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

August 17, 2022

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 AMENDMENTS 240 AND 228 RE: REACTOR TRIP SYSTEM POWER RANGE INSTRUMENTATION CHANNELS (EPID L-2021-LLA-0180)

Dear Mr. Domingos:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 240 to Renewed Facility Operating License No. DPR-42 and Amendment No. 228 to Renewed Facility Operating License No. DPR-60 for the Prairie Island Nuclear Generating Plant, Units 1 and 2, respectively. The amendments consist of changes to the technical specifications in response to your application dated October 2, 2021.

The amendments revise Technical Specification 3.3.1, "Reactor Trip System (RTS) Instrumentation" for the Power Range RTS instrumentation channels.

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. 240 to DPR-42
2. Amendment No. 228 to DPR-60
3. Safety Evaluation

cc: Listserv

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

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-282

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 240
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 October 2, 2021, 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) <u>Technical Specifications</u>

    The Technical Specifications contained in Appendix A, as revised through Amendment No. 240, 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 within 30 days of issuance or installation of permanent bypass capability.

FOR THE NUCLEAR REGULATORY COMMISSION

Nancy L. Salgado

Digitally signed by Nancy L. Salgado
Date: 2022.08.17 10:59:24 -04'00'

Nancy L. Salgado, Chief
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: August 17, 2022

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

NORTHERN STATES POWER COMPANY

DOCKET NO. 50-306

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 228
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 October 2, 2021, 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. 228, 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 within 30 days of issuance or installation of permanent bypass capability.

FOR THE NUCLEAR REGULATORY COMMISSION

Nancy L. Salgado

Digitally signed by Nancy L. Salgado
Date: 2022.08.17 11:00:00 -04'00'

Nancy L. Salgado, Chief
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: August 17, 2022

ATTACHMENT TO LICENSE AMENDMENT NOS. 240 AND 228

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
3.3.1-2	3.3.1-2
3.3.1-15	3.3.1-15
3.3.1-16	3.3.1-16
3.3.1-17	3.3.1-17

(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) <u>Maximum Power Level</u>

NSPM is authorized to operate the facility at steady state reactor core power levels not in excess of 1677 megawatts thermal.

(2) <u>Technical Specifications</u>

The Technical Specifications contained in Appendix A, as revised through Amendment No. 240, are hereby incorporated in the renewed operating license. NSPM shall operate the facility in accordance with the Technical Specifications.

(3) <u>Physical Protection</u>

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. 228, 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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One channel or train inoperable.	C.1 Restore channel or train to OPERABLE status.	48 hours
	<u>OR</u>	
	C.2.1 Initiate action to fully insert all rods.	48 hours
	<u>AND</u>	
	C.2.2 Place the Rod Control System in a condition incapable of rod withdrawal.	49 hours
D. One Power Range Neutron Flux channel inoperable.	----------------NOTE----------------- One channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment. ---------------------------------------	
	D.1.1 Place channel in trip.	6 hours <u>OR</u> In accordance with the Risk Informed Completion Time Program
	<u>AND</u>	

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.6	-----------------------------NOTE---------------------------- Not required to be performed until 24 hours after THERMAL POWER is ≥ 75% RTP. --- Calibrate excore channels to agree with core power distribution measurements.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.7	----------------------------NOTES---------------------------- 1. Not required to be performed for source range instrumentation prior to entering MODE 3 from MODE 2 until 4 hours after entry into MODE 3. 2. The RPS input relays are excluded from the Surveillance for Functions 2.a and 3. --- Perform COT.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.8	---------------------------NOTES------------------------- 1. This Surveillance shall include verification that interlocks P-6 and P-10 are in their required state for existing unit conditions. 2. Not required to be performed for intermediate and source range instrumentation prior to reactor startup following shutdown ≤ 48 hours. 3. The RPS input relays are excluded from this Surveillance for Function 2.b. ---	--------NOTE------- Only required when not performed within the Frequency specified in the Surveillance Frequency Control Program -----------------------
	Perform COT.	Prior to reactor startup <u>AND</u> Twelve hours after reducing power below P-10 for power and intermediate range instrumentation <u>AND</u> Four hours after reducing power below P-6 for source range instrumentation <u>AND</u>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.1.8 (continued)	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.9 ----------------------------NOTE---------------------------- Verification of setpoint is not required. -- Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.10 ---------------------------NOTE---------------------------- This Surveillance shall include verification that the time constants are adjusted to the prescribed values. -- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.11 --------------------------NOTE---------------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 240 TO RENEWED FACILITY

