENERATING PLANT UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 22
License No. DPR-60

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The applications for amendment by the Northern States Power Company (the licensee) dated August 27, 1976, and January 4, 1977, as supplemented by letters dated August 10 and 31, 1977, comply 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 License No. DPR-60 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 22, 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

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 28, 1978

ATTACHMENT TO LICENSE AMENDMENT NOS. 28 AND 22

FACILITY OPERATING LICENSE NOS. DPR-42 AND DPR-60

DOCKET NOS. 50-282 AND 50-306

Replace the following pages of the Technical Specifications contained in Appendix A of the above-indicated licenses with the attached pages bearing the same numbers, except as otherwise indicated. The changed areas on the revised pages are reflected by a marginal line.

Remove	Insert
TS.2.3-1	TS.2.3-1
TS.2.3-3	TS.2.3-3
TS.6.1-1	TS.6.1-1*

*This page corrects a typographical error in amendments 26/20 dated February 14, 1978.

2.3 LIMITING SAFETY SYSTEM SETTINGS, PROTECTIVE INSTRUMENTATION

Applicability

Applies to trip settings for instruments monitoring reactor power and reactor coolant pressure, temperature, flow, and pressurizer level.

Objective

To provide for automatic protective action in the event that the principal process variables approach a safety limit.

Specification

A. Protective instrumentation settings for reactor trip shall be as follows:

1. Startup protection

   a. High flux, intermediate range (high set point) - current equivalent to ≤40% of full power.

   b. High flux, power range (low set point) - ≤25% of rated power.

   c. High flux, source range - neutron flux $\leq 10^6$ counts/second

2. Core protection

   a. High flux, power range (high set point) - ≤108% of rated power.

   b. High pressurizer pressure - ≤2385 psig.

   c. Low pressurizer pressure - ≥1815 psig.

   d. Overtemperature ΔT

$$\Delta T_t \leq \Delta T_o \left[K_1 - K_2(T-T')\left(\frac{1+\tau_1 s}{1+\tau_2 s}\right) + K_3(P-P') - f(\Delta I)\right]$$

where

ΔT_o	=	Indicated ΔT at rated power
T	=	Average temperature, ^oF
T'	=	566.1^oF
P	=	Pressurizer pressure, psig
P'	=	psig 2235
K_1	≤	1.11
K_2	=	0.0090
K_3	=	0.000566
τ_1	=	30 sec.
τ_2	=	4 sec.

Amendment No. 28 to DPR-42
Amendment No. 22 to DPR-60

K_6 = 0.002 for T > T', 0 for T < T'
τ_1 = 10, sec
f(ΔI) as defined in d. above.

f. Low reactor coolant flow per loop - ≥90% of normal indicated loop flow as measured at loop elbow tap.

g. Open reactor coolant pump motor breaker.

(1) Reactor coolant pump bus undervoltage - ≥75% of normal voltage.

(2) Reactor coolant pump bus underfrequency - ≥58.2HZ

h. Power range neutron flux rate.

(1) Positive rate - ≤ 15% of rated power with a time constant ≥ 2 seconds

(2) Negative rate - ≤ 15% of rated power with a time constant ≥ 2 seconds

3. Other reactor trips

a. High pressurizer water level - ≤90% of narrow range instrument span.

b. Low-low steam generator water level - ≥5% of narrow range instrument span.

c. Low steam generator water level - ≥15% of narrow range instrument in coincidence with steam/feedwater mismatch flow - ≤1.0 x 10^6 lbs/hr.

d. / Turbine Generator trip

(1) Turbine stop valve indicators - closed

(2) Low auto stop oil pressure - ≥45 psig

e. Safety injection - See Specification 3.5

B. Protective instrumentation settings for reactor trip interlocks shall be as follows:

1. "At power" reactor trips that are blocked at low power (low pressurizer pressure, high pressurizer level, and loss of flow for one or two loops) shall be unblocked whenever:

a. Power range neutron flux is ≥12% of rated power or,

b. Turbine load is ≥10% of full load turbine impulse pressure.

