



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

May 21, 2015

Mr. Kevin K. Davison
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 LICENSE AMENDMENTS REGARDING REVISION TO
TECHNICAL SPECIFICATION 3.8.1, "AC SOURCES - OPERATING"
(TAC NOS. MF4259 AND MF4260)

Dear Mr. Davison:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment Nos. 214 and 202 to Renewed Facility Operating License Nos. DPR-42 and DPR-60 for the Prairie Island Nuclear Generating Plant, Units 1 and 2, respectively. The amendments consist of changes to the technical specifications (TSs) in response to your application dated June 9, 2014, as supplemented by letter dated December 17, 2014.

The amendments revise TS 3.8.1, "AC [Alternating Current] Sources - Operating" Surveillance Requirements related to emergency diesel generator (EDG) steady-state voltage and frequency limits. The changes are designed to correct non-conservative EDG load values currently under administrative control, and to improve EDG operation and testing by providing a more conservative voltage and frequency band for operation when EDGs are not connected in parallel with the offsite sources.

K. Davison

- 2 -

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 black ink, appearing to read "Terry A. Beltz". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Terry A. Beltz, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-282 and 50-306

Enclosures:

1. Amendment No. 214 to DPR-42
2. Amendment No. 202 to DPR-60
3. Safety Evaluation

cc: Distribution via 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. 214
Renewed License No. DPR-42

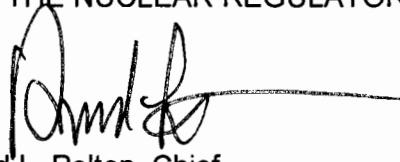
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Northern States Power Company - Minnesota (NSPM, the licensee), dated June 9, 2014, as supplemented by letter dated December 17, 2014, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in Title 10 of the *Code of Federal Regulations* (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:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 214, are hereby incorporated in the license. NSPM shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as its date of issuance and shall be implemented within 90 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read 'D. Pelton', with a long horizontal flourish extending to the right.

David L. Pelton, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License No. DPR-42 and
Technical Specifications

Date of Issuance: May 21, 2015

ATTACHMENT TO LICENSE AMENDMENT NO. 214

RENEWED FACILITY OPERATING LICENSE NO. DPR-42

DOCKET NO. 50-282

Replace the following page of Renewed Facility Operating License No. DPR-42 with the attached revised page. The change area is identified by a marginal line.

REMOVE

INSERT

- 3 -

- 3 -

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

REMOVE

INSERT

3.8.1-6

3.8.1-6

3.8.1-8

3.8.1-8

3.8.1-9

3.8.1-9

- (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. 214, 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

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|-----------|
| SR 3.8.1.1 Verify correct breaker alignment and indicated power availability for each required path. | 7 days |
| SR 3.8.1.2 -----NOTES----- 1. Performance of SR 3.8.1.6 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR in consideration of manufacturer’s recommendations. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.6 must be met. ----- Verify each DG starts from standby conditions and achieves steady state voltage ≥ 4084 V and ≤ 4400 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz. | 31 days |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|--|---|
| <p>SR 3.8.1.6 -----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify each DG starts from standby condition and achieves:</p> <ul style="list-style-type: none"> a. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 4084 V and ≤ 4400 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz. | <p>184 days</p> |
| <p>SR 3.8.1.7 Verify each DG does not trip during and following a load rejection of:</p> <ul style="list-style-type: none"> 1. Unit 1 ≥ 650 kW; and 2. Unit 2 ≥ 860 kW. | <p>24 months</p> |
| <p>SR 3.8.1.8 Verify each DG's automatic trips are bypassed on an actual or simulated safety injection signal except:</p> <ul style="list-style-type: none"> a. Engine overspeed; b. Generator differential current; and c. Ground fault (Unit 1 only). | <p>-----NOTE----- SR 3.0.2 interval extension (1.25 times the interval) applies to this SR -----</p> <p>24 months</p> |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|--|------------------|
| <p>SR 3.8.1.9 -----NOTES-----</p> <ol style="list-style-type: none"> 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.85. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. <p>-----</p> <p>Verify each DG operates for ≥ 24 hours:</p> <ol style="list-style-type: none"> a. For ≥ 2 hours loaded: <ul style="list-style-type: none"> Unit 1 ≥ 2832 kW, and ≤ 3000 kW Unit 2 ≥ 5400 kW, and ≤ 5940 kW; and b. For the remaining hours of the test loaded: <ul style="list-style-type: none"> Unit 1 ≥ 2500 kW, and Unit 2 ≥ 4860 kW; and c. Achieves steady state voltage ≥ 4084 V and ≤ 4400 V; and frequency ≥ 59.5 Hz and ≤ 60.5 Hz. | <p>24 months</p> |