OPERATING LICENSE NO. DPR-42

AND AMENDMENT NO. 228 TO RENEWED FACILITY

OPERATING LICENSE NO. DPR-60

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

DOCKET NOS. 50-282 AND 50-306

1.0 INTRODUCTION

By application dated October 2, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21277A173), Northern States Power Company, a Minnesota Corporation, doing business as Xcel Energy (NSPM, the licensee), requested changes to the Technical Specifications (TSs) for Prairie Island Nuclear Generating Plant, Units 1 and 2 (Prairie Island).

The proposed change revises TS 3.3.1, “Reactor Trip System (RTS) Instrumentation” for the Power Range (PR) RTS instrumentation channels. This change will allow the PR RTS instrumentation channels to be bypassed during surveillance testing. Additionally, this change will allow the input relays from the PR RTS instrumentation channels to be excluded from the Channel Operational Test (COT). As such, this change to TS 3.3.1 will allow for testing of the PR RTS instrumentation channels with a permanently installed PR RTS bypass capability.

2.0 REGULATORY EVALUATION

2.1 Background

The Nuclear Instrumentation System (NIS) PR RTS functions use two-out-of-four coincidence logic from redundant channels to initiate protective actions. In the current design, the analog channel comparators are placed in the "tripped" condition during channel testing. Routine testing of a channel in the tripped position can result in the potential for an unnecessary reactor trip if a second comparator trips in a redundant channel, which can be caused by a human error, spurious transient, or channel failure.

With the installation of the PR NIS Bypass Test Instrumentation (BTI) and the implementation of this TS change, Prairie Island can avoid a spurious reactor trip due to the partial trip conditions

during channel testing by placing the channel in bypass. When a PR RTS instrumentation channel is placed in bypass, the two-out-of-four logic will become a two-out-of-three logic; therefore, the function will still provide the necessary RTS function with three channels of redundancy while the fourth channel is being tested.

2.2 Proposed Changes

The proposed changes to TS 3.3.1 will allow testing of the NIS PR RTS functions in bypass following the installation of permanent test panels for each NIS PR channel. These test panels will allow performance of the COT by placing the channel in bypass instead of placing the channel in a tripped condition. Light-emitting diodes on the test panels will provide positive indication of channels placed in bypass. Annunciator signals will be provided to the main control board by the test panels when the channel bypass switch on a test panel is switched to bypass mode.

The following functions in the RTS instrumentation will be capable of being bypassed for testing:

Function 2a – Power Range Neutron Flux - High, under Condition D per SR 3.3.1.7,
Function 2b – Power Range Neutron Flux - Low, under Condition D per SR 3.3.1.8,
Function 3a – Power Range Neutron Flux Rate - High Positive Rate, under Condition D per SR 3.3.1.7, and
Function 3b – Power Range Neutron Flux Rate - High Negative Rate, under Condition D per SR 3.3.1.7

The proposed changes will revise the Required Actions Note in TS 3.3.1, Condition D, and the Notes in Surveillance Requirements (SRs) 3.3.1.7 and 3.3.1.8. The Condition D Note will be revised to allow testing a channel in bypass and the SR Notes will be revised to exclude the RTS input relays during the performance of a COT to allow testing in bypass. However, the RTS input relays will continue to be tested (i.e., tripped) during the channel calibration (SR 3.3.1.11) in accordance with the frequency specified in the Surveillance Frequency Control Program.

