



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

February 5, 2021

Mr. Christopher P. Domingos
Site Vice President
Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota
1717 Wakonade Drive East
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND
2 - ISSUANCE OF AMENDMENT NOS. 234 AND 222 RE: ISSUES IDENTIFIED
IN WESTINGHOUSE NUCLEAR SAFETY ADVISORY LETTERS NSAL-09-05,
REVISION 1, AND NSAL-15-1 (EPID L-2020-LLA-0014)

Dear Mr. Domingos:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 234 to Renewed Facility Operating License No. DPR-42 and Amendment No. 222 to Renewed Facility Operating License No. DPR-60 for the Prairie Island Nuclear Generating Plant, Units 1 and 2 (Prairie Island), respectively. The amendments consist of changes to the technical specifications (TSs) in response to your application dated January 29, 2020.

The amendments modify TS requirements to address issues identified in Westinghouse Nuclear Safety Advisory Letter (NSAL) NSAL-09-05, Revision 1, "Relaxed Axial Offset Control F_Q Technical Specification Actions," and NSAL-15-1, "Heat Flux Hot Channel Factor Technical Specification Surveillance."

A copy of our related safety evaluation is also enclosed. The Notice of Issuance will be included in the Commission's monthly *Federal Register* notice.

Sincerely,

/RA/

Robert F. Kuntz, Senior Project Manager
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-282 and 50-306

Enclosures:

1. Amendment No. 234 to DPR-42
2. Amendment No. 222 to DPR-60
3. Safety Evaluation

cc: Listserv



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

NORTHERN STATES POWER COMPANY - MINNESOTA

DOCKET NO. 50-282

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 234
Renewed License No. DPR-42

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Northern States Power Company, a Minnesota Corporation (NSPM, the licensee), dated January 29, 2020, 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 Renewed Facility Operating License No. DPR-42 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 234, are hereby incorporated in the renewed operating license. NSPM shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented prior to starting up from the next refueling outage for each unit concurrent with the core operating limits report update associated with the core reload for each unit.

FOR THE NUCLEAR REGULATORY COMMISSION

Nancy L. Salgado, Chief (J. Wiebe for)
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License and Technical
Specifications

Date of Issuance: February 5, 2021



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

NORTHERN STATES POWER COMPANY - MINNESOTA

DOCKET NO. 50-306

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 222
Renewed License No. DPR-60

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Northern States Power Company, a Minnesota Corporation (NSPM, the licensee), dated January 29, 2020, 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 Renewed Facility Operating License No. DPR-60 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 222, are hereby incorporated in the renewed operating license. NSPM shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented prior to starting up from the next refueling outage for each unit concurrent with the core operating limits report update associated with the core reload for each unit.

FOR THE NUCLEAR REGULATORY COMMISSION

Nancy L. Salgado, Chief (J. Wiebe for)
Plant Licensing Branch III
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License and Technical
Specifications

Date of Issuance: February 5, 2021

ATTACHMENT TO LICENSE AMENDMENT NOS. 234 AND 222

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

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

DOCKET NOS. 50-282 AND 50-306

Replace the following pages of the Renewed Facility Operating License Nos. DPR-42 and DPR-60 with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicate the areas of change.

Renewed Facility Operating License No. DPR-42

REMOVE

INSERT

Page 3

Page 3

Renewed Facility Operating License No. DPR-60

REMOVE

INSERT

Page 3

Page 3

Technical Specifications

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

INSERT

3.2.1-1

3.2.1-1

3.2.1-2

3.2.1-2

3.2.1-3

3.2.1-3

3.2.1-4

3.2.1-4

3.2.1-5

3.2.1-5

3.2.1-6

3.2.1-6

5.0-37

5.0-37

- (3) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, NSPM to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
 - (4) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, NSPM to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument and equipment calibration or associated with radioactive apparatus or components;
 - (5) Pursuant to the Act and 10 CFR Parts 30 and 70, NSPM to possess but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility;
 - (6) Pursuant to the Act and 10 CFR Parts 30 and 70, NSPM to transfer byproduct materials from other job sites owned by NSPM for the purpose of volume reduction and decontamination.
- C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:
- (1) Maximum Power Level

