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

February 28, 2014

Mrs. Karen D. Fili
Site Vice President
Monticello Nuclear Generating Plant
Northern States Power Company - Minnesota
2807 West County Road 75
Monticello, MN 55362-9637

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT - ISSUANCE OF AMENDMENT TO ADOPT TSTF-535, "REVISE SHUTDOWN MARGIN DEFINITION TO ADDRESS ADVANCED FUEL DESIGNS" (TAC NO. MF1468)

Dear Mrs. Fili:

The U.S. Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment No. 179 to Renewed Facility Operating License No. DPR-22 for the Monticello Nuclear Generating Plant. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated April 19, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13112A153).

The amendment approves adoption of NRC-approved Technical Specifications Task Force (TSTF) Standard Technical Specifications Change Traveler TSTF-535, Revision 0, "Revise Shutdown Margin Definition to Address Advanced Fuel Designs" (ADAMS Accession No. ML112200436), dated August 8, 2011. The amendment modifies the TS definition of "Shutdown Margin" (SDM). Specifically, the calculation of SDM is changed to a reactor moderator temperature of 68 degrees Fahrenheit (°F) or higher, and represents the most reactive state throughout the operating cycle. This change addresses newer boiling-water reactor fuel designs which may be more reactive at shutdown temperatures above 68°F.

A copy of our safety evaluation supporting this amendment request is enclosed. A Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Please contact me at (301) 415-3049 if you have any questions.

Sincerely,

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

Docket No. 50-263

Enclosures:
1. Amendment No. 179 to License No. DPR-22
2. Safety Evaluation

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

NORTHERN STATES POWER COMPANY - MINNESOTA

DOCKET NO. 50-263

MONTICELLO NUCLEAR GENERATING PLANT

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 179
License No. DPR-22

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

   A. The application for amendment by Northern States Power Company - Minnesota (NSPM) dated April 19, 2013, 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-22 is hereby amended to read as follows:

   Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 179, are hereby incorporated in the license. NSPM shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Robert D. Carlson, Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Operating
License No. DPR-22 and Technical Specifications

Date of Issuance: February 28, 2014

ATTACHMENT TO LICENSE AMENDMENT NO. 179

RENEWED FACILITY OPERATING LICENSE NO. DPR-22

DOCKET NO. 50-263

Replace the following page of Renewed Facility Operating License DPR-22 with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

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 areas of change.

REMOVE	INSERT
1.1-4	1.1-4
1.1-5	1.1-5

2. Pursuant to the Act and 10 CFR Part 70, NSPM to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operations, as described in the Final Safety Analysis Report, as supplemented and amended, and the licensee's filings dated August 16, 1974 (those portions dealing with handling of reactor fuel);

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 calibration or associated with radioactive apparatus or components; and

5. Pursuant to the Act and 10 CFR Parts 30 and 70, NSPM to possess, but not separate, such byproduct and special nuclear material as may be produced by operation of the facility.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations in 10 CFR Chapter I and 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 2004 megawatts (thermal).

2. Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 179, are hereby incorporated in the license. NSPM shall operate the facility in accordance with the Technical Specifications.

3. Physical Protection

   NSPM shall 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

1.1 Definitions

OPERABLE – OPERABILITY	A system, subsystem, division, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, division, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).
PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)	The PTLR is the unit specific document that provides the reactor vessel pressure and temperature limits, including heatup and cooldown rates, for the current reactor vessel fluence period. These pressure and temperature limits shall be determined for each fluence period in accordance with Specification 5.6.5.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 2004 MWt.
REACTOR PROTECTION SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from initiation of any RPS channel trip to the de-energization of the scram pilot valve solenoids. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.
SHUTDOWN MARGIN (SDM)	SDM shall be the amount of reactivity by which the reactor is subcritical or would be subcritical throughout the operating cycle assuming that: a. The reactor is xenon free; b. The moderator temperature is $\geq$ 68°F corresponding to the most reactive state; and c. All control rods are fully inserted except for the single control rod of highest reactivity worth, which is assumed to be fully withdrawn. With control rods not capable of being fully inserted, the reactivity worth of these control rods must be accounted for in the determination of SDM.