2.3 Regulatory Requirements and Guidance

2.3.1 Regulatory Requirements

The U.S. Nuclear Regulatory Commission's (NRC) regulatory requirements related to the content of the TSs are set forth in 10 CFR 50.36, "Technical specifications." As discussed in 10 CFR 50.36(c)(3), SRs 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 limiting condition for operations will be met. This license amendment request (LAR) involves an SR that will allow testing of the NIS PR RTS functions in bypass.

The regulation at 10 CFR 50.54(jj) conditions the operating license such that structures, systems, and components subject to the codes and standards in 10 CFR 50.55a must be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety function to be performed. The LAR involves testing of components subject to the Codes and Standards in 10 CFR 50.55a.

2.3.2 General Design Criteria

Appendix A to 10 CFR 50 describes general design criteria (GDC) that establish minimum requirements for the principal design criteria for water-cooled nuclear power plants similar in design and location to plants for which construction permits have been issued by the Commission.

The Prairie Island Updated Safety Analysis Report, Section 1.5 (ML22124A061) states that:

> Prairie Island Nuclear Generating Plant was designed and constructed to comply with the NSP's [Northern States Power] understanding of the intent of the AEC General Design Criteria [AEC GDC] for Nuclear Power Plant Construction Permits, as proposed on July 10, 1967 (Reference 1). Since the construction of the plant was significantly completed prior to the issuance of the February 20, 1971, Appendix A General Design Criteria, the plant was not reanalyzed, and the FSAR [Final Safety Analysis Report] was not revised to reflect these later criteria. However, the AEC Safety Evaluation Report acknowledged that the AEC staff assessed the plant, as described in the FSAR, against the Appendix A design criteria and "are satisfied that the plant design generally conforms to the intent of these criteria."

The AEC GDC applicable to the proposed changes is Criterion 19 - Protection Systems Reliability. This criterion states that "[p]rotection systems shall be designed for high functional reliability and in-service testability commensurate with the safety functions to be performed."

2.3.3 Standard Review Plan

The NRC staff reviewed this LAR based on Appendix 7.1-B, Revision 6, "Guidance for Evaluation of Conformance to IEEE [Institute of Electrical and Electronics Engineers] Std 279," August 2016 (ML16019A091) and Section 7.2, Revision 6, "Reactor Trip System," August 2016 of the NUREG-0800, Chapter 7 "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition — Instrumentation and Controls" (ML16020A059).

2.3.4 Regulatory Guides

The following Regulatory Guides (RGs) are applicable to the changes proposed in the LAR.

RG 1.47, Revision 1, "Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems" (ML092330064) discusses an acceptable method of complying with the requirements of IEEE Standard 279-1971. RG 1.47 states that automatic indication should be provided in the control room for each bypass or deliberately induced inoperable status that meets all of the following conditions:

a) Renders inoperable any redundant portion of the protection system, systems actuated or controlled by the protection system, and auxiliary or supporting systems that must be operable for the protection system and the system it actuates to perform their safety-related functions.

b) Expected to occur more frequently than once per year.
c) Expected to occur when the affected system is normally required to be operable.

RG 1.118, Revision 3, "Periodic Testing of Electric Power and Protection Systems," (ML003739468) endorses IEEE Standard 338-1987 for periodic testing of protection systems subject to providing a method of preventing the expansion of any bypass condition to redundant channels. This is accomplished by administrative control of access to the bypass capability.

RG 1.22, Revision 0 "Periodic Testing of Protection System Actuation Functions," (ML083300530) describes acceptable methods of including the actuation devices in the periodic tests of the protection system during reactor operation.