NSPM is authorized to operate the facility at steady state reactor core power levels not in excess of 1677 megawatts thermal.
 - (2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 234, are hereby incorporated in the renewed operating license. NSPM shall operate the facility in accordance with the Technical Specifications.
 - (3) Physical Protection

NSPM shall fully implement and maintain in effect all provisions of the Commission-approved physical security, guard training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains

- (3) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, NSPM to receive, possess, and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
 - (4) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, NSPM to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument and equipment calibration or associated with radioactive apparatus or components;
 - (5) Pursuant to the Act and 10 CFR Parts 30 and 70, NSPM to possess but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility;
 - (6) Pursuant to the Act and 10 CFR Parts 30 and 70, NSPM to transfer byproduct materials from other job sites owned by NSPM for the purposes of volume reduction and decontamination.
- C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:
- (1) Maximum Power Level

NSPM is authorized to operate the facility at steady state reactor core power levels not in excess of 1677 megawatts thermal.
 - (2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 222, are hereby incorporated in the renewed operating license. NSPM shall operate the facility in accordance with the Technical Specifications.
 - (3) Physical Protection

NSPM shall fully implement and maintain in effect all provisions of the Commission-approved physical security, guard training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains

3.2 POWER DISTRIBUTION LIMITS

3.2.1 Heat Flux Hot Channel Factor (F_q(Z))

LCO 3.2.1 F_q(Z), as approximated by F_q^c(Z) and F_q^w(Z), shall be within the limits specified in the COLR.

APPLICABILITY: MODE 1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. -----NOTE----- Required Action A.4 shall be completed whenever this Condition is entered prior to increasing THERMAL POWER above the limit of Required Action A.1. SR 3.2.1.2 is not required to be performed if this Condition is entered prior to THERMAL POWER exceeding 75% RTP after a refueling. -----</p> <p>F_q^c(Z) not within limit.</p>	<p>A.1 Reduce THERMAL POWER $\geq 1\%$ RTP for each 1% F_q^c(Z) exceeds limit.</p> <p><u>AND</u></p> <p>A.2 Reduce Power Range Neutron Flux -High trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action A.1.</p> <p><u>AND</u></p>	<p>15 minutes after each F_q^c(Z) determination</p> <p>72 hours after each F_q^c(Z) determination</p>

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	<p>A.3 Reduce Overpower ΔT trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action A.1.</p> <p><u>AND</u></p> <p>A.4 Perform SR 3.2.1.1 and SR 3.2.1.2.</p>	<p>72 hours after each F_Q^c(Z) determination</p> <p>Prior to increasing THERMAL POWER above the limit of Required Action A.1</p>

ACTIONS

B. F _Q ^w (Z) not within limits.	<p>B.1.1 Implement a RAOC operating space specified in the COLR that restores F_Q^w(Z) to within its limits.</p> <p><u>AND</u></p> <p>B.1.2 Perform SR 3.2.1.1 and SR 3.2.1.2 if control rod motion is required to comply with the new operating space.</p> <p><u>OR</u></p> <p>B.2.1 -----NOTE----- Required Action B.2.4 shall be completed whenever Required Action B.2.1 is performed prior to increasing THERMAL POWER above the limit of Required Action B.2.1 -----</p> <p>Limit THERMAL POWER to less than RATED THERMAL POWER and reduce AFD limits as specified in the COLR.</p> <p><u>AND</u></p>	<p>4 hours</p> <p>72 hours</p> <p>4 hours</p>
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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	<p>B.2.2 Reduce Power Range Neutron Flux-High trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action B.2.1.</p> <p><u>AND</u></p>	72 hours
	<p>B.2.3 Reduce Overpower ΔT trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action B.2.1.</p> <p><u>AND</u></p>	72 hours
	<p>B.2.4 Perform SR 3.2.1.1 and SR 3.2.1.2.</p>	Prior to increasing THERMAL POWER above the limit of Required Action B.2.1
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 2.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.1.1 Verify $F_Q^c(Z)$ is within limit.	<p>Once after each refueling prior to THERMAL POWER exceeding 75% RTP</p> <p><u>AND</u></p> <p>Once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^c(Z)$ was last verified</p> <p><u>AND</u></p> <p>In accordance with the Surveillance Frequency Control Program</p>