1.1 Definitions

STAGGERED TEST BASIS	A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER	THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.
TURBINE BYPASS SYSTEM RESPONSE TIME	The TURBINE BYPASS SYSTEM RESPONSE TIME shall be that time interval from when the main turbine trip solenoid is activated until 80% of the turbine bypass capacity is established. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 179 TO

RENEWED FACILITY OPERATING LICENSE NO. DPR-22

NORTHERN STATES POWER COMPANY - MINNESOTA

MONTICELLO NUCLEAR GENERATING PLANT

DOCKET NO. 50-263

1.0 INTRODUCTION

By application to the U.S. Nuclear Regulatory Commission (NRC) dated April 19, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13112A153), Northern States Power Company - Minnesota (NSPM, the licensee), doing business as Xcel Energy, Inc., proposed changes to the Technical Specifications (TSs) for the Monticello Nuclear Generating Plant (MNGP). Specifically, the licensee requested to adopt the NRC-approved Technical Specifications Task Force (TSTF) Standard Technical Specifications (STS) Change Traveler TSTF-535, Revision 0, "Revise Shutdown Margin Definition to Address Advanced Fuel Designs" (ADAMS Accession No. ML112200436), dated August 8, 2011.

The proposed change would revise the TS definition of shutdown margin (SDM) to require calculation of the SDM at a reactor moderator temperature of 68 degrees Fahrenheit (°F) or higher, corresponding to the most reactive state throughout the operating cycle. This change addresses newer boiling-water reactor (BWR) fuel designs which may be more reactive at shutdown temperatures above 68°F.

The licensee stated that the license amendment request is consistent with NRC-approved TSTF-535. The availability of this TS improvement was announced in the *Federal Register* on February 26, 2013 (78 FR 13100), as part of the consolidated line item improvement process. The licensee further stated in its application that this license amendment request had no impact on either the Extended Power Uprate or Maximum Extended Load Line Limit Analysis Plus license amendment requests currently under NRC staff review.

2.0 REGULATORY EVALUATION

2.1 Background

In water-moderated reactors, water is used to slow down, or moderate, high energy fast neutrons to low energy thermal neutrons through multiple scattering interactions. The low

energy thermal neutrons are much more likely to cause fission when absorbed by the fuel. However, not all of the thermal neutrons are absorbed by the fuel; a portion of them are instead absorbed by the water moderator. The amount of moderator and fuel that is present in the core heavily influences the fractions of thermal neutrons that are absorbed in each.

Water-moderated reactors are designed such that they tend to operate in what is known as an under-moderated condition. In this condition, the ratio of the moderator-to-fuel in the core is small enough that the overall effectiveness of water as a moderator decreases with increasing temperature; fewer neutrons are absorbed in the moderator due to the decrease in its density, but this is overshadowed by the reduction in the number of neutrons that moderate from high fission energy to the lower energy level needed to cause fission. The result is a decrease in power and temperature: a negative reactivity feedback effect where the reactor becomes self-regulating. However, if the amount of moderator becomes too large with respect to the amount of fuel, the reactor can enter an over-moderated condition. In this condition, the overall effectiveness of water as a moderator increases with increasing temperature; the reduction in the number of neutrons absorbed in the moderator outweighs the loss in neutrons reaching lower energies. This causes an increase in power that leads to a further increase in temperature creating a potentially dangerous positive reactivity feedback cycle.

As practical examples in support of the proposed changes to the definition of SDM, TSTF-535 discussed SDM with regards to GE14 [General Electric 14] and GNF2 [Global Nuclear Fuel 2] fuel assemblies. TSTF-535 indicated that for historical fuel products through GE14, the maximum reactivity condition for SDM always occurred at a moderator temperature of 68°F because these fuel products were designed so that the core is always under-moderated when all control rods are inserted, except for the single most reactive rod. In cores with GNF2 fuel, TSTF-535 projected that the maximum reactivity condition at beginning of cycle (BOC) will remain at 68°F, but that later in the cycle the most limiting SDM may occur at a temperature greater than this, indicating that with this fuel design the core could potentially achieve an over-moderated condition.

The licensee states that, "NSPM has concluded that the justifications presented in the TSTF-535, Revision 0, and the model safety evaluation prepared by the NRC staff are applicable to MNGP, and justify this amendment for the incorporation of the changes into the MNGP TS." The licensee further states that, "NSPM is not proposing any variations or deviations from the TS changes described in TSTF-535, Revision 0, or the applicable parts of the NRC staff's model safety evaluation dated February 19, 2013."

