JUN 11 1975

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Docket Nos. 50-282
and 50-306

Northern States Power Company
ATTN: Mr. L. O. Mayer
Director of Nuclear Support
Services
414 Nicollet Mall
Minneapolis, Minnesota 55401

Gentlemen:

The Commission has issued the enclosed Amendment Nos. 8 and 3 to Facility License Nos. DPR-42 and DPR-60 for Units 1 and 2 of the Prairie Island Nuclear Generating Plant. These amendments include Change No. 8 to the Technical Specifications and are in response to your request dated November 6, 1974.

These amendments permit an increase in the volume of borated water in the facilities' accumulator tanks to the level required to conform with the Acceptance Criteria for Emergency Core Cooling Systems.

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

Sincerely,

Original signed by
Dennis L. Ziemann

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

Enclosures:
1. Amendment No. 8 to DPR-42 w/Change No. 8
2. Amendment No. 3 to DPR-60 w/Change No. 8
3. Safety Evaluation
4. Federal Register Notice

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SURNAME ▶	x7403:esp RMDiggs	DiBesechto for BBuckley	CHBerlinger	Karlalia G. Lewis	DLZiemann	
DATE ▶	5/6/75	5/6/75	5/8/75	6/9/75	6/11/75	

Form AEC-318 (Rev. 9-53) AECM 0240 GPO e43—16—81465-1 445-678

Northern States Power Company

JUN 11 1975

cc
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Minneapolis, Minnesota 55401

Mr. Bernard Cranum
Area Director
Bureau of Indian Affairs
U. S. Department of Interior
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Mr. John E. Davidson
Goodhue County Board of Commissioners
321 West Third Street
Red Wing, Minnesota 55066

cc w/enclosures and cy of NSPCo
filing dtd. 11/6/74:
Mr. Richard D. Cudahy, Chairman
Public Service Commission
of Wisconsin
Hill Farms State Office Building
Madison, Wisconsin 53702

Warren H. Lawson, M. D.
Secretary and Executive Officer
State Department of Health
University Campus
Minneapolis, Minnesota 55440

Mr. Gary Williams
Federal Activities Branch
Environmental Protection Agency
230 South Dearborn Street
Chicago, Illinois 60604

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-282

PRAIRIE ISLAND NUCLEAR GENERATING PLANT UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 8
License No. DPR-42

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

   A. The application for amendment by the Northern States Power Company (the licensee) dated November 6, 1974, 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; and

   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.

2. Accordingly, the license is amended by a change 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:

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"(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. 8."

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

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by
Dennis L. Ziemann

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

Attachment:
Change No. 8 to the
Technical Specifications

Date of Issuance: JUN 11 1975

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ATTACHMENT TO LICENSE AMENDMENT NOS. 8 AND 3

CHANGE NO. 8 TO THE TECHNICAL SPECIFICATIONS

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

DOCKET NOS. 50-282 AND 50-306

Replace page 3.3-1 of the Appendix A Technical Specifications with the attached revised page 3.3-1. The changed area on the revised page is shown by a marginal line.

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3.3 ENGINEERED SAFETY FEATURES

Applicability

Applies to the operating status of the engineered safety features.

Objective

To define those limiting conditions that are necessary for operation of engineered safety features: (1) to remove decay heat from the core in an emergency or normal shutdown situations, and (2) to remove heat from containment in normal operating and emergency situations.

Specification

A. Safety Injection and Residual Heat Removal Systems

1. A reactor shall not be made or maintained critical nor shall it be heated or maintained above 200°F unless the following conditions are satisfied except as permitted in Specification 3.3.A.2

   a. The refueling water tank contains not less than 200,000 gallons of water with a boron concentration of at least 1950 ppm.

   b. Each accumulator is pressurized to at least 700 psig and each contains from 1250 Ft^3 to 1282.9 Ft^3 of borated water with a boron concentration of at least 1900 ppm, and is not isolated. 8

   c. Two safety injection pumps are operable except that pump control switches in the control room may be in the "pullout" position whenever the steam bubble is not established in the Pressurizer.

   d. Two residual heat removal pumps are operable.

   e. Two residual heat exchangers are operable.

   f. Automatic valves, interlocks and piping associated with the above components and required to function during accident conditions, are operable.

   g. Manual valves in the above systems that could (if one is improperly positioned) reduce injection flow below that assumed for accident analysis, shall be blocked and tagged in the proper position for injection. During power operation, changes in valve position will be under direct administrative control.

   h. For Unit 1 operation, the following valve conditions shall exist:

      (1) Safety injection system motor-operated valves 8801A, 8801B, 8806A shall have valve position monitor lights operable and shall be locked in the open position by having the motor control center supply breakers physically locked open.

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NOS. 8 AND 3 TO LICENSE NOS. DPR-42 AND DPR-60

(CHANGE NO. 8 TO THE TECHNICAL SPECIFICATIONS)

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

DOCKET NOS. 50-282 AND 50-306

INTRODUCTION

By letter dated October 2, 1974 we informed the Northern States Power Company (NSP) of a potential discrepancy between the accumulator water volume as described in their proposed Technical Specifications, dated September 6, 1974, and submitted pursuant to 10 CFR 50.46 and the existing Technical Specifications established for the purpose of compliance with the Interim Acceptance Criteria (IAC). By letter dated November 6, 1974, Northern States Power Company submitted a proposed change to the Technical Specifications with regard to increasing the volume of borated water in the accumulator tanks to the Acceptance Criteria (AC) level for emergency core cooling systems (ECCS). The proposed change would modify accumulator water level to be consistent with the initial conditions assumed in the loss-of-coolant accident analysis required by 10 CFR 50.46 and submitted by the licensee on September 6, 1974.

EVALUATION

During the course of review of the submittals by various licensees of new ECCS performance evaluations in accordance with 10 CFR 50.46, in the fall of 1974, it was noted by the staff that there were inconsistencies between the technical specifications existing for compliance with the Commission's former Interim Acceptance Criteria (IAC) and those proposed for compliance with the Acceptance Criteria of 10 CFR 50.46 and Appendix K. Since compliance with both sets of specifications was required by 10 CFR 50.46, the staff on October 2, 1974 wrote all licensees of operating Westinghouse nuclear steam supply systems a letter which requested that possible inconsistencies between the existing Interim Acceptance Criteria (IAC) and proposed Acceptance Criteria (AC) Technical Specifications, with regard to the emergency core cooling system (ECCS), be identified and reviewed. The responses to that letter indicated in most cases that the IAC and AC Technical Specification limits with regard to the accumulator water volume were inconsistent.

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Although the water levels used for the licensee's Appendix K evaluations were higher than those previously used for IAC evaluations, and 10 CFR 50.46 AC limits are more restrictive than the IAC criteria, the staff review indicated that the AC evaluations did not wholly conform to the Commission's evaluation model requirements in Appendix K. The Commission's Order of December 27, 1974 imposed further restriction on facility operation. Since the evaluation models were not wholly in conformity with the Commission's regulation, it could not be simply assumed that the water level used for the AC evaluations was the appropriate level and would assure compliance with both the IAC and the 10 CFR 50.46 criteria. The effect of water level on calculational results of the models was assessed, and the staff determined that the higher levels were appropriate to assure compliance with both sets of criteria as is required by 10 CFR 50.46 and the Commission's December 27, 1974 Order. Applicant was informed of this on October 2, 1974.

The enclosed amendment simply clarifies the apparent inconsistency between the level set forth in the previously approved technical specifications based on the IAC, and the requirement of 10 CFR 50.46 that the facility comply with the AC as well as the IAC. To assure that the higher water level associated with the AC evaluation did not adversely effect the results of the approved IAC evaluations, we assessed this effect of the higher water levels on the IAC evaluation. For Westinghouse reactors the increased accumulator water volume results in a more sluggish accumulatory performance and in a longer accumulator injection period. This results in a longer time required to refill the lower plenum and a delay in the start of the core cooling (reflood) period. In addition, the approved Westinghouse IAC ECCS evaluation model included an assumption that during accumulator injection the cold legs were to be plugged. This assumption was made conservatively at that time since injection section steam water mixing data was not available. Subsequent data has verified this approach to be overly conservative and is not included in the Westinghouse AC evaluation model. The IAC analysis with increased accumulator water volume therefore resulted in both an extension of accumulator injection and cold leg plugging periods. These effects contributed to an increase in the calculated peak clad temperature when using the IAC model.

On the other hand, for plants analyzed for which the downcomer was not full at the time the accumulators emptied, a benefit was obtained by increasing the accumulator water level resulting from the higher elevation head and reflooding rates associated with increased downcomer water levels.

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Our evaluation of operating two and three-loop plants (Prairie Island Units 1 and 2 are two loop plants) shows a reduction in the calculated peak clad temperature for the IAC analysis, indicating that the IAC Technical Specification limits for accumulator water volume should be increased to the higher proposed Appendix K ECCS analysis values. This was due to the fact that for the cases in which the downcomer water level was less than 13 feet, as is the case with Prairie Island Units 1 and 2, the benefit due to increased downcomer water level (increased reflood rate) was greater than the penalties resulting from delayed refill/reflood and extended cold leg plugging. Consequently, the higher water levels would not adversely affect peak clad temperature calculated using the IAC. The peak clad temperature using the 10 CFR 50.46 acceptance criteria models already were based upon the higher accumulator water volume, and with the additional restrictions imposed by the Commission's December 27, 1974 Order would assure conformance with the acceptance criteria of 10 CFR 50.46(b).

We have concluded that the licensee's proposed change to increase the normal range of stored borated water volume from 1200 ft^3-1232 ft^3 to 1250 ft^3-1282 ft^3 will satisfy both the IAC and the AC and is acceptable.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the change 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 change 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: JUN 11 1975

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DATE ➤						

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

Notice is hereby given that the U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment Nos. 8 and 3 to Facility Operating License Nos. DPR-42 and DPR-60, issued to the Northern States Power Company (the licensee), which revised the Technical Specifications for operation of Units 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 authorize an increase in the volume of borated water in the facilities' accumulator tanks consistent with the level required to conform with the Acceptance Criteria of the Commission, in accordance with the licensee's application dated November 6, 1974.

The application for the amendments 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 amendments. Prior public notice of these amendments is not required since the amendments do not involve a significant hazards consideration.

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For further details with respect to these actions, see (1) the application for amendments dated November 6, 1974, (2) Amendment Nos. 8 and 3 to License Nos. DPR-42 and DPR-60, with Change No. 8, and (3) the Commission's concurrently issued 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 (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Reactor Licensing.

Dated at Bethesda, Maryland, this 11 day of June 1975.

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by
Dennis L. Ziemann

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

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SURNAME ▶						
DATE ▶						

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NOS. 8 AND 3 TO LICENSE NOS. DPR-42 AND DPR-60

(CHANGE NO. 8 TO THE TECHNICAL SPECIFICATIONS)

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

DOCKET NOS. 50-282 AND 50-306

INTRODUCTION

By letter dated October 2, 1974 we informed the Northern States Power Company (NSP) of a potential discrepancy between the accumulator water volume as described in their proposed Technical Specifications, dated September 6, 1974, and submitted pursuant to 10 CFR 50.46 and the existing Technical Specifications established for the purpose of compliance with the Interim Acceptance Criteria (IAC). By letter dated November 6, 1974, Northern States Power Company submitted a proposed change to the Technical Specifications with regard to increasing the volume of borated water in the accumulator tanks to the Acceptance Criteria (AC) level for emergency core cooling systems (ECCS). ~~The purpose of the licensee's~~ proposed change would help accumulator water levels to be ~~is~~ consistent with the initial conditions assumed in the loss-of-coolant accident analysis required by 10 CFR 50.46 and submitted by the licensee on September 6, 1974.

EVALUATION

(A) On October 2, 1974 ~~a letter was sent~~ wrote to all licensees of operating Westinghouse nuclear steam supply systems which requested that possible inconsistencies between the existing Interim Acceptance Criteria (IAC) and proposed Acceptance Criteria (AC) Technical Specifications, with regard to the emergency core cooling system (ECCS), be identified and reviewed. The responses to that letter indicated in most cases that the IAC and AC Technical Specification limits with regard to the accumulator water volume were inconsistent. ~~It is required that the plants operate within the limits of both the IAC and the proposed higher AC accumulator water volume limits.~~