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. 202
Renewed License No. DPR-60

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Northern States Power Company - Minnesota (NSPM, the licensee), dated June 9, 2014, as supplemented by letter dated December 17, 2014, 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 Title 10 of the *Code of Federal Regulations* (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:

Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 202, are hereby incorporated in the license. NSPM shall operate the facility in accordance with the Technical Specifications.

Enclosure 2

3. This license amendment is effective as of its date of issuance and shall be implemented within 90 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read 'D. Pelton', with a long horizontal line extending to the right.

David L. Pelton, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License No. DPR-60 and
Technical Specifications

Date of Issuance: May 21, 2015

ATTACHMENT TO LICENSE AMENDMENT NO. 202

RENEWED FACILITY OPERATING LICENSE NO. DPR-60

DOCKET NO. 50-306

Replace the following page of Renewed Facility Operating License No. DPR-60 with the attached revised page. The change area is identified by a marginal line.

REMOVE

INSERT

- 3 -

- 3 -

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

REMOVE

INSERT

3.8.1-6

3.8.1-6

3.8.1-8

3.8.1-8

3.8.1-9

3.8.1-9

- (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. 202, 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

SURVEILLANCE REQUIREMENTS

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| SR 3.8.1.1 Verify correct breaker alignment and indicated power availability for each required path. | 7 days |
| SR 3.8.1.2 -----NOTES----- 1. Performance of SR 3.8.1.6 satisfies this SR. 2. All DG starts may be preceded by an engine prelube period and followed by a warmup period prior to loading. 3. A modified DG start involving idling and gradual acceleration to synchronous speed may be used for this SR in consideration of manufacturer's recommendations. When modified start procedures are not used, the time, voltage, and frequency tolerances of SR 3.8.1.6 must be met. ----- Verify each DG starts from standby conditions and achieves steady state voltage ≥ 4084 V and ≤ 4400 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz. | 31 days |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|--|---|
| <p>SR 3.8.1.6 -----NOTE----- All DG starts may be preceded by an engine prelube period. -----</p> <p>Verify each DG starts from standby condition and achieves:</p> <ul style="list-style-type: none"> a. In ≤ 10 seconds, voltage ≥ 3740 V and frequency ≥ 58.8 Hz; and b. Steady state voltage ≥ 4084 V and ≤ 4400 V, and frequency ≥ 59.5 Hz and ≤ 60.5 Hz. | <p>184 days</p> |
| <p>SR 3.8.1.7 Verify each DG does not trip during and following a load rejection of:</p> <ul style="list-style-type: none"> 1. Unit 1 ≥ 650 kW; and 2. Unit 2 ≥ 860 kW. | <p>24 months</p> |
| <p>SR 3.8.1.8 Verify each DG's automatic trips are bypassed on an actual or simulated safety injection signal except:</p> <ul style="list-style-type: none"> a. Engine overspeed; b. Generator differential current; and c. Ground fault (Unit 1 only). | <p>-----NOTE----- SR 3.0.2 interval extension (1.25 times the interval) applies to this SR -----</p> <p>24 months</p> |

SURVEILLANCE REQUIREMENTS (continued)

| SURVEILLANCE | FREQUENCY |
|--|------------------|
| <p>SR 3.8.1.9 -----NOTES-----</p> <ol style="list-style-type: none"> 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.85. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. <p>-----</p> <p>Verify each DG operates for ≥ 24 hours:</p> <ol style="list-style-type: none"> a. For ≥ 2 hours loaded: <ul style="list-style-type: none"> Unit 1 ≥ 2832 kW, and ≤ 3000 kW Unit 2 ≥ 5400 kW, and ≤ 5940 kW; and b. For the remaining hours of the test loaded: <ul style="list-style-type: none"> Unit 1 ≥ 2500 kW, and Unit 2 ≥ 4860 kW; and c. Achieves steady state voltage ≥ 4084 V and ≤ 4400 V; and frequency ≥ 59.5 Hz and ≤ 60.5 Hz. | <p>24 months</p> |



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 214

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-42

AND AMENDMENT NO. 202

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 June 9, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14160A593), as supplemented by letter dated December 17, 2014 (ADAMS Accession No. ML14351A378), Northern States Power Company - Minnesota (NSPM, the licensee), doing business as Xcel Energy, Inc., requested changes to the technical specifications (TSs) for Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2.

The licensee proposed a revision to TS 3.8.1, "AC [Alternating Current] - OPERATING," to modify the emergency diesel generator (EDG) steady-state voltage and frequency limits as specified in TS Surveillance Requirement (SR) 3.8.1.2, SR 3.8.1.6, and SR 3.8.1.9. The licensee proposed to modify the steady-state voltage and frequency range limits to resolve non-conservative EDG load values that are currently under administrative controls. The proposed change would also improve the operation and testing of the EDGs and provide a more conservative voltage and frequency band for operation when not connected in parallel with the offsite sources.

The supplement dated December 17, 2014, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on August 5, 2014 (79 FR 45479).

2.0 REGULATORY EVALUATION

The Prairie Island Nuclear Generating Plant, Units 1 and 2, was licensed to operate prior to issuance of the regulations in Appendix A, "General Design Criteria for Nuclear Power Plants,"

to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50. PINGP was licensed on the basis of similar plant-specific principal design criteria. The PINGP Updated Safety Analysis Report (USAR), Revision 29, Section 1.5, "General Design Criteria," states that PINGP was designed and constructed to comply with the licensee's understanding of the intent of Atomic Energy Commission (AEC) General Design Criteria (GDC) for Nuclear Power Plant Construction Permits, as proposed on July 10, 1967.

PINGP USAR, Section 1.5, AEC GDC 24, "Emergency Power for Protection Systems," states that in the event of loss of all offsite power, sufficient alternate sources of power shall be provided to permit the required functioning of the protection systems. The facility is supplied with normal, reserve and emergency power to provide for the required functioning of protection systems. In the event of a reactor and turbine trip, emergency power is supplied by two EDGs per unit, as described in Section 8 of the PINGP USAR. Any one EDG is capable of supplying the emergency power requirements for that unit.

PINGP USAR, Section 1.5, AEC GDC 39, "Emergency Power for Engineered Safety Features (ESF)," states that alternate power systems shall be provided and designed with adequate independency, redundancy, capacity, and testability to permit the functioning required of the ESF. As a minimum, the onsite power system and the offsite power system shall each, independently, provide this capacity assuming a failure of a single active component in each power system. Reliability of electric power supply is insured through two independent connections to the system grid, and a redundant source of emergency power from four EDGs installed in the facility. Power to the ESF is assured even with the failure of a single active component in each system.

The regulation in 10 CFR Section 50.36 (10 CFR 50.36) includes the NRC's requirements regarding technical specifications, and specifies that TSs shall be included by applicants for a license authorizing operation of a production or utilization facility. The TSs incorporated in a license will be designed to include those significant design features, operating procedures and operating limitations which are considered important in providing reasonable assurance that the facility will be constructed and operated without undue hazard to public health and safety.

Section 50.36(c) of 10 CFR requires that TSs include items in the following five categories related to station operation. These categories are: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation; (3) SRs; (4) design features; and (5) administrative controls. The proposed changes to TS 3.8.1 are within the scope of the SRs category mentioned above.

NRC Regulatory Guide (RG) 1.9, Revision 2, dated December 1979, "Selection, Design, and Qualification of Diesel-Generator Units Used as Standby (Onsite) Electric Power Systems at Nuclear Power Plants," describes a method acceptable to the NRC staff for complying with the Commission's regulations with regard to design and testing of EDGs.

AEC Safety Guide 9, dated March 1971, "Selection of Diesel Generator Set Capacity for Standby Power Supplies" (subsequently superseded by NRC RG 1.9) described an acceptable basis for the selection of diesel generator sets of sufficient capacity and margin to implement GDC 17 when PINGP Unit 1 received its operating license in 1974.

3.0 TECHNICAL EVALUATION

3.1 Proposed Technical Specification Changes

The current minimum steady-state voltage defined in TSs is greater than or equal to (\geq) 3740 volts (V) and less than or equal to (\leq) 4580 V, and the current frequency range is \geq 58.8 Hertz (Hz) and \leq 61.2 Hz.

The licensee proposes to revise the applicable TS SRs, as described below, to specify a minimum and maximum steady state voltage of \geq 4084 V and \leq 4400 V, and a frequency range of \geq 59.5 Hz and \leq 60.5 Hz.

SR 3.8.1.2 will state the following:

Verify each DG [diesel generator] starts from standby conditions and achieves steady state voltage \geq 4084 V and \leq 4400 V, and frequency \geq 59.5 Hz and \leq 60.5 Hz.

SR 3.8.1.6 will state the following:

Verify each DG starts from standby condition and achieves:

- b. Steady state voltage \geq 4084 V and \leq 4400 V, and frequency \geq 59.5 Hz and \leq 60.5 Hz.

SR 3.8.1.9 will state:

Verify each DG operates for \geq 24 hours:

- a. For \geq 2 hours loaded:

Unit 1 \geq 2832 kW, and
 \leq 3000 kW

Unit 2 \geq 5400 kW, and
 \leq 5940 kW; and

- b. For the remaining hours of the test loaded:

Unit 1 \geq 2500 kW, and

Unit 2 \geq 4860 kW; and

- c. Achieves steady state voltage \geq 4084 V and \leq 4400 V; and frequency \geq 59.5 Hz and \leq 60.5 Hz.

3.2 NRC Staff Evaluation

The PINGP USAR, Section 8.1, states that, to satisfy AEC GDC 24 and 39, independent alternate power systems are provided with adequate capacity and testability to supply the required ESF and protection systems. There are two EDG sets dedicated to each unit which are connected to the safeguards buses to supply shutdown power in the event of loss of all other AC auxiliary power. The EDG arrangement provides adequate capacity to supply the ESF for the design-basis accident in one unit, assuming the failure of a single active component in the system. In the event of a loss-of-coolant accident (LOCA) coincident with a loss-of-offsite power (LOOP) event, emergency power is available from two EDGs dedicated to each unit.

The original plant design and construction included two Fairbanks-Morse opposed-piston EDGs for the two unit site. The two EDGs, identified as D1 and D2, are currently dedicated to Unit 1 and provide onsite standby power sources for the 4-kilovolt (kV) safeguards buses 15 and 16. The EDGs are each rated at 2750 kilowatts (kW) continuous (for 8760 hours), 0.8 power factor (PF), 900 revolutions per minute (rpm), 4160 V, 3-phase, 60 Hz. The 1000-hour rating of each EDG is 3000 kW. The 30-minute rating of each EDG is 3250 kW. It states in Section 8.4 of the PINGP USAR that the Unit 1 EDGs were sized per AEC Safety Guide 9, Paragraph C-2, which required the predicted load on the EDG to not exceed the smaller of either the 2000-hour rating or 90 percent of the 30-minute rating.

The Unit 2 EDGs, identified as D5 and D6, consist of two tandem-drive units (gensets) manufactured by Societe Alsacienne de Constructions Mecaniques de Mulhouse. The EDGs are rated at 5400 kW continuous (8760 hour basis), 0.8 PF, 1200 rpm, 4160V, 3-phase, 60 Hz. The gensets are radiator cooled, independent of the plant cooling water system. EDGs D5 and D6 meet the design and acceptance testing requirements of RG 1.9, Revision 2, except portions of the 1984 Edition of the Institute of Electrical and Electronics Engineers 387 were implemented in the factory testing instead of the 1977 revision.

In its June 9, 2014, license amendment request (LAR), the licensee proposed to narrow the existing acceptance criteria range for allowable frequency and voltage during EDG surveillance testing to avoid the potential for overloading the EDGs and to assure that safe shutdown equipment will perform as required by accident analyses. If any variation of steady-state voltage and/or frequency occurs, it could potentially affect the operating characteristics of motor-driven loads.

In an October 21, 2014, letter, the NRC staff requested the licensee provide details on the EDG steady-state loading calculations that evaluated the frequency and voltage variations during design basis events. In its December 17, 2014, response letter, the licensee stated that an engineering calculation ENG-EE-021 (which evaluated the worst-case accident loading on the EDGs) demonstrated the ability of the EDGs to perform their design function of carrying the required safeguards steady-state loads during a small-break LOCA, a large-break LOCA, and a main steam line break. Calculation ENG-EE-021 had undergone six revisions since it was previously submitted in support of PINGP Amendment Nos. 189 and 178, dated October 21, 2008 (ADAMS Accession Number ML082490441). The NRC staff also requested that the maximum postulated EDG loading (when EDGs are operating at the worst-case voltage and frequency) be verified due to loading discrepancies between the previous and current calculations and LAR submittals. The licensee stated that EDG steady-state loading for a safety

injection (SI) event concurrent with a LOOP indicates EDG D2 (Unit 1 Train B) has the least margin, and a total loading during the time interval of 30 minutes to 1 hour at 2335.06 kW, which is below the continuous rating of 2750 kW. In addition, the licensee verified the settings of safeguards bus protective relays at the proposed upper and lower voltage limits, and determined there was no challenge to relay coordination.

The licensee stated in its LAR that an analysis was performed to determine the capability of the EDGs to operate within the frequency and voltage variations and the capability of the ESF equipment, which is supplied power by the EDGs, to perform their safety functions. Calculations demonstrated that the pumps would operate acceptably, and to perform their credited design functions when EDG frequency was maintained between 59.5 and 60.5 Hz. The licensee verified that there are no concerns with motor-operated valve operation and ventilation system fan/blower operation due to the variation in EDG frequency. The licensee also verified that there was no impact on TS-required EDG fuel oil volume. Therefore, the licensee concluded that EDG operation within the new more restrictive frequency and voltage ranges will continue to maintain operability of the ESF systems required for the safe shutdown of the facility, and for mitigation and control of accident conditions when powered by the EDGs.

As indicated in the LAR, the licensee performed a degraded voltage case study that generated numerous plant configurations. The degraded voltage relay (DVR) setpoints and analyses were referenced as the bounding analyses to demonstrate operability of equipment and protective relay settings. The DVR setpoint analysis considered the safety buses to be powered from the offsite electrical power source, which generally has a higher capacity to provide the reactive power needs of plant loads compared to the onsite electrical power systems which are exciter capability limited. PINGP calculation ENG-EE-183, "Unit 1 Electrical Transient Analysis for a LOCA Concurrent with a LOOP," determined the terminal voltage of the 4-kV large motors for load sequencing during a design-basis accident. Calculation ENG-EE-183 also demonstrated that the overcurrent protection relays do not trip, which in turn does not cause the associated breakers to trip. The transient analysis also determined that the time for each motor to accelerate to breakdown speed was less than 3 seconds for each Unit 1 4-kV motor.

Calculation ENG-EE-018, "Unit 2 Diesel Generator Sequence Loading for an SI Event (LOCA) Concurrent with a LOOP", is the Unit 2 analysis. The results of the analysis demonstrate that the Unit 2 EDGs are within their transient and steady-state loading values, ensuring that the EDGs will provide the required power to the safeguards loads. This analysis also demonstrates that the EDGs are not overloaded during each load sequence step, and thus ensures the EDGs will complete the load sequence and provide power to the safeguards buses and subsequent ESF loads. In addition, an integrated SI test is performed during each refueling outage. This test simulates a SI concurrent with a LOOP. During this test, the EDG voltage is captured during the load sequencing transient. The licensee determined through recent integrated SI testing that the EDGs provide adequate voltage to start the safeguards loads under a simulated LOOP or LOCA event.

The NRC staff requested information regarding RG 1.9, Revision 4, "Application and Testing of Safety-Related Diesel Generators in Nuclear Power Plants," and actuation of DVRs during EDG load sequencing. Specifically, the staff requested confirmation that the EDGs will maintain the proposed steady-state frequency and voltage limits during load sequencing transients. The staff also requested that the licensee confirm that the DVRs will not actuate and have to be reset in

the event of a LOOP when the EDG is required to supply plant loads. The licensee stated that when the integrated SI test is performed, the EDG voltage is captured during the load sequencing transient. Recent tests demonstrate that the EDGs provide adequate voltage to start the safeguards loads under a simulated LOOP and LOCA event at the prescribed sequence intervals, thus ensuring the requirements of RG 1.9 are met for the Unit 2 EDGs and Safety Guide 9 for the Unit 1 EDGs. The licensee also stated that performance of this test has not resulted in actuation of any degraded or under voltage relays, such that the load sequencing would halt and wait for voltage at the safeguards bus to recover and allow the load sequence to continue. The licensee performed a search of its corrective action program database, and no issues associated with actuation of either DVRs or under voltage relays during an integrated SI test were found.

The NRC staff requested that the licensee verify that DVRs do not have to be reset during a LOOP event when the EDG is operating at a minimum voltage of 4084 volts alternating current (Vac) and being required to supply plant loads. The licensee stated that PINGP surveillance procedures (SP) 1218 [SP 2218] and SP 1219 [SP 2219] verify that the relay dropout and reset setpoints are within the acceptable TS limits of 94.8 percent (lower) and 96.2 percent (upper) of the nominal trip setpoint. For conservatism, the surveillance procedures include a +/- 0.2 percent calibration tolerance for the actual relay dropout and reset values. This calibration tolerance ensures that the relay dropout occurs within the TS allowance. The relays shall be recalibrated if the "as found" setting is not within the following setpoint values:

- Reset Setpoint (Test Acceptance) 96.0 percent - nominal
- Acceptance Range 95.8 percent - low limit (3985.3V /114.16V)
 96.2 percent - high limit (3993.6V /114.63V)

Based on the above, the staff considers that satisfactory performance of the aforementioned surveillance procedures ensures that the DVRs will not have to be reset during a LOOP event when the EDG is operating at the minimum voltage of 4084 Vac.

3.3 Summary

The NRC staff reviewed the licensee's proposed TS changes and supporting documentation. Based on the staff's evaluation, it was determined that the proposed amendment related to the allowable steady-state operating voltage and frequency band of the EDGs remains consistent with the recommendations of the NRC guidance in RG 1.9, Revision 3. The staff finds that the proposed changes to surveillance requirements assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Minnesota State official was notified of the proposed issuance of the amendment on May 8, 2015. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to the use of facility components located within the restricted area as defined in 10 CFR Part 20 or changes surveillance requirements. 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 finding that the amendments involve no significant hazards consideration and there has been no public comment on such finding as published in the *Federal Register* on August 5, 2014 (79 FR 45479). 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 NRC staff 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.

Principal Contributors: Robert Wolfgang, NRR
Shavon Edmonds, NRR

Date: May 21, 2015

K. Davison

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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,

/RA/

Terry A. Beltz, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-282 and 50-306

Enclosures:

1. Amendment No. 214 to DPR-42
2. Amendment No. 202 to DPR-60
3. Safety Evaluation

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* via memorandum dated March 26, 2015

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