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 Verify F _Q ^w (Z) is within limit.	<p>Once after each refueling within 24 hours after THERMAL POWER exceeds 75% RTP</p> <p><u>AND</u></p> <p>Once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which F_Q^w(Z) was last verified</p> <p><u>AND</u></p> <p>In accordance with the Surveillance Frequency Control Program</p>

5.6 Reporting Requirements

5.6.5 CORE OPERATING LIMITS REPORT (COLR) (continued)

29. Caldon Engineering Report ER-157P, “Supplement to Topical Report ER-80P: Basis for a Power Uprate with the LEFM or LEFM CheckPlus System”;
 30. WCAP-12610-P-A, “VANTAGE+ Fuel Assembly Reference Core Report”;
 31. WCAP-12610-P-A and CENPD-404-P-A, Addendum 1-A, “Optimized ZIRLOTM”;
 32. Commencing Unit 1 Cycle 30 and Unit 2 Cycle 30, this reference shall be used in lieu of reference 23: WCAP-16045-P-A, “Qualification of the Two-Dimensional Transport Code PARAGON”, August 2004;
 33. Commencing Unit 1 Cycle 30 and Unit 2 Cycle 30, this reference shall be used in lieu of reference 23: WCAP-16045-P-A, Addendum 1-A, “Qualification of the NEXUS Nuclear Data Methodology”, August 2007;
 34. WCAP-17661-P-A, “Improved RAOC and CAOC F_Q Surveillance Technical Specifications”, February 2019.
- c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal-mechanical limits, core thermal-hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.
 - d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 234 TO RENEWED FACILITY

OPERATING LICENSE NO. DPR-42

AND AMENDMENT NO. 222 TO RENEWED FACILITY

OPERATING LICENSE NO. DPR-60

NORTHERN STATES POWER COMPANY - MINNESOTA

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

DOCKET NOS. 50-282 AND 50-306

1.0 INTRODUCTION

By application dated January 29, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20029D693), Northern States Power Company, a Minnesota Corporation (NSPM, the licensee), requested changes to the technical specifications (TSs) for Prairie Island Nuclear Generating Plant, Units 1 and 2 (Prairie Island).

The proposed changes revise Technical Specification (TS) 3.2.1, "Heat Flux Hot Channel Factor ($F_Q(Z)$)", and TS 5.6.5, "CORE OPERATING LIMITS REPORT (COLR)", to be consistent with U.S. Nuclear Regulatory Commission (NRC)-approved Westinghouse topical report WCAP-17661-P-A, Revision 1, "Improved RAOC [Relaxed Axial Offset Control] and CAOC [Constant Axial Offset Control] F_Q Surveillance Technical Specifications," dated February 2019 (ADAMS Accession Nos. ML19225C083 and ML19225C084; non-public, withheld under Section 2.390 of Title 10 of the *Code of Federal Regulations* (10 CFR)), to address the issues identified in Westinghouse Nuclear Safety Advisory Letter (NSAL) NSAL-09-5, Revision 1, "Relaxed Axial Offset Control F_Q Technical Specification Actions," dated September 23, 2009.¹ The proposed amendment also addresses issues identified in Westinghouse NSAL-15-1, "Heat Flux Hot Channel Factor Technical Specification Surveillance," dated February 3, 2015.²

¹ Westinghouse Electric Company issues NSALs to its customers to communicate a potential safety issue so that the customers can conduct a review of the issue and determine whether any action is required. The NRC does not have an official record copy of NSAL-09-05.

² Westinghouse Electric Company issues NSALs to its customers to communicate a potential safety issue so that the customers can conduct a review of the issue and determine whether any action is required. The NRC does not have an official record copy of NSAL-15-1.

2.0 REGULATORY EVALUATION

2.1 Proposed Changes

Prairie Island is listed in NSAL-09-05 and NSAL-15-1 as Westinghouse plants affected by specific issues with the F_Q surveillance approach. As a result of the issues identified in these NSALs, NSPM determined that the Prairie Island TSs were non-conservative. Implementation of the revision to Prairie Island TSs consistent with WCAP-17661-P-A, Revision 1 will resolve the non-conservatism. This amendment request adopts the TS changes described in Appendix A of WCAP-17661-P-A, Revision 1. NSPM also plans, as part of implementing the proposed amendment, to apply the TS Bases changes described in Appendix B and to revise the core operating limits report (COLR) consistent with Appendix C of WCAP-17664-P-A. These changes address issues described in Westinghouse NSAL-09-5, Revision 1 and Westinghouse NSAL-15-1.

Prairie Island uses the same TS format as the Improved Standard Technical Specifications (STS), NUREG-1431, Revision 4, "Standard Technical Specifications (STS) Westinghouse Plants," April 2012 (ADAMS Accession Nos. ML12100A222 and ML12100A228), on which WCAP-17661-P-A, Revision 1 was based.

The NRC staff reviewed the proposed TS changes to assure that the changes are consistent with the changes proposed in WCAP-17661, Revision 1. The specific changes are described in the following subsections.

2.1.1 Proposed Changes in Note and Required Actions for Limiting Condition for Operation 3.2.1, Actions, Condition A

- (1) Change Limiting Condition for Operation (LCO) 3.2.1, Actions, Condition A, Note from current: "Required Action A.4 shall be completed whenever this Condition is entered" to "Required Action A.4 shall be completed whenever this Condition is entered prior to increasing THERMAL POWER above the limit of Required Action A.1. SR [Surveillance Requirement] 3.2.1.2 is not required to be performed if this Condition is entered prior to THERMAL POWER exceeding 75% RTP [Rated Thermal Power] after a refueling."
- (2) Change LCO 3.2.1, Required Action A.2 from current: "Reduce Power Range Neutron Flux - High trip setpoints $\geq 1\%$ for each $1\% F_Q^C(z)$ exceeds limit" to "Reduce Power Range Neutron Flux - High trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action A.1."
- (3) Change LCO 3.2.1, Required Action A.3 from current: "Reduce Overpower ΔT trip setpoints $\geq 1\%$ for each $1\% F_Q^C(z)$ exceeds limit" to "Reduce Overpower ΔT trip setpoints $\geq 1\%$ for each 1% that THERMAL POWER is limited below RATED THERMAL POWER by Required Action A.1."

2.1.2 Proposed Changes in Note and Required Actions for LCO 3.2.1, Actions, Condition B

- (1) Move current LCO 3.2.1, Actions, Condition B, Note: "Required Action B.4 shall be completed whenever this Condition is entered" to the new Required Action B.2.1, Note, and revise the language to "Required Action B.2.4 shall be completed whenever Required Action B.2.1 is performed prior to increasing THERMAL POWER above the limit of Required Action B.2.1."
- (2) Change Required Action B.1, "Reduce AFD [axial flux difference] limits $\geq 1\%$ for each $1\% F_Q^W(z)$ exceeds limit" to new Required Action B.1.1 and revise the language to "Implement a RAOC operating space specified in the COLR that restores $F_Q^W(z)$ to within its limits."
- (3) Add new Required Action B.1.2, "Perform SR 3.2.1.1 and SR 3.2.1.2 if control rod motion is required to comply with the new operating space" with an associated Completion Time of 72 hours.
- (4) Add new Required Action B.2.1, "Limit THERMAL POWER to less than RATED THERMAL POWER and reduce AFD limits as specified in the COLR" with an associated Completion Time of 4 hours.
- (5) Renumber Required Action B.2 as B.2.2 and Required Action B.3 as B.2.3.
- (6) Renumber Required Action B.4 as B.2.4 and change Completion Time from current: "Prior to increasing THERMAL POWER above the maximum allowable power of the AFD limits" to "Prior to increasing THERMAL POWER above the limit of Required Action B.2.1."