RG 1.30, Revision 0, "Quality Assurance Requirements for the Installation Inspection, and Testing Instrumentation and Electric Equipment," (ML081270243) describes an acceptable method of complying with the Commission's regulations with regard to the quality assurance requirements for the installation, inspection, and testing of nuclear power plant instrumentation and electric equipment.

2.3.5 Institute of Electrical and Electronics Engineers Standards

The following IEEE Standards are applicable to the proposed changes:

The NRC staff identifies the following IEEE 279-1968 "Proposed IEEE Criteria for Nuclear Power Plant Protection Systems" clauses are applicable or relevant to the installation of the PR NIS BTI panel:

- 4.2 Single Failure Criterion
- 4.3 Quality of Components and Modules
- 4.4 Equipment Qualification
- 4.10 Capability for Test and Calibration
- 4.11 Channel Bypass or Removal from Operation
- 4.12 Operating Bypasses
- 4.13 Indication of Bypasses
- 4.14 Access to Means for Bypassing
- 4.20 Information Read-Out

IEEE 338-1987, "IEEE Standard Criteria for the Periodic Testing of Nuclear Power Generating Station Class 1E Power and Protection Systems," discusses the criteria for performing periodic testing of safety systems.

3.0 TECHNICAL EVALUATION

3.1 Evaluation of Proposed Changes

The LAR states that the PR NIS BTI design has sufficient reliability to ensure that a single failure will not cause the protection system to be unable to perform its function. The LAR describes the failure mode that could degrade the RTS reliability for a channel to inadvertently stay in the bypass mode. Sections 4.1.4 and 4.2.2 of Enclosure 2 to the LAR state that, for this failure to occur, the main breaker, the key switch, and the toggle switch all have to fail at the same time. Additionally, the main control board annunciator panel indication would also have to

fail such that the operators would not be able to identify that all three of those failures had occurred.

In addition, Enclosure 2, Section 4.2.8 of this LAR states that "The factory acceptance test (FAT) will be performed at a 10 CFR Part 50, Appendix B facility before shipping the hardware to the site." Because testing of the components of main breaker, the key switch, and the toggle switch will all be performed at a facility with a quality assurance program consistent with the quality assurance regulations in Appendix B to 10 CFR Part 50, the NRC staff has reasonable assurance that the FAT will be reliable. Therefore, the likelihood of an event where "a channel inadvertently stays in the bypass mode," which is a product of the unreliability of the main breaker, the key switch, and the toggle switch, will be remote. Furthermore, the RTS design and its in-service test process (beyond the bypass by this PR NIS BTI) remain unchanged. Therefore, its reliability and in-service testability remain high commensurate with the safety functions to be performed. Based on the above, the staff finds that the proposed change continues to satisfy AEC GDC 19, which requires protection systems be designed for high functional reliability and in-service testability commensurate with the safety functions to be performed.

RG 1.47 states that an indication should be provided in the control room for each bypass or deliberately induced inoperable statue. LAR Enclosure 2, Section 4.2.1 states that by placing a protection system channel in the bypass mode, that channel in the protection system is rendered inoperable. For any channel that is placed in the bypass mode, an automatic annunciation is initiated in the main control room. The LAR also stated that the PR NIS BTI meets all conditions specified in RG 1.47. After independently evaluating the statements in LAR Enclosure 2, section 4.2.1, the NRC staff finds the proposed changes are consistent with RG 1.47 because an indication will be provided in the control room for a channel in the bypass mode.

RG 1.118 endorses IEEE Standard 338-1987 for periodic testing of protection systems. RG 1.118 replaces Sections 5(15) and 6.4(5) of IEEE Std with the "makeshift test connections" positions:

- position 2.1 addresses "temporary jumper wires",
- position 2.2 addresses "removal of fuses or opening a breaker", and
- position 2.3 addresses "open circuits and temporary connections administrative verification."

These positions address the installation of jumper wires, removal of fuses or opening of breakers as a means of temporarily bypassing instrument trip functions, and position 2.3 provides guidance for providing administrative controls over the operation of channel bypass features. Position 3 includes the sensors in the periodic testing.

The NRC staff finds position 2.1 and 2.2 are not applicable as the PR NIS BTI design eliminates the use of jumper wires and removing fuses and opening breakers for the purpose of periodic testing. For position 2.3, the licensee confirmed in this LAR that "Xcel Energy will have administrative controls in place to perform periodic surveillance testing when using the PR NIS BTI Panel." The NRC staff evaluated the LAR's statement regarding administrative verifications and finds that it is consistent with RG 1.118 position 2.3. Furthermore, as indicated in this LAR,

> The in-containment sensors (PR ex-core detectors) are not directly connected to the PR NIS BTI panel. Within a protection

> channel, the PR NIS BTI panel is located between the NIS drawers and RTS; therefore, sensor testing is not applicable to the PR NIS BTI panel. The PR NIS BTI panel does not impact that RTS actuation logic test of any components. The PR NIS BTI panel only provides a means of testing the instrument channel in the bypass mode.

Since the sensors are not directly connected to the PR NIS BTI bypass panel, the periodic testing of the sensors will not be modified by the proposed changes. The NRC staff therefore concludes that the use of the PR NIS BTI does not change the periodic testing of the sensors, and the proposed changes are consistent with RG 1.118 position 3.

RG 1.22, Revision 0, “Periodic Testing of Protection System Actuation Functions,” (ML083300530) describes acceptable methods of including the actuation devices in the periodic tests of the protection system during reactor operation. This LAR indicates that:

> The PR NIS BTI panel provides a means of verifying that the 120V signal on the terminal blocks is present. If the 120V signal is not present on the terminal blocks, the PR channel would be in the tripped state and an annunciator on the MCB would identify it. Within a protection channel, the PR NIS BTI panel is located between the NIS drawers and the RTS; therefore, the PR NIS BTI panels do not directly interface with the actuation device. Therefore, the PR NIS BTI panel does not impact the testing of the actuation devices, and the testing of the actuation devices is not affected by the PR NIS BTI panel.

The presence of the 120V signal, in theory, ensures that the proposed changes enable periodic testing to extend to and include the actuation devices and actuated equipment. This is consistent with RG 1.22, which states that “[t]he protection system should be designed to permit periodic testing to extend to and include the actuation devices and actuated equipment.”

In addition, the PR NIS BTI panel provides a means for periodic testing as it allows testing a channel in bypass versus trip and reduces the potential for a spurious reactor trip during testing. A channel in bypass, without cautions of spuriously tripping the reactor, makes periodic testing of the protection that includes the actuation devices easier to implement. Based on the above, the NRC staff concludes that the proposed changes allow periodic tests of the protection system during reactor operation and are consistent with positions specified in RG 1.22.

The NRC staff also reviewed the quality assurance method that the licensee will use for the installation, inspection, and testing of the proposed changes. RG 1.30 describes an acceptable method of complying with the Commission’s regulations with regard to the quality assurance requirements for the installation, inspection, and testing of nuclear power plant instrumentation and electric equipment. The licensee indicates in the LAR Enclosure 2, Section 4.2.8 that the factory acceptance test (FAT) will be performed at a 10 CFR Part 50, Appendix B facility before shipping the hardware to the site.” A facility that meets all the requirements of 10 CFR Part 50 Appendix B assures compliance with the Commission’s regulations regarding quality assurance. The NRC staff therefore concludes that the quality assurance method the licensee will use for the installation, inspection, and testing of the proposed changes are consistent with RG 1.30.

10 CFR 50.55a(h)(2) requires that "[f]or nuclear power plants with construction permits issued before January 1, 1971, protection systems must be consistent with their licensing basis or may meet the requirements of IEEE Std. 603–1991 and the correction sheet dated January 30, 1995." The licensee analyzed the PR NIS BTI panel with the relevant criteria in IEEE Standard 603-1991, and concludes the proposed panel meets the IEEE Standard 603-1991. The NRC staff reviewed the licensee's analysis and confirmed that the proposed changes meet requirements specified in the IEEE Standard 603-1991.