6.0 ADMINISTRATIVE CONTROLS

6.1 ORGANIZATION

A. The Plant Manager has the overall full-time onsite responsibility for safe operation of the facility. During periods when the Plant Manager is unavailable, he may delegate this responsibility to other qualified supervisory personnel.

B. The Northern States Power corporate organizational structure relating to the operation of this plant is shown in Figure TS.6.1-1.

C. The functional organization for operation of the plant shall be as shown in Figure TS.6.1-2 and:

1. Each on duty shall be composed of at least the minimum shift crew composition shown in Table TS.6.1-1.

2. For each reactor that contains fuel: a licensed operator in the control room.

3. At least two licensed operators shall be present in the control room during a reactor startup, a scheduled reactor shutdown, and during recovery from a reactor trip. These operators are in addition to those required for the other reactor.

4. An individual qualified in radiation protection procedures shall be on site when fuel is in a reactor.

5. All refueling operations shall be directly supervised by a licensed Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling who has no other concurrent responsibilities during this operation.

6. A fire brigade of at least three members shall be maintained on site at all times. The fire brigade shall not include the six members of the shift organization required for safe shutdown of the reactors or more than one member of the site security force.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NOS. 28 AND 22 TO FACILITY LICENSE NOS. DPR-42 AND DPR-60

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT UNIT NOS. 1 AND 2

DOCKET NOS. 50-282 AND 50-306

INTRODUCTION

By applications dated August 27, 1976, and January 4, 1977, supplemented by letters dated August 10 and August 31, 1977, Northern States Power Company (NSP) requested amendments to Facility License Nos. DPR-42 and DPR-60 for the Prairie Island Nuclear Generating Plant Unit Nos. 1 and 2 (PINGP). The proposed amendments would include provisions to allow for the following:

1. A change in negative rate trip setpoint, and

2. A change in the intermediate range high flux trip limit.

The one remaining portion of the application dated August 27, 1976, relating to a proposed surveillance program to monitor containment air and shell temperatures and the annulus air temperature, is still under review and will be the subject of a future action.

DISCUSSION

The details of the proposed changes in the Technical Specifications that are included in these amendments are as described in the following paragraphs.

Item 1 - a change in the negative rate trip setpoint: The negative rate trip circuit is designed to detect dropped rod cluster control assemblies (RCCA's) and trip the reactor before the core can return to high power with an adverse core power distribution. Reactor trip is not required for single rod drops; however, several instances of single rod drops at Prairie Island have caused the plant to trip on negative rate. The present setpoints were chosen on a generic basis for all Westinghouse plants including high power density plants with

minimum DNB margin; therefore, NSP issued a request to Westinghouse to investigate if these setpoints could be relaxed on PINGP and still ensure plant safety. The investigation demonstrated that the rate setpoint could be increased to -15% of rated power.

Item 2 - a change in the intermediate range high flux trip limit: Setpoint drift, apparently due to power distribution changes with burnup and the small sensitive volume of the intermediate range detectors, has caused two violations of the current trip setpoint. These were reported as Abnormal Occurrence 75-32 and Reportable Occurrence 76-9. The intermediate range trip cannot be set too conservatively, to make allowances for the drift, since the rod stop may fall too close to the P-10 permissive.

The requested change would provide sufficient margin to allow for the drift and prevent future violations of this limit.

EVALUATION

On the basis of our evaluation of the two items discussed above, we conclude that the changes are acceptable. The detailed staff evaluation follows:

Item 1 - NSP has requested that the negative rate trip setpoints on PINGP be increased in absolute magnitude from -10% to -15% of rated thermal power (RTP) in a 2-second period. The reason for the change is to prevent spurious trips resulting from single rod drops. Reactor trip is not required for single rod drops.