2.1.3 Proposed Changes in Surveillance Requirement for LCO 3.2.1 (SRs 3.2.1.1 and 3.2.1.2)

- (1) Delete current SR Note (applied to SR 3.2.1.1 and 3.2.1.2) for LCO 3.2.1: "During power escalation at the beginning of each cycle, THERMAL POWER may be increased until an equilibrium power level has been achieved, at which a power distribution measurement is obtained."
- (2) Delete current SR 3.2.1.2 Note, "If measurements indicate that the maximum over $z \left[\frac{F_Q^C(z)}{k(z)} \right]$ has increased since the previous evaluation of $F_Q^C(z)$: a. Increase $F_Q^W(z)$ by an appropriate factor specified in the COLR and reverify $F_Q^W(z)$ is within limits; or b. Repeat SR 3.2.1.2 once per 7 EFPD [effective full power days] until either a. above is met or two successive power distribution measurements indicate that the maximum over $z \left[\frac{F_Q^C(z)}{k(z)} \right]$ has not increased."
- (3) Change the first SR Frequency for SR 3.2.1.2 from current: "Once within 12 hours after achieving equilibrium conditions after each refueling after THERMAL POWER exceeds 75% RTP" to "Once after each refueling within 24 hours after THERMAL POWER exceeding 75% RTP."

- (4) Change the second SR Frequency for SR 3.2.1.1 from current: "Once within 12 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^c(z)$ was last verified" to "Once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^c(z)$ was last verified."
- (5) Change the second SR Frequency for SR 3.2.1.2 from current: "Once within 12 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^w(z)$ was last verified" to "Once within 24 hours after achieving equilibrium conditions after exceeding, by $\geq 10\%$ RTP, the THERMAL POWER at which $F_Q^w(z)$ was last verified."
- (6) Add the following reference in TS 5.6.5:

34. WCAP-17661-P-A, "Improved RAOC and CAOC FQ Surveillance Technical Specifications", February 2019.

2.2 Regulatory Requirements

The categories of items required to be in the TSs are provided in 10 CFR 50.36(c). As required by 10 CFR 50.36(c)(2)(i), the TSs will include LCOs, which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. Per 10 CFR 50.36(c)(2)(i), when an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met. The regulation at 10 CFR 50.36(c)(3) requires TSs to include SRs, which are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met.

Prairie Island was not licensed to the 10 CFR Part 50, Appendix A, General Design Criteria (GDC). Prairie Island was designed and constructed to comply with NSPM's understanding of the intent of the Atomic Energy Commission's (AEC) General Design Criteria for Nuclear Power Plant Construction Permits, as proposed on July 10, 1967. Since the construction of Prairie Island was significantly completed prior to the February 20, 1971 issuance of 10 CFR Part 50, Appendix A, the plant was not reanalyzed and the Updated Safety Analysis Report (USAR) was not revised to reflect the later criteria. However, the AEC Safety Evaluation Report acknowledged that the principal design criteria as described in the Prairie Island USAR conforms to the intent of the 10 CFR 50, Appendix A GDC and therefore the 10 CFR 50, Appendix A, GDC apply to this license amendment request (LAR) review.

2.3 Relevant Guidance

The applicable principal design criterion (PDC), as documented in the Prairie Island USAR, Section 3.1.2, are:

PDC 6, "Reactor Core Design," which states the reactor core with its related controls and protection systems shall be designed to function throughout its design lifetime without exceeding acceptable fuel damage limits which have been stipulated and justified. The core and related auxiliary system designs shall provide this integrity under all expected conditions of

normal operation with appropriate margins for uncertainties and for specified transient situations which can be anticipated.

Generic Letter (GL) 88-16, "Removal of Cycle-Specific Parameter Limits from Technical Specifications," dated October 4, 1988 (ADAMS Accession No. ML031130447), which provides a means by which the values of certain parameters could be determined and modified on a cycle-specific basis without prior NRC review and approval. In order to implement this guidance, licensees are required to: (1) use NRC-approved methodology to determine the operating limits; (2) include a list in the TS Administrative Controls section of the references used to determine the operating limits; and (3) maintain the limits in a COLR, which must be submitted to the NRC for information.

Chapter 16.0, "Technical Specifications," of NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light Water Reactors] Edition," March 2010 (ADAMS Accession No. ML100351425) and NUREG-1431, Revision 4, which provide guidance to NRC staff for review of TSs.

3.0 TECHNICAL EVALUATION

NSAL-09-5, Revision 1 notified Westinghouse customers of an issue associated with the Required Actions for Condition B of NUREG-1431 TS 3.2.1B, "Heat Flux Hot Channel Factor ($F_Q(Z)$ (RAOC-W(Z) Methodology)," for plants that have implemented the relaxed axial offset control (RAOC) methodology. In certain situations where transient F_Q , $F_Q^w(z)$ is not within its limit, the existing Required Actions may be insufficient to restore $F_Q^w(z)$ within the limit.

NSAL-09-5, Revision 1 provided clarification regarding the applicability of the recommended interim actions to address this issue. NSPM evaluated NSAL-09-5, Revision 1, under the corrective action program and determined Prairie Island TS 3.2.1, Condition B, was non-conservative. As a result, NSPM implemented additional administrative controls until the TS could be amended. Implementing the TS changes of WCAP-17661-P-A, Revision 1, will provide a resolution.

NSAL-15-1, notified Westinghouse customers of an issue associated with TS SR 3.2.1.2. Specifically, the SR may not be sufficient to assure that the peaking factor assumed in the licensing basis analysis remains valid under all conditions between the instances of performance of SR 3.2.1.2. NSPM evaluated the issue of NSAL-15-1 under the corrective action program and incorporated Westinghouse's recommended changes to TS SR 3.2.1.2 into the Prairie Island surveillance procedures used to implement TS SR 3.2.1.2. Implementing the improved methodology will address the NSAL-15-1 issue by inclusion of the penalty factor from the SR 3.2.1.2 NOTE in the surveillance formulation and therefore make it applicable at all times.

The applicability of TS changes as proposed in WCAP-17661-P-A, Revision 1 to Prairie Island, is addressed in Section 3.0 of the LAR, which states that the TS changes proposed in WCAP-17661-P-A, Revision 1 are applicable to Prairie Island. The NRC staff has reviewed the evaluation and found that the applicability is acceptable because Prairie Island is a RAOC plant in which the RAOC surveillance formulations and required actions were proposed in WCAP-17661-P-A, Revision 1 and the licensee addressed the applicable Limitations imposed by the safety evaluation (SE) on the application of WCAP-17661.

The NRC staff further reviewed the changes proposed by the licensee as discussed in Section 2.1 of this SE and ensured that the proposed TS changes will continue complying with the requirements of 10 CFR 50.36. Details for the review are shown below.

3.1 Evaluation on Proposed Changes in Note and Required Actions for LCO 3.2.1, Action, Condition A

The proposed revision to the Required Actions A.2 and A.3 has been verified as consistent with WCAP-17661, Revision 1. It addresses a potential issue with the current Actions for surveillance at part-power. These changes will require an appropriate conservative reduction of the setpoints to assure that the limits on $F_Q^c(z)$ assumed in the accident analyses remain valid. With the change, the requirements are appropriate for implementation since they are associated with the power level reductions defined in Required Action A.1.

The proposed revision to the Note has been verified as consistent with WCAP-17661, Revision 1. The Note was made consistent with the changes in the Required Actions and SRs, and more explicitly, to resolve the issue as described in Section 3.0 of this SE.

Based on the above, the NRC staff find the proposed changes acceptable because they are consistent with the approved changes in the topical report and consistent with the requirements established in 10 CFR 50.36(c)(2) for remedial actions, which are established for conditions when an LCO is not met.

3.2 Evaluation on Proposed Changes in Note and Required Actions for LCO 3.2.1, Action, Condition B

The proposed changes in Note and Required Action for LCO 3.2.1, Actions, Condition B, have been verified as consistent with WCAP-17661, Revision 1.

The current Note for Condition B, which required the performance of SR 3.2.1.1 and 3.2.1.2 whenever the Condition B was entered, is proposed to be moved and revised for the new Required Action B.2.1. The NRC staff finds the removal and revision of current Note for Condition B under the new Required Action B.2.1 acceptable because the new Required Action B.2.1 is added to restore $F_Q^w(z)$ to within its limits whenever Condition B was entered by limiting thermal power to less than rated thermal power and reducing AFD limits that the applicable power level and AFD limits to assure $F_Q^w(z)$ within limits will be provided in COLR.

Current Required Action B.1, was proposed to be deleted and replaced with:

- (1) The new Required Action B.1.1 to implement a RAOC operating space specified in the COLR that restores $F_Q^w(z)$ to within its limits whenever $F_Q^w(z)$ is determined to be not within the limits (i.e. entering Condition B) if no control rod motion is needed, and
- (2) The new Required Action B.1.2 to perform SRs 3.2.1.1 and 3.2.1.2 if control rod motion is required to comply with the new operating space when Condition B is entered. A 72-hour Completion Time is provided to ensure that the plant has time to restore equilibrium conditions in the situation that control rod motion result in transient conditions in order to restores $F_Q^w(z)$ to within its limits.

The NRC staff find the proposed changes acceptable because they appropriately applied the approved new RAOC methodology of WCAP-17661 of using different operating spaces in terms of with or without control rod motion to gain margin improvement. In addition, an inclusion of the requirements to perform SRs 3.2.1.1 and 3.2.1.2 in Required Action B.1.2 is prudent to assure that the changes in the $F_Q^c(z)$ and $F_Q^w(z)$ remain acceptable.

When the RAOC operating space defined in the COLR are insufficient to ensure margin to the $F_Q^w(z)$ limits, the new Required Actions (B.2.1, B.2.2, B.2.3, and B.2.4) are entered. The actions involve reducing the thermal power to less than the thermal power level and AFD limits as specified in the COLR.

Based on the above, the NRC staff find the proposed changes acceptable because they provide remedial actions that can be taken until the conditions of the LCO are met, consistent with the requirements established in 10 CFR 50.36(c)(2).

3.3 Evaluation on Proposed Changes in SRs 3.2.1.1 and 3.2.1.2

The proposed revision to the SRs 3.2.1.1 and 3.2.1.2 Notes and Frequencies has been verified as consistent WCAP-17661, Revision 1.

The deletion of Note in the SR for LCO 3.2.1, "During power escalation at the beginning of each cycle, THERMAL POWER may be increased until an equilibrium power level has been achieved, at which a power distribution measurement is obtained," can prevent operators from reaching different interpretations of what the TS requires. The removal of this Note will remove any requirement for obtaining equilibrium conditions during the first power distribution map measuring $F_Q^c(z)$. $F_Q^c(z)$ will be required to be verified after each refueling prior to exceeding 75% RTP in the first part of the Frequency. The removal of this Note will also remove the requirement of the determination of $F_Q^w(z)$ until 24 hours after exceeding 75% RTP, instead of before exceeding 75% RTP following a refueling outage as currently specified.

The justification to delete Note for SR 3.2.1.2 is that the required penalty factor is part of the $F_Q^w(z)$ formulation in the WCAP-17661-P-A methodology. A penalty factor is introduced and will be included in the COLR. The magnitude of the penalty factor is calculated based on the predicted margin trends and no additional assumptions or considerations are necessary.

Based on the above, the NRC staff finds that the deletion of Notes for the SRs for LCO 3.2.1 will eliminate the potential confusion and inconsistency in the licensee's interpretation of the TS requirements and the required penalty factor for SR 3.2.1.2 Note will be embedded in the WCAP-17661-P-A methodology and COLR. The proposed changes are in conformance with GL 88-16 because the changes use NRC-approved methodology to determine the operating limits and maintain the limits in COLR that, in turn, meet PDC 6 to assure that specified acceptable fuel design limits are not exceeded. Therefore, the deletion of Notes in the SRs for LCO 3.2.1 is acceptable.

The revision of the first Frequency for SR 3.2.1.2 from "Once within 12 hours after achieving equilibrium conditions after each refueling after THERMAL POWER exceeds 75% RTP" to

“Once after each refueling within 24 hours after THERMAL POWER exceeds 75% RTP” basically makes two changes:

- (1) Revision of “12 hours” to “24 hours,” and
- (2) Deletion of “after achieving equilibrium conditions.”

The licensee relied on WCAP-17661-P-A and Section 3.2.5 of WCAP-17661-P-A provides the following justification for these changes:

- (a) Some plant TSs have “12 hours” instead of “24 hours.”
- (b) The “24 hours” surveillance interval is reasonable because performing the initial verification of $F_Q^W(z)$ within longer time period after exceeding 75% RTP will ensure that the surveillance will be performed with more appropriate steady state peaking factors measured at or near the power level where future non-equilibrium operation could be limiting.
- (c) If the surveillance indicates that future non-equilibrium operation could challenge the limit, the Required Actions in the improved F_Q TS will provide appropriate compensatory measures to ensure that the LCO will be met during such operation.

As stated in Section 4.7 in the SE of WCAP-17661-P-A, the intent of SR 3.2.1.2 is to ensure that the F_Q will be maintained during future non-equilibrium operation within the allowed operating spaces.

For the revision of the second Frequency for SR 3.2.1.1 and SR 3.2.1.2 from “Once within 12 hours after achieving equilibrium conditions” to “Once within 24 hours after achieving equilibrium conditions,” the licensee relied on WCAP-17661-P-A and also proposed TS Bases for this change. Section 3.2.5 of WCAP-17661-P-A provides justification for this change that:

- (a) Some plant TSs specify “12 hours” instead of “24 hours.”
- (b) The “24 hours” surveillance interval is reasonable because it will provide a more accurate measurement of $F_Q^W(z)$ by allowing sufficient time to achieve equilibrium conditions and obtain the power distribution measurement.
- (c) The probability for a limiting power shapes or limiting design basis events to occur prior to complete the surveillance within 24 hours is extremely small.

NRC staff stated in the SE of WCAP-17661-P-A that, for the surveillances performed with 24 hours instead of 12 hours after achieving the higher power plateau, the risk of exceeding the F_Q limit is acceptably minimized.

Based on the above, the NRC staff finds that the revisions of the first Frequency for SR 3.2.1.2 and the second Frequency for SR 3.2.1.1 and SR 3.2.1.2 will improve the ability to perform more accurate $F_Q^W(z)$ margin assessment. The proposed changes are consistent with the requirements established in 10 CFR 50.36(c)(3) for SRs to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCO will be met. Therefore, the Frequency revisions noted above are acceptable.

3.4 Variations

NSPM proposed the following variations from the TS changes described in Appendix A of WCAP-17661-P-A:

- 1) Different titles – the NUREG-1431 title for TS Section 3.2.1 changes from FQ(Z) (RAOC W(Z) Methodology) to FQ(Z) (RAOC T(Z) Methodology). The Prairie Island title for TS Section 3.2.1 is simply FQ(Z), so no title change is proposed.
- 2) Frequency of SR 3.2.1.2 – NUREG-1431 includes a first Frequency that is different than the current Prairie Island TS SR 3.2.1.2. This Frequency will be changed to match that in WCAP-17661-P-A.

The above proposed changes are acceptable because the first variation is an editorial change without any impact on the TS LCO and SR and the second variation has been evaluated in Section 3.3 as acceptable.

3.5 Technical Evaluation Conclusion

The NRC staff reviewed the proposed TS changes by comparing them with the applicable TS changes made in the NRC-approved topical report and evaluating the proposed changes against the applicable regulatory requirements of PDC and 10 CFR 50.36. The NRC staff found that the proposed TS changes are consistent with the applicable changes proposed in the NRC-approved topical report and met the applicable regulatory requirements of PDC and 10 CFR 50.36 as evaluated in this SE. Therefore, the proposed TS changes are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Minnesota State official was notified of the proposed issuance of the amendments on December 21, 2020. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change the requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or change the surveillance requirements. The 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 published in the *Federal Register* on March 24, 2020 (85 FR 16684). 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.

6.0 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) there is reasonable assurance that 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.

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Date of Issuance: February 5, 2021

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENT NOS. 234 AND 222 RE: ISSUES IDENTIFIED IN WESTINGHOUSE NUCLEAR SAFETY ADVISORY LETTERS NSAL-09-05, REVISION 1, AND NSAL-15-1 (EPID L-2020-LLA-0014) DATED FEBRUARY 5, 2021

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