The LAR Enclosure 2, Section 4.3.5, states that "[i]nstallation of the PR NIS BTI does not impact the capability for performing periodic tests that was originally designed into the equipment. The PR NIS BTI panel provides an alternative means of testing in bypass rather than in a tripped condition… The PR NIS BTI panel does not have any impact on the capability to perform any testing as discussed in the IEEE Standard [IEEE 338-1987]. The PR NIS BTI panel only allows the drawers to be tested in bypass." The LAR concludes that the PR NIS BTI panels have no effect on the RTS system compliance with this IEEE Standard. The NRC staff reviewed the licensee's analysis and confirmed that the proposed changes are consistent with RG IEEE Standard 338-1987 and are therefore acceptable.

3.2 Evaluation of Proposed TS Changes

Hardware modifications will be made so that testing in bypass can be accomplished without lifting leads or installing temporary jumpers. This satisfies the condition specified by the NRC in the safety evaluation issued during the review of "Evaluation of Surveillance Frequencies and Out of Service Times for the Reactor Protection Instrumentation System, WCAP-10271-P-A," May 1986 (ML18029A333, non-public). The impact of testing in bypass was previously evaluated and approved by the NRC during the review of WCAP-10271-P-A and was determined to be acceptable. In addition, the Technical Specification Task Force (TSTF) Traveler TSTF-418, Revision 2, "RPS and ESFAS Test Times and Completion Times (WCAP-14333)," March 2003 (ML030650848), as approved by NRC letter dated April 2, 2003 (ML030920633), established that bypass testing is an acceptable method of testing a channel without placing it in a trip condition. NUREG 1431, Revision 5, "Standard Technical Specifications – Westinghouse Plants, (ML21259A155) has incorporated TSTF-418 for plants with installed bypass test capability. In addition, the NRC staff independently examined the proposed TS changes against the IEEE 279–1968 criteria and confirmed that these changes are consistent with IEEE 279-1968 Clause 4.10 "Capability for Test and Calibration" and Clause 4.11 "Channel Bypass or Removal from Operation".

Under Condition D, the required action note is changed from "[t]he inoperable channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment of other channels" to "[o]ne channel may be bypassed for up to 4 hours for surveillance testing and setpoint adjustment." This change would allow a condition in which one channel is inoperable and one channel is in bypass for COT (per SR 3.3.1.7 for Functions 2.a and 3, and per SR 3.3.1.8 for Function 2.b). The NRC staff notes that under this worst-case scenario, the trip coincidence logic of all four NIS PR RTS Functions (2.a, 2.b, 3.a and 3.b) becomes 2-out-of-2 during the completion of the Action D.1.1 (place the inoperable channel in trip). Such a 2-out-of-2 logic preserves the NIS PR RTS trip capabilities, and associatively Action D.1.1 remains eligible for the application of the Risk Informed Completion Time (RICT) program. The NRC staff, therefore, determines that the proposed changes are acceptable.

3.3 Technical Evaluation Conclusion

Based on the above review, the NRC staff concludes that the proposed changes are consistent with the criteria established by the relevant RGs and are consistent with the applicable portions of IEEE 603-1991. Therefore, the proposed changes meet the intent of AEC GDC Criterion 19 and the applicable requirements in 10 CFR 50.36(c)(3) and 50.54(jj). Accordingly, the proposed 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 June 29, 2022. 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. 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, as published in the *Federal Register* on January 4, 2022 (87 FR 256), and there has been no public comment on such finding. 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: August 17, 2022

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: REACTOR TRIP SYSTEM POWER RANGE INSTRUMENTATION CHANNELS (EPID L 2021-LLA-0180) DATED AUGUST 17, 2022

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