2.2 Technical Specification Changes

The licensee proposed to revise the TS definition of SDM to require calculation of SDM at the reactor moderator temperature corresponding to the most reactive state throughout the operating cycle (68°F or higher).

The current definition of SDM in Section 1.1, "Definitions," of the MNGP TS is:

> SDM shall be the amount of reactivity by which the reactor is subcritical or would be subcritical assuming that:

a. The reactor is xenon free;

b. The moderator temperature is 68°F; and

c. All control rods are fully inserted except for the single control rod of highest reactivity worth, which is assumed to be fully withdrawn. With control rods not capable of being fully inserted, the reactivity worth of these control rods must be accounted for in the determination of SDM.

The licensee proposes the following changes (shown in **bold underline**) to the definition of SDM in accordance with TSTF-535:

> SDM shall be the amount of reactivity by which the reactor is subcritical or would be subcritical **throughout the operating cycle** assuming that:
>
> a. The reactor is xenon free
>
> b. The moderator temperature is ≥ 68°F, **corresponding to the most reactive state**; and
>
> c. All control rods are fully inserted except for the single control rod of highest reactivity worth, which is assumed to be fully withdrawn. With control rods not capable of being fully inserted, the reactivity worth of these control rods must be accounted for in the determination of SDM.

2.3 Regulatory Review

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix A, General Design Criteria (GDC) 26, "Reactivity control system redundancy and capability," and GDC 27, "Combined reactivity control systems capability," respectively require that reactivity within the core be controllable to ensure subcriticality is achievable and maintainable under cold conditions, with appropriate margin for stuck rods; and that reactivity within the core be controllable to assure that under postulated accident conditions and with appropriate margin for stuck rods the capability to cool the core is maintained.

Among other things, 10 CFR 50.36(c)(2)(ii)(B) *Criterion 2*, requires the establishment of a limiting condition for operation (LCO) for a process variable, design feature, or operating restriction that is an initial condition of a design-basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. The TS definition of SDM and the LCOs placed on SDM serve, in part, to satisfy GDCs 26 and 27 by ensuring there is always sufficient negative reactivity worth available to offset the positive reactivity worth of changes in moderator and fuel temperature, the decay of fission product poisons, the failure of a control rod to insert, and reactivity insertion accidents. Given this margin, the core can be held subcritical for conditions of normal operation, including anticipated operational occurrences.

Since MNGP is a pre-GDC unit, the licensee's application provides the following plant-specific information equivalent to the GDCs discussed above:

> MNGP was designed largely before the publishing of the 70 GDCs for Nuclear Power Plant Construction Permits proposed by the Atomic Energy Commission (AEC) for public comment in July 1967, and constructed prior to the publication of 10 CFR 50, Appendix A, GDC in 1971. As such, MNGP was not licensed to the Appendix A, GDC.

The licensee further stated:

> The MNGP USAR [Updated Safety Analysis Report], Section 1.2, lists the Principal Design Criteria (PDC) for the design, construction and operation of the plant. MNGP USAR Appendix E provides a plant comparative evaluation to the 70 proposed AEC design criteria. It was concluded that the plant conforms to the intent of the GDC. The applicable GDC and PDC associated with reactivity control are discussed below:

- PDC 1.2.2 - Reactor Core

  e. The reactor core is designed so that control rod action, with the maximum worth control rod fully withdrawn and unavailable for use, is capable of bringing the reactor core subcritical and maintaining it so from any power level in the operating cycle.

  i. The reactor core and associated systems are designed to accommodate plant operational transients or maneuvers which might be expected without compromising safety and without fuel damage.

In its application, the licensee stated:

> The applicable 70 Draft AEC General Design Criteria (AEC-GDC) are:

- Criterion 28 - Reactivity Hot Shutdown Capability (Category A)

  At least two of the reactivity control systems provided shall independently be capable of making and holding the core subcritical from any hot standby or hot operating condition, including those resulting from power changes, sufficiently fast to prevent exceeding acceptable fuel damage limits.

- Criterion 29 - Reactivity Shutdown Capability (Category A)

  At least one of the reactivity control systems provided shall be capable of making the core subcritical under any condition (including anticipated operational transients) sufficiently fast to prevent exceeding acceptable fuel damage limits. Shutdown margins greater than the maximum worth of the most efficient control rod when fully withdrawn shall be provided.

- Criterion 30 - Reactivity Holddown Capability (Category B)

  At least one of the reactivity control systems provided shall be capable of making and holding the core subcritical under any conditions with appropriate margins for contingencies.

As discussed in the model safety evaluation (SE) for TSTF-535, Revision 0, the following 10 CFR 50, Appendix A, General Design Criteria are applicable.

- General Design Criterion 26 - Reactivity control system redundancy and capability.

  Two independent reactivity control systems of different design principles shall be provided. One of the systems shall use control rods, preferably including a positive means for inserting the rods, and shall be capable of reliably controlling reactivity changes to assure that under conditions of normal operation, including anticipated operational occurrences, and with appropriate margin for malfunctions such as stuck rods, specified acceptable fuel design limits are not exceeded. The second reactivity control system shall be capable of reliably controlling the rate of reactivity changes resulting from planned, normal power changes (including xenon burnout) to assure acceptable fuel design limits are not exceeded. One of the systems shall be capable of holding the reactor core subcritical under cold conditions.

- General Design Criterion 27- Combined reactivity control systems capability

  The reactivity control systems shall be designed to have a combined capability, in conjunction with poison addition by the emergency core cooling system, of reliably controlling reactivity changes to assure that under postulated accident conditions and with appropriate margin for stuck rods the capability to cool the core is maintained.

In accordance with the model SE, GDCs 26 and 27 require that reactivity within the core be controllable to ensure subcriticality is achievable and maintainable under cold conditions, with appropriate margin for stuck rods; and that reactivity within the core be controllable to assure that under postulated accident conditions and with appropriate margin for stuck rods the capability to cool the core is maintained. The proposed revisions are acceptable and will provide a conservative and improved approach to the calculation of SDM that ensures use of the appropriate limiting conditions for all fuel types at any time in the life of the core, and ensure compliance with GDCs 26 and GDC 27.

NSPM evaluated the proposed changes against the applicable regulatory requirements and acceptance criteria, and the license's technical analysis concluded that the proposed TS changes will continue to assure that the design requirements and acceptance criteria for MNGP are met.

The NRC's guidance for the format and content of licensee TSs can be found in NUREG-1434, "Standard Technical Specifications (STS) General Electric BWR/6 Plants, April 2002 (ADAMS Accession No. ML12104A195).

Revision 3 of NUREG-0800, Standard Review Plan (SRP) for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 4.3, "Nuclear Design," dated March 2007 (ADAMS Accession No. ML070740003), provides the procedures concerning the review of control systems and SDM to help ensure compliance with GDCs 26 and 27.

3.0 TECHNICAL EVALUATION

3.1 Current Definition of Shutdown Margin

In BWR plants, the control rods are used to hold the reactor core subcritical under cold conditions. The control rod negative reactivity worth must be sufficient to ensure the core is subcritical by a margin known as the SDM. It is the additional amount of negative reactivity worth needed to maintain the core subcritical by offsetting the positive reactivity worth that can occur during the operating cycle due to changes in moderator and fuel temperature, the decay of fission product poisons, the failure of a control rod to insert, and reactivity insertion accidents. Specifically, Section 1.1, "Definitions," of the STS defines SDM as the amount of reactivity by which the reactor is subcritical or would be subcritical assuming that (1) the reactor is xenon free, (2) the moderator temperature is 68°F, and (3) all control rods are fully inserted except for the rod of highest worth, which is assumed to be fully withdrawn.

The three criteria provided in the definition help exemplify what has traditionally been the most reactive design condition for a reactor core. Xenon is a neutron poison produced by fission product decay and its presence in the core adds negative reactivity worth. Assuming the core is xenon free removes a positive reactivity offset and is representative of fresh fuel at the BOC. The minimum temperature the reactor moderator is anticipated to experience is 68 °F, making it the point at which the moderator will be at its densest and therefore capable of providing the highest positive reactivity worth. By assuming the highest worth rod is fully withdrawn, the core can be designed with adequate SDM to ensure it remains safely shutdown even in the event of a stuck control rod, as required by GDCs 26 and 27.

Determination of the SDM under the aforementioned conditions yields a conservative result that, along with the requirements set forth in Section 3.1.1 of the TS, helps ensure:

a. the reactor can be made subcritical from all operating conditions and transients and design basis events,

b. the reactivity transients associated with postulated accident conditions are controllable within acceptable limits, and

c. the reactor will be maintained sufficiently subcritical to preclude inadvertent criticality in the shutdown condition.