Credit is taken for the negative rate trip only in the analysis of a double rod drop accident. The present -10% RTP setpoint was chosen on a generic basis for all Westinghouse plants, including plants with a higher power density than the Prairie Island units. A plant-specific analysis revealed that the smallest possible worth double-rod drop in the PINGP units inserts -0.29% of reactivity into the core, causing a 27% RTP reduction in 2 seconds. The uncertainty in this power change figure is 4% RTP. Therefore, a setpoint of -15% RTP will still cause a reactor trip well before the return to power.

Based on the above evaluation, the staff finds this proposed change to be acceptable.

Item 2 - NSP has requested an increase in the intermediate range monitor (IRM) - high flux setpoint to <40% RTP. The reason for this request is the rather considerable drift rate that these localized detectors experience in terms of cross core thermal power. Thus NSP has experienced incidents with the PINGP units during startup where the setpoint was properly set according to available data, but the calibration was discovered to be in error later on in the power ascension program, resulting in an inadvertent technical specification violation. At the same time, if the licensee sets the setpoint too low in an attempt to avoid the problem, a rod block will prevent power ascension before the plant leaves the mode where the IRMs are active.

This problem is by no means new, and more modern technical specifications specify both a "trip setpoint" and a range of "allowable values". The licensee is expected to attempt to comply with the trip setpoint, but as long as subsequent testing shows the setpoint to be within the range of allowable values, there is no violation of the technical specifications.

The current Prairie Island Technical Specifications require that the IRM trip be set <25% RTP. The licensee has proposed that the value be changed to $\leq$40% RTP. (A nominal value of 30% will be used in actual control room procedures). This IRM trip is active only in the Rod Ejection Accident from Hot Zero Power and in the Bank Withdrawal from Subcritical accident. The FSAR analyses for these accidents do not take credit for the IRM trip, but instead assume that the scram is initiated by the Power Range High Nuclear Flux Trip. Therefore, the proposed change to the IRM trip setpoint has no effect on the FSAR analyses.

NSP has reanalyzed the Bank Withdrawal from Subcritical accident assuming the Power Range trip fails and the IRM trip occurs at 50% RTP (40% + 10% error allowances). The results of this analysis were acceptable to the staff. The Rod Ejection from Subcritical accident was not reanalyzed. However, because rod ejection accidents are initially terminated by Doppler feedback, the analysis is relatively insensitive to scram timing, and the change to 50% RTP should have a negligible effect on the analysis of this accident.

Based on the staff review of the additional analysis, and the fact that the Power Range trip will remain in effect in any case, the staff finds the proposed change to be acceptable.

ENVIRONMENTAL CONSIDERATION

We have determined that the amendments do 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 amendments involve 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 these amendments.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendments do not involve a significant increase in the probability or consequences of accidents previously considered and do not involve a significant decrease in a safety margin, the amendments do 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 the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: March 28, 1978

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NOS. 50-282 AND 50-306

NORTHERN STATES POWER COMPANY

NOTICE OF ISSUANCE OF AMENDMENTS TO FACILITY OPERATING LICENSES

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment Nos. 28 and 22 to Facility Operating License Nos. DPR-42 and DPR-60, issued to the Northern States Power Company (the licensee), which revised Technical Specifications for operation of Unit Nos. 1 and 2 of the Prairie Island Nuclear Generating Plant (the facilities) located in Goodhue County, Minnesota. The amendments are effective as of their date of issuance.

The amendments revised the Technical Specifications for the facilities to permit a change in negative rate trip setpoints and a change in the intermediate range high flux trip limit.

The applications for the amendments comply 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 amendments. Prior public notice of these amendments was not required since the amendments do not involve a significant hazards consideration.

The Commission has determined that the issuance of these amendments 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 the amendments.

For further details with respect to this action, see (1) the applications for amendments dated August 27, 1976, and January 4, 1977 and supplements dated August 10, 1977 and August 31, 1977, (2) Amendment Nos. 28 and 22 to License Nos. DPR-42 and DPR-60, respectively, 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 of the 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 March, 1978.

FOR THE NUCLEAR REGULATORY COMMISSION

A. Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors