

February 10, 1997

Mr. Roger O. Anderson, Director
Licensing and Management Issues
Northern States Power Company
414 Nicollet Mall
Minneapolis, Minnesota 55401

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT NOS. 1 AND 2 -
ISSUANCE OF AMENDMENTS RE: CONTAINMENT COOLING SYSTEMS
(TAC NOS. M96492 AND M96493)

Dear Mr. Anderson:

The Commission has issued the enclosed Amendment No. 125 to Facility Operating License No. DPR-42 and Amendment No. 117 to Facility Operating License No. DPR-60 for the Prairie Island Nuclear Generating Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications in response to your application dated August 15, 1996.

The amendments revise the containment cooling systems limiting conditions for operation technical specifications to bring them into conformance with recently completed system analyses by no longer permitting both containment spray pumps to be inoperable at the same time.

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

Sincerely,

Orig. signed by B. Wetzel
Beth A. Wetzel, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-282 and 50-306

Enclosures: 1. Amendment No. 125 to DPR-42
2. Amendment No. 117 to DPR-60
3. Safety Evaluation

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DATED: February 10, 1997

AMENDMENT NO. 125 TO FACILITY OPERATING LICENSE NO. DPR-42-PRAIRIE ISLAND UNIT 1
AMENDMENT NO. 117 TO FACILITY OPERATING LICENSE NO. DPR-60-PRAIRIE ISLAND UNIT 2

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 10, 1997

Mr. Roger O. Anderson, Director
Licensing and Management Issues
Northern States Power Company
414 Nicollet Mall
Minneapolis, Minnesota 55401

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT NOS. 1 AND 2 -
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The amendments revise the containment cooling systems limiting conditions for operation technical specifications to bring them into conformance with recently completed system analyses by no longer permitting both containment spray pumps to be inoperable at the same time.

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

Sincerely,

A handwritten signature in cursive script that reads "Beth A. Wetzel".

Beth A. Wetzel, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-282 and 50-306

Enclosures: 1. Amendment No. 125 to DPR-42
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3. Safety Evaluation

cc w/encl: See next page

Mr. Roger O. Anderson, Director
Northern States Power Company

Prairie Island Nuclear Generating
Plant

cc:

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Prairie Island Nuclear Generating
Plant
Northern States Power Company
1717 Wakonade Drive East
Welch, Minnesota 55089

November 1996



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-282

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 125
License No. DPR-42

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Northern States Power Company (the licensee) dated August 15, 1996, 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-42 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 125, 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 issuance, with full implementation within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Beth A. Wetzel, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: February 10, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 125

FACILITY OPERATING LICENSE NO. DPR-42

DOCKET NO. 50-282

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

REMOVE

TS 3.3-4
B 3.3-3

INSERT

TS 3.3-4
B 3.3-3

3.3.B. Containment Cooling Systems

1. A reactor shall not be made or maintained critical nor shall reactor coolant system average temperature exceed 200°F unless the following conditions are satisfied (except as specified in 3.3.B.2 below):
 - a. Two containment spray pumps are OPERABLE.
 - b. Four containment fan cooler units are OPERABLE.
 - c. The spray additive tank is OPERABLE with not less than 2590 gallons of solution with a sodium hydroxide concentration of 9% to 11% by weight inclusive.
 - d. Manual valves in the above systems that could (if improperly positioned) reduce spray flow below that assumed for accident analysis, shall be blocked and tagged in the proper position. During POWER OPERATION, changes in valve position will be under direct administrative control.
 - e. The containment spray system motor operated valves MV-32096 and MV-32097 (Unit 2 valves: MV-32108 and MV-32109) shall be closed and shall have the motor control center supply breakers in the off position.
2. During STARTUP OPERATION or POWER OPERATION, any one of the following conditions of inoperability may exist provided STARTUP OPERATION is discontinued until OPERABILITY is restored. If OPERABILITY is not restored within the time specified, be in at least HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
 - a. One containment fan cooler train may be inoperable for 7 days.
 - b. One containment spray train may be inoperable for 72 hours.
 - c. The spray additive tank may be inoperable for 24 hours.

3.3 ENGINEERED SAFETY FEATURES

Bases continued

The containment cooling function is provided by two independent systems: containment fan cooler (CFC) and containment spray. The CFC system consists of two separate trains with each train consisting of two fan coil units. The containment spray system consists of two independent trains, except that each train is supplied sodium hydroxide from a single, common spray additive tank. During normal operation, two CFC trains are utilized to remove heat lost from equipment and piping within the containment. In the event of the Design Basis Accident, one containment fan cooler unit plus one containment spray pump will provide sufficient cooling to reduce containment pressure and maintain off-site and control room doses within regulatory limits (Reference 4). One CFC train is permitted to be inoperable during POWER OPERATION. This is an abnormal operating situation, in that plant operating procedures require that inoperable CFC units be repaired as soon as practical. However, because of the difficulty of access to make repairs, it is important on occasion to be able to operate temporarily with only one CFC train. One CFC train can provide adequate cooling for normal operation when the CFC units are cooled by the chilled water system (Reference 3). Compensation for this mode of operation is provided by the high degree of redundancy of containment cooling systems during a Design Basis Accident.

One component cooling water pump together with one component cooling heat exchanger can accommodate the heat removal load on one unit, either following a loss-of-coolant accident or during normal plant shutdown. The four pumps of the two-unit facility can be cross connected as necessary to accommodate temporary outage of the pump. If, during the post-accident phase, the component cooling water supply were lost, core and containment cooling could be maintained until repairs were effected (Reference 5).

Cooling water can be supplied by either of the two horizontal motor-driven pumps, by a safeguards motor-driven pump or by either of two safeguards diesel-driven pumps. (Reference 6). Operation of a single cooling water pump provides sufficient cooling in one unit during the injection and recirculation phases of a postulated loss-of coolant accident plus sufficient cooling to maintain the second unit in a hot standby condition.

TS.3.3.D.1.a assures that an automatic Safety Injection signal to the cooling water header isolation valves will not align both OPERABLE safeguards pumps to the same safeguards train.

TS.3.3.D.1.a also assures that 121 cooling water pump is aligned to provide cooling water to the same train as the train from which it is being powered (e.g., if 121 cooling water pump is aligned to Train B cooling water header, it needs to be powered from Bus 26 and, ultimately, Diesel Generator D6 in the event of a loss of offsite power). Otherwise, the single failure of a diesel generator could leave one train of engineered safety features without power and the other train without cooling water.

The minimum fuel supply of 19,000 gallons will supply one diesel-driven cooling water pump for 14 days. Note that the 19,000 gallon requirement is included in the 70,000 gallon total diesel fuel oil requirement of Specification 3.7.A.5 for Unit 1.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-306

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 117
License No. DPR-60

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Northern States Power Company (the licensee) dated August 15, 1996, 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-60 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 117, 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 issuance, with full implementation within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Beth A. Wetzel, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: February 10, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 117

FACILITY OPERATING LICENSE NO. DPR-60

DOCKET NO. 50-306

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

REMOVE

TS 3.3-4
B 3.3-3

INSERT

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B 3.3-3

3.3.B. Containment Cooling Systems

1. A reactor shall not be made or maintained critical nor shall reactor coolant system average temperature exceed 200°F unless the following conditions are satisfied (except as specified in 3.3.B.2 below):
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 - b. Four containment fan cooler units are OPERABLE.
 - c. The spray additive tank is OPERABLE with not less than 2590 gallons of solution with a sodium hydroxide concentration of 9% to 11% by weight inclusive.
 - d. Manual valves in the above systems that could (if improperly positioned) reduce spray flow below that assumed for accident analysis, shall be blocked and tagged in the proper position. During POWER OPERATION, changes in valve position will be under direct administrative control.
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3.3 ENGINEERED SAFETY FEATURES

Bases continued

The containment cooling function is provided by two independent systems: containment fan cooler (CFC) and containment spray. The CFC system consists of two separate trains with each train consisting of two fan coil units. The containment spray system consists of two independent trains, except that each train is supplied sodium hydroxide from a single, common spray additive tank. During normal operation, two CFC trains are utilized to remove heat lost from equipment and piping within the containment. In the event of the Design Basis Accident, one containment fan cooler unit plus one containment spray pump will provide sufficient cooling to reduce containment pressure and maintain off-site and control room doses within regulatory limits (Reference 4). One CFC train is permitted to be inoperable during POWER OPERATION. This is an abnormal operating situation, in that plant operating procedures require that inoperable CFC units be repaired as soon as practical. However, because of the difficulty of access to make repairs, it is important on occasion to be able to operate temporarily with only one CFC train. One CFC train can provide adequate cooling for normal operation when the CFC units are cooled by the chilled water system (Reference 3). Compensation for this mode of operation is provided by the high degree of redundancy of containment cooling systems during a Design Basis Accident.

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Cooling water can be supplied by either of the two horizontal motor-driven pumps, by a safeguards motor-driven pump or by either of two safeguards diesel-driven pumps. (Reference 6). Operation of a single cooling water pump provides sufficient cooling in one unit during the injection and recirculation phases of a postulated loss-of coolant accident plus sufficient cooling to maintain the second unit in a hot standby condition.

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 125 AND 117 TO

FACILITY OPERATING 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

1.0 INTRODUCTION

By letter dated August 15, 1996, the Northern States Power Company (NSP or the licensee) requested amendments to the Technical Specifications (TS) appended to Facility Operating License Nos. DPR-42 and DPR-60 for the Prairie Island Nuclear Generating Plant, Unit Nos. 1 and 2. The proposed amendments would revise TS 3.3.B.2. TS 3.3.B.2 specifies operability requirements for operation of the containment cooling systems.

2.0 DISCUSSION AND EVALUATION

2.1 Original Licensing Basis for Prairie Island Containment Cooling Systems

The containment cooling systems for each unit include two diverse methods of post-accident containment cooling: the containment spray system and the containment fan cooler system. These systems are engineered safety features whose safety functions are to cool the post-accident internal containment atmosphere. Each system consists of two independent, redundant trains. Each of the two trains of the containment spray system is provided with a pump that discharges to containment spray nozzles. Each of the two trains of the fan cooler system has two fan coil units that transfer heat in the containment atmosphere to cooling water circulating through the fan cooler coils. The containment fan cooler system is used during normal operation in addition to providing a post-accident safety function. The two trains of the containment spray system are provided with a common (i.e., shared) sodium hydroxide-filled spray additive tank that enables the containment spray system to serve the additional safety function of pH reduction. The pH control function promotes containment atmosphere iodine removal to minimize offsite and control room radiological dose consequences due to containment leakage (offsite dose, but not control room dose criteria can be met without credit for the spray system iodine fission product removal safety function).

During normal plant operation, fan coil units are supplied with chilled water supply to cool the containment. Under accident conditions, the cooling water supply is switched to the safety-grade, shared cooling water system which also

provides cooling water to the residual heat removal (RHR) emergency core cooling system (ECCS) heat exchanger. The containment spray system water supply is from the RWST [refueling water storage tank] prior to recirculation switchover, and, following switchover (if operated), it is from the ECCS at a point downstream of the RHR heat exchanger. (As a result of Information Notice 87-63, "Inadequate Net Positive Suction Head in Low Pressure Safety Systems," RHR pump runout studies, EOPs [emergency operating procedures] were revised in 1988 to prohibit spray pump operation after switchover.)

As originally designed, in the event of a design-basis accident, any one of the following combinations of containment cooling systems trains would provide sufficient containment cooling:

Both trains of the containment fan cooler system (i.e., four fan coolers), or

Both trains of the containment spray system, or

One train of the containment spray system and one train of the containment fan cooler system.

These combinations meet General Design Criteria 41 and 52 and provide the basis for the current TS 3.3.B.2.

2.2 Findings of Licensee's Reanalysis

In 1995, the licensee developed an analytical model of the cooling water system to better understand and evaluate its capabilities. The licensee subsequently found that under post-accident conditions, system pressure would be so low that boiling could occur in the Unit 1 upper level fan coolers. The licensee then performed containment pressure analyses using the CONTEMPT code to evaluate the effect.

The licensee found that, for a loss-of-coolant accident (LOCA), the design-basis requirements for containment pressure response could be met with one spray train and one fan cooler during injection and one fan cooler during recirculation (spray secured during recirculation), but could not be met with four fan coolers and no spray.

The licensee found that for a main steam line break (MSLB), design-basis pressure response criteria were met with one spray train. (Due to the higher containment temperatures associated with an MSLB, the licensee's analysis conservatively assumes that all four fan coil units are unavailable for that event.)

New radiological analyses also confirmed that containment spray is not needed for offsite dose mitigation, but is needed (for at least 45 minutes) for LOCA control room dose mitigation.

In view of the above findings, the current TS 3.3.B.2 does not ensure adequate containment cooling and fission product control for all postulated design-basis accidents when equipment is operating under certain permitted operating conditions.

2.3 Proposed TS Changes

The TS would be such that the allowed completion times to restore inoperable equipment would reflect the results of the new analyses. The completion times would not be dependent on the operability status of the fan cooler system. Similarly, the completion times for inoperable containment fan cooler units would not be dependent on the operability status of the containment spray system. The completion times for inoperable fan cooler units would be deleted and replaced by completion times for inoperable fan cooler trains. Under the proposed TS, one train (two units) of containment fan cooling would be allowed to be out of service for up to 7 days. One train of spray would be allowed to be out of service for 72 hours. The spray additive tank would be allowed out of service for up to 24 hours.

The staff has established standard generic criteria for completion times in the event required equipment is inoperable. These criteria are:

7 days of continued operation is permitted while in a degraded condition if an additional single failure (including loss of an AC power subdivision) could be tolerated.

72 hours of continued operation is permitted if the operable containment cooling systems are sufficient.

Commence a shutdown if a safety function is completely lost.

The 7-day completion time for an inoperable train of fan cooling is based on the redundant heat removal capabilities afforded by combinations of the containment spray system and containment fan cooler system and low probability of a design-basis accident occurring during this period. The 72-hour completion time for an inoperable spray train is based on the redundant heat removal capabilities afforded by the containment spray system and containment fan cooler trains, reasonable time for repairs, and low probability of a design-basis accident occurring during this period. These changes have been proposed to conform the TS to the results of recent Prairie Island containment cooling analyses. The proposed containment cooling systems completion times are consistent with the staff criteria. They are also consistent with NUREG-1431, Standard Technical Specifications, Westinghouse Plants.

Because the findings by the licensee indicate that the containment spray system will not adequately mitigate a design-basis accident if no pH adjustment is provided and because a common spray additive tank supplies both containment spray trains, 72 hours allowed outage time is judged by the

licensee to be excessive. Lack of spray additive during a design-basis LOCA would result in partial loss of the spray systems' iodine removal safety function (but no loss of containment heat removal capability). A 24-hour completion time has been conservatively selected to reflect the importance of the iodine removal safety function for control room dose control and the fact that it is a highly reliable (essentially passive) system that can be quickly restored if found inoperable. Based on these factors, the proposed 24-hour allowed outage time for the spray additive tank is acceptable. Also, the staff finds it acceptable that the interdependencies of the fan cooler units and the containment spray pumps have been eliminated, allowing one train of containment fan cooler units to be inoperable for 7 days and one containment spray train to be inoperable for 72 hours. The staff also agrees with the licensee's assessment that at least one containment spray pump should be required to be operable and, therefore, the deletion of the technical specification allowing one pump to be inoperable is acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Minnesota State official was notified of the proposed issuance of the amendments. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve 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 the amendments involve no significant hazards consideration and there has been no public comment on such finding (61 FR 64388). Accordingly, the amendments meet 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 the amendments.

5.0 CONCLUSION

The Commission 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public. Therefore, the staff concludes that the proposed changes are acceptable.

Principal Contributor: W. Long

Date: February 10, 1997

February 10, 1997

Mr. Roger O. Anderson, Director
Licensing and Management Issues
Northern States Power Company
414 Nicollet Mall
Minneapolis, Minnesota 55401

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT NOS. 1 AND 2 -
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Sincerely,

Orig. signed by B. Wetzel
Beth A. Wetzel, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
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AMENDMENT NO. 125 TO FACILITY OPERATING LICENSE NO. DPR-42-PRAIRIE ISLAND UNIT 1
AMENDMENT NO. 117 TO FACILITY OPERATING LICENSE NO. DPR-60-PRAIRIE ISLAND UNIT 2

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 10, 1997

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Northern States Power Company
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Dear Mr. Anderson:

The Commission has issued the enclosed Amendment No. 125 to Facility Operating License No. DPR-42 and Amendment No. 117 to Facility Operating License No. DPR-60 for the Prairie Island Nuclear Generating Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications in response to your application dated August 15, 1996.

The amendments revise the containment cooling systems limiting conditions for operation technical specifications to bring them into conformance with recently completed system analyses by no longer permitting both containment spray pumps to be inoperable at the same time.

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

Sincerely,

A handwritten signature in cursive script that reads "Beth A. Wetzel".

Beth A. Wetzel, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-282 and 50-306

Enclosures: 1. Amendment No. 125 to DPR-42
2. Amendment No. 117 to DPR-60
3. Safety Evaluation

cc w/encl: See next page

Mr. Roger O. Anderson, Director
Northern States Power Company

Prairie Island Nuclear Generating
Plant

cc:

J. E. Silberg, Esquire
Shaw, Pittman, Potts and Trowbridge
2300 N Street, N. W.
Washington DC 20037

Tribal Council
Prairie Island Indian Community
ATTN: Environmental Department
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Welch, Minnesota 55089

Plant Manager
Prairie Island Nuclear Generating
Plant
Northern States Power Company
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121 Seventh Place East
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Site Licensing
Prairie Island Nuclear Generating
Plant
Northern States Power Company
1717 Wakonade Drive East
Welch, Minnesota 55089

November 1996



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-282

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 125
License No. DPR-42

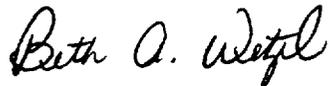
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Northern States Power Company (the licensee) dated August 15, 1996, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules 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-42 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 125, 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 issuance, with full implementation within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Beth A. Wetzel, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: February 10, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 125

FACILITY OPERATING LICENSE NO. DPR-42

DOCKET NO. 50-282

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

REMOVE

TS 3.3-4
B 3.3-3

INSERT

TS 3.3-4
B 3.3-3

3.3.B. Containment Cooling Systems

1. A reactor shall not be made or maintained critical nor shall reactor coolant system average temperature exceed 200°F unless the following conditions are satisfied (except as specified in 3.3.B.2 below):
 - a. Two containment spray pumps are OPERABLE.
 - b. Four containment fan cooler units are OPERABLE.
 - c. The spray additive tank is OPERABLE with not less than 2590 gallons of solution with a sodium hydroxide concentration of 9% to 11% by weight inclusive.
 - d. Manual valves in the above systems that could (if improperly positioned) reduce spray flow below that assumed for accident analysis, shall be blocked and tagged in the proper position. During POWER OPERATION, changes in valve position will be under direct administrative control.
 - e. The containment spray system motor operated valves MV-32096 and MV-32097 (Unit 2 valves: MV-32108 and MV-32109) shall be closed and shall have the motor control center supply breakers in the off position.
2. During STARTUP OPERATION or POWER OPERATION, any one of the following conditions of inoperability may exist provided STARTUP OPERATION is discontinued until OPERABILITY is restored. If OPERABILITY is not restored within the time specified, be in at least HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
 - a. One containment fan cooler train may be inoperable for 7 days.
 - b. One containment spray train may be inoperable for 72 hours.
 - c. The spray additive tank may be inoperable for 24 hours.

3.3 ENGINEERED SAFETY FEATURES

Bases continued

The containment cooling function is provided by two independent systems: containment fan cooler (CFC) and containment spray. The CFC system consists of two separate trains with each train consisting of two fan coil units. The containment spray system consists of two independent trains, except that each train is supplied sodium hydroxide from a single, common spray additive tank. During normal operation, two CFC trains are utilized to remove heat lost from equipment and piping within the containment. In the event of the Design Basis Accident, one containment fan cooler unit plus one containment spray pump will provide sufficient cooling to reduce containment pressure and maintain off-site and control room doses within regulatory limits (Reference 4). One CFC train is permitted to be inoperable during POWER OPERATION. This is an abnormal operating situation, in that plant operating procedures require that inoperable CFC units be repaired as soon as practical. However, because of the difficulty of access to make repairs, it is important on occasion to be able to operate temporarily with only one CFC train. One CFC train can provide adequate cooling for normal operation when the CFC units are cooled by the chilled water system (Reference 3). Compensation for this mode of operation is provided by the high degree of redundancy of containment cooling systems during a Design Basis Accident.

One component cooling water pump together with one component cooling heat exchanger can accommodate the heat removal load on one unit, either following a loss-of-coolant accident or during normal plant shutdown. The four pumps of the two-unit facility can be cross connected as necessary to accommodate temporary outage of the pump. If, during the post-accident phase, the component cooling water supply were lost, core and containment cooling could be maintained until repairs were effected (Reference 5).

Cooling water can be supplied by either of the two horizontal motor-driven pumps, by a safeguards motor-driven pump or by either of two safeguards diesel-driven pumps. (Reference 6). Operation of a single cooling water pump provides sufficient cooling in one unit during the injection and recirculation phases of a postulated loss-of coolant accident plus sufficient cooling to maintain the second unit in a hot standby condition.

TS.3.3.D.1.a assures that an automatic Safety Injection signal to the cooling water header isolation valves will not align both OPERABLE safeguards pumps to the same safeguards train.

TS.3.3.D.1.a also assures that 121 cooling water pump is aligned to provide cooling water to the same train as the train from which it is being powered (e.g., if 121 cooling water pump is aligned to Train B cooling water header, it needs to be powered from Bus 26 and, ultimately, Diesel Generator D6 in the event of a loss of offsite power). Otherwise, the single failure of a diesel generator could leave one train of engineered safety features without power and the other train without cooling water.

The minimum fuel supply of 19,000 gallons will supply one diesel-driven cooling water pump for 14 days. Note that the 19,000 gallon requirement is included in the 70,000 gallon total diesel fuel oil requirement of Specification 3.7.A.5 for Unit 1.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-306

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 117
License No. DPR-60

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Northern States Power Company (the licensee) dated August 15, 1996, 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-60 is hereby amended to read as follows:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 117, 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 issuance, with full implementation within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Beth A. Wetzel, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: February 10, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 117

FACILITY OPERATING LICENSE NO. DPR-60

DOCKET NO. 50-306

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

REMOVE

TS 3.3-4
B 3.3-3

INSERT

TS 3.3-4
B 3.3-3

3.3.B. Containment Cooling Systems

1. A reactor shall not be made or maintained critical nor shall reactor coolant system average temperature exceed 200°F unless the following conditions are satisfied (except as specified in 3.3.B.2 below):
 - a. Two containment spray pumps are OPERABLE.
 - b. Four containment fan cooler units are OPERABLE.
 - c. The spray additive tank is OPERABLE with not less than 2590 gallons of solution with a sodium hydroxide concentration of 9% to 11% by weight inclusive.
 - d. Manual valves in the above systems that could (if improperly positioned) reduce spray flow below that assumed for accident analysis, shall be blocked and tagged in the proper position. During POWER OPERATION, changes in valve position will be under direct administrative control.
 - e. The containment spray system motor operated valves MV-32096 and MV-32097 (Unit 2 valves: MV-32108 and MV-32109) shall be closed and shall have the motor control center supply breakers in the off position.
2. During STARTUP OPERATION or POWER OPERATION, any one of the following conditions of inoperability may exist provided STARTUP OPERATION is discontinued until OPERABILITY is restored. If OPERABILITY is not restored within the time specified, be in at least HOT SHUTDOWN within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
 - a. One containment fan cooler train may be inoperable for 7 days.
 - b. One containment spray train may be inoperable for 72 hours.
 - c. The spray additive tank may be inoperable for 24 hours.

3.3 ENGINEERED SAFETY FEATURESBases continued

The containment cooling function is provided by two independent systems: containment fan cooler (CFC) and containment spray. The CFC system consists of two separate trains with each train consisting of two fan coil units. The containment spray system consists of two independent trains, except that each train is supplied sodium hydroxide from a single, common spray additive tank. During normal operation, two CFC trains are utilized to remove heat lost from equipment and piping within the containment. In the event of the Design Basis Accident, one containment fan cooler unit plus one containment spray pump will provide sufficient cooling to reduce containment pressure and maintain off-site and control room doses within regulatory limits (Reference 4). One CFC train is permitted to be inoperable during POWER OPERATION. This is an abnormal operating situation, in that plant operating procedures require that inoperable CFC units be repaired as soon as practical. However, because of the difficulty of access to make repairs, it is important on occasion to be able to operate temporarily with only one CFC train. One CFC train can provide adequate cooling for normal operation when the CFC units are cooled by the chilled water system (Reference 3). Compensation for this mode of operation is provided by the high degree of redundancy of containment cooling systems during a Design Basis Accident.

One component cooling water pump together with one component cooling heat exchanger can accommodate the heat removal load on one unit, either following a loss-of-coolant accident or during normal plant shutdown. The four pumps of the two-unit facility can be cross connected as necessary to accommodate temporary outage of the pump. If, during the post-accident phase, the component cooling water supply were lost, core and containment cooling could be maintained until repairs were effected (Reference 5).

Cooling water can be supplied by either of the two horizontal motor-driven pumps, by a safeguards motor-driven pump or by either of two safeguards diesel-driven pumps. (Reference 6). Operation of a single cooling water pump provides sufficient cooling in one unit during the injection and recirculation phases of a postulated loss-of coolant accident plus sufficient cooling to maintain the second unit in a hot standby condition.

TS.3.3.D.1.a assures that an automatic Safety Injection signal to the cooling water header isolation valves will not align both OPERABLE safeguards pumps to the same safeguards train.

TS.3.3.D.1.a also assures that 121 cooling water pump is aligned to provide cooling water to the same train as the train from which it is being powered (e.g., if 121 cooling water pump is aligned to Train B cooling water header, it needs to be powered from Bus 26 and, ultimately, Diesel Generator D6 in the event of a loss of offsite power). Otherwise, the single failure of a diesel generator could leave one train of engineered safety features without power and the other train without cooling water.

The minimum fuel supply of 19,000 gallons will supply one diesel-driven cooling water pump for 14 days. Note that the 19,000 gallon requirement is included in the 70,000 gallon total diesel fuel oil requirement of Specification 3.7.A.5 for Unit 1.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 125 AND 117 TO

FACILITY OPERATING 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

1.0 INTRODUCTION

By letter dated August 15, 1996, the Northern States Power Company (NSP or the licensee) requested amendments to the Technical Specifications (TS) appended to Facility Operating License Nos. DPR-42 and DPR-60 for the Prairie Island Nuclear Generating Plant, Unit Nos. 1 and 2. The proposed amendments would revise TS 3.3.B.2. TS 3.3.B.2 specifies operability requirements for operation of the containment cooling systems.

2.0 DISCUSSION AND EVALUATION

2.1 Original Licensing Basis for Prairie Island Containment Cooling Systems

The containment cooling systems for each unit include two diverse methods of post-accident containment cooling: the containment spray system and the containment fan cooler system. These systems are engineered safety features whose safety functions are to cool the post-accident internal containment atmosphere. Each system consists of two independent, redundant trains. Each of the two trains of the containment spray system is provided with a pump that discharges to containment spray nozzles. Each of the two trains of the fan cooler system has two fan coil units that transfer heat in the containment atmosphere to cooling water circulating through the fan cooler coils. The containment fan cooler system is used during normal operation in addition to providing a post-accident safety function. The two trains of the containment spray system are provided with a common (i.e., shared) sodium hydroxide-filled spray additive tank that enables the containment spray system to serve the additional safety function of pH reduction. The pH control function promotes containment atmosphere iodine removal to minimize offsite and control room radiological dose consequences due to containment leakage (offsite dose, but not control room dose criteria can be met without credit for the spray system iodine fission product removal safety function).

During normal plant operation, fan coil units are supplied with chilled water supply to cool the containment. Under accident conditions, the cooling water supply is switched to the safety-grade, shared cooling water system which also

provides cooling water to the residual heat removal (RHR) emergency core cooling system (ECCS) heat exchanger. The containment spray system water supply is from the RWST [refueling water storage tank] prior to recirculation switchover, and, following switchover (if operated), it is from the ECCS at a point downstream of the RHR heat exchanger. (As a result of Information Notice 87-63, "Inadequate Net Positive Suction Head in Low Pressure Safety Systems," RHR pump runout studies, EOPs [emergency operating procedures] were revised in 1988 to prohibit spray pump operation after switchover.)

As originally designed, in the event of a design-basis accident, any one of the following combinations of containment cooling systems trains would provide sufficient containment cooling:

Both trains of the containment fan cooler system (i.e., four fan coolers), or

Both trains of the containment spray system, or

One train of the containment spray system and one train of the containment fan cooler system.

These combinations meet General Design Criteria 41 and 52 and provide the basis for the current TS 3.3.B.2.

2.2 Findings of Licensee's Reanalysis

In 1995, the licensee developed an analytical model of the cooling water system to better understand and evaluate its capabilities. The licensee subsequently found that under post-accident conditions, system pressure would be so low that boiling could occur in the Unit 1 upper level fan coolers. The licensee then performed containment pressure analyses using the CONTEMPT code to evaluate the effect.

The licensee found that, for a loss-of-coolant accident (LOCA), the design-basis requirements for containment pressure response could be met with one spray train and one fan cooler during injection and one fan cooler during recirculation (spray secured during recirculation), but could not be met with four fan coolers and no spray.

The licensee found that for a main steam line break (MSLB), design-basis pressure response criteria were met with one spray train. (Due to the higher containment temperatures associated with an MSLB, the licensee's analysis conservatively assumes that all four fan coil units are unavailable for that event.)

New radiological analyses also confirmed that containment spray is not needed for offsite dose mitigation, but is needed (for at least 45 minutes) for LOCA control room dose mitigation.

In view of the above findings, the current TS 3.3.B.2 does not ensure adequate containment cooling and fission product control for all postulated design-basis accidents when equipment is operating under certain permitted operating conditions.

2.3 Proposed TS Changes

The TS would be such that the allowed completion times to restore inoperable equipment would reflect the results of the new analyses. The completion times would not be dependent on the operability status of the fan cooler system. Similarly, the completion times for inoperable containment fan cooler units would not be dependent on the operability status of the containment spray system. The completion times for inoperable fan cooler units would be deleted and replaced by completion times for inoperable fan cooler trains. Under the proposed TS, one train (two units) of containment fan cooling would be allowed to be out of service for up to 7 days. One train of spray would be allowed to be out of service for 72 hours. The spray additive tank would be allowed out of service for up to 24 hours.

The staff has established standard generic criteria for completion times in the event required equipment is inoperable. These criteria are:

7 days of continued operation is permitted while in a degraded condition if an additional single failure (including loss of an AC power subdivision) could be tolerated.

72 hours of continued operation is permitted if the operable containment cooling systems are sufficient.

Commence a shutdown if a safety function is completely lost.

The 7-day completion time for an inoperable train of fan cooling is based on the redundant heat removal capabilities afforded by combinations of the containment spray system and containment fan cooler system and low probability of a design-basis accident occurring during this period. The 72-hour completion time for an inoperable spray train is based on the redundant heat removal capabilities afforded by the containment spray system and containment fan cooler trains, reasonable time for repairs, and low probability of a design-basis accident occurring during this period. These changes have been proposed to conform the TS to the results of recent Prairie Island containment cooling analyses. The proposed containment cooling systems completion times are consistent with the staff criteria. They are also consistent with NUREG-1431, Standard Technical Specifications, Westinghouse Plants.

Because the findings by the licensee indicate that the containment spray system will not adequately mitigate a design-basis accident if no pH adjustment is provided and because a common spray additive tank supplies both containment spray trains, 72 hours allowed outage time is judged by the

licensee to be excessive. Lack of spray additive during a design-basis LOCA would result in partial loss of the spray systems' iodine removal safety function (but no loss of containment heat removal capability). A 24-hour completion time has been conservatively selected to reflect the importance of the iodine removal safety function for control room dose control and the fact that it is a highly reliable (essentially passive) system that can be quickly restored if found inoperable. Based on these factors, the proposed 24-hour allowed outage time for the spray additive tank is acceptable. Also, the staff finds it acceptable that the interdependencies of the fan cooler units and the containment spray pumps have been eliminated, allowing one train of containment fan cooler units to be inoperable for 7 days and one containment spray train to be inoperable for 72 hours. The staff also agrees with the licensee's assessment that at least one containment spray pump should be required to be operable and, therefore, the deletion of the technical specification allowing one pump to be inoperable is acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Minnesota State official was notified of the proposed issuance of the amendments. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve 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 the amendments involve no significant hazards consideration and there has been no public comment on such finding (61 FR 64388). Accordingly, the amendments meet 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 the amendments.

5.0 CONCLUSION

The Commission 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public. Therefore, the staff concludes that the proposed changes are acceptable.

Principal Contributor: W. Long

Date: February 10, 1997