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(B) →

~~Our evaluation of~~ Westinghouse reactors in[redacted] the increased accumulator water volume results in a more sluggish accumulator performance and in a longer accumulator injection period. This results in a longer time required to refill the lower plenum and a delay in the start of the core cooling (reflood) period. In addition, the approved Westinghouse IAC ECCS evaluation model included an assumption that during accumulator injection the cold legs were to be plugged. This assumption was made conservatively at that time since injection section steam water mixing data was not available. Subsequent data has verified this approach to be overly conservative and is not included in the Westinghouse AC evaluation model. The IAC analysis with increased accumulator water volume therefore resulted in both an extension of accumulator injection and cold leg plugging periods. These effects contributed to an increase in the calculated peak clad temperature when using the IAC model.

On the other hand, for plants analyzed for which the downcomer was not full at the time the accumulators emptied, a benefit was obtained by increasing the accumulator water level resulting from the higher elevation head and reflooding rates associated with increased downcomer water levels.

Our evaluation of operating two and three-loop plants (Prairie Island Units 1 and 2 are two loop plants) shows a reduction in the calculated peak clad temperature for the IAC analysis, indicating that the IAC Technical Specification limits for accumulator water volume should be increased to the higher proposed Appendix K ECCS analysis values. This was due to the fact that for the cases in which the downcomer water level was less than 13 feet, or is the case with Prairie Island Units 1 and 2, the benefit due to increased downcomer water level (increased reflood rate) was greater than the penalties resulting from delayed refill/reflood and extended cold leg plugging.

(C)

We have concluded that the licensees proposed change to increase the normal range of stored borated water volume from 1200 ft^3-1232 ft^3 to 1250 ft^3-1282 ft^3 is acceptable.
will satisfy both the IAC and the AC and

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the change 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 change 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.~~

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(A)

During the course of review of the submittals by various licensees of new ECCS performance evaluations in accordance with 10 CFR 50.46, ~~in the fall~~ ~~door~~ in the fall of 1974, it was noted by the staff that there were inconsistencies between the technical specifications specifications for compliance with the Commission's prior Interim Acceptance Criteria (IAC) and those proposed for compliance with the Acceptance Criteria of 10 CFR 50.46 ~~(Part A)~~ and Appendix K ~~(Part B)~~. Since compliance with both sets of specifications was required by 10 CFR 50.46, the staff ~~[illegible]~~

(B) 2

Although the water levels used for the licensee's Appendix K evaluations were higher than those previously used for IAC evaluations, and 10CFR 50.46 AC limits are more restrictive than the IAC criteria, the staff review indicates that the AC evaluations did not wholly conform to the Commission evaluation model requirements in Appendix K. The Commission Order of December 27, 1974 composed further restrictions on licensing operation. Since the evaluations were not wholly in conformity with the Commission regulations, it could not be properly assumed that the water level used for the AC evaluations was the appropriate level and would assure compliance with

both the IAC and the 10 CFR 50.46 criteria. The effect of water level on calculational results of the models was assessed, and the staff determined that the higher levels were appropriate to assure compliance with both sets of criteria as required by 10 CFR 50.46 and the Commission's Order of Oct. 2, 1974. Applicant was informed of this on Oct. 2, 1974.

~~and [illegible] that the [illegible] is [illegible]~~

The enclosed amendment simply clarifies the apparent inconsistency between the level specified in the previously approved Technical Specifications based on the IAC, and the requirement of 10 CFR 50.46 that the ~~[illegible]~~ facility ~~AC and also the IAC~~ ~~be~~ comply with the AC as well as the IAC.

B3

To assure that the higher water levels associated with the AC evaluation did not adversely affect the results of the approved IAC evaluations, ~~we assessed the effect of the higher water levels on the IAC~~ we assessed this effect of the higher water levels on the IAC evaluation.

For

Consequently the higher water levels would not adversely affect ~~conformat~~ ~~the calculated~~ peak clad temperature ~~the~~ calculated using the ID C.

The peak clad temperature using the ~~B~~ 10 CFR 50.46 ~~A~~ acceptance criteria models already were based upon the higher accumulator water volume, and with the additional restrictions imposed by the Commission December 27, 1974 Order would assure conformance with the ~~[illegible]~~ acceptance criteria of 10 CFR 50.46 (b).

~~Consequently~~