3.2 Proposed Definition of Shutdown Margin

The specified moderator temperature of 68°F facilitates the maximum reactivity condition only if the core exists in an under-moderated condition. In addition to burnable poisons, many modern fuel designs also incorporate partial length rods for increased neutron economy which are employed in order to extend the operating cycle. Both of these affect the ratio of moderator to fuel. The strong local absorption effects of the burnable poisons in fresh fuel make the core under-moderated. As burnable poisons are depleted during the fuel cycle, the core becomes less under-moderated, potentially leading to a slightly over-moderated condition wherein the core will be more reactive at a moderator temperature higher than the 68°F specified in the SDM definition. Thus, the maximum core reactivity condition and the most limiting SDM may occur later in the fuel cycle at a temperature greater than 68°F. Consequently, calculation of the SDM at the currently defined moderator temperature of 68°F may not accurately determine the available margin.

TSTF-535 therefore proposed a change to the definition of SDM to enable calculation of the SDM at a reactor moderator temperature of 68°F or higher, corresponding to the most reactive state throughout the operating cycle. SDM would be calculated using the appropriate limiting conditions for all fuel types at any time in core life.

In support of the proposed change, TSTF-535 cited the requirements for SDM as specified in Topical Report NEDO-24011-A, Revision 18, "General Electric Standard Application for Reactor Fuel (GESTAR II)," dated April 2011 (ADAMS Accession No. ML111120046).

Section 3.2.4.1 of GESTAR II states:

> The core must be capable of being made subcritical, with margin, in the most reactive condition throughout the operating cycle with the most reactive control rod fully withdrawn and all other rods fully inserted.

The Traveler also cited Standard Review Plan (SRP) Section 4.3, which states the following concerning the review of control systems and SDM:

> The adequacy of the control systems to assure that the reactor can be returned to and maintained in the cold shutdown condition at any time during operation. The applicant shall discuss shutdown margins (SDM). Shutdown margins need to be demonstrated by the applicant throughout the fuel cycle.

Although the licensing basis requirements for SDM in GESTAR II are only applicable for cores licensed with Global Nuclear Fuels methods, they are consistent with the review procedures set forth in the SRP, which are provided to help ensure compliance with GDCs 26 and 27.

TSTF-535 stated that while the SRP does not prescribe the temperature at which the minimum SDM should be determined, the requirement of shutting down the reactor and maintaining it in a shutdown condition "at any time during operation" suggests that considering a range of thermal and exposure conditions would be appropriate in the determination of the minimum SDM. Because newer fuel designs employ elements such as partial length rods and burnable absorbers, which may cause the maximum core reactivity conditions and the most limiting SDM

to occur later in the fuel cycle at a temperature greater than 68°F, the NRC staff agrees with the TSTF-535 assessment in this regard. Additionally, the NRC staff finds that allowing calculation of the SDM at the most limiting core reactivity condition is prudent with respect to ensuring compliance with GDCs 26 and 27 or their plant-specific equivalent, and concludes that the proposed changes to the MNGP TSs are acceptable.

The impetus for TSTF-535 was to provide for a more broadly applicable SDM definition in recognition of modern fuel designs, for which the core may not be in its most reactive condition at 68°F. The proposed language will require the licensee to consider all temperatures equal to or exceeding 68°F, and at all times during the operating cycle. This change places an additional responsibility on the licensee to identify the most limiting time-in-cycle and temperature, a change that is more conservative than the current definition, and will ensure that the licensee maintains adequate SDM as required by its current licensing basis. Therefore, the change is acceptable for MNGP. The NRC staff also finds that the revised definition is consistent with the 10 CFR 50.36 requirements pertaining to LCOs, because it ensures that the LCOs for SDM consider a broadly conservative range of potential initial conditions in the anticipated operational occurrence analyses.

3.3 SUMMARY

The NRC staff reviewed the licensee's request to implement TSTF-535 and the proposed revisions to the definition of SDM. Based on the considerations discussed above, the NRC staff concludes that the proposed revisions are acceptable and will provide a conservative and improved approach to the calculation of SDM that ensures use of the appropriate limiting conditions for all fuel types at any time in the life of the core. The NRC staff concludes that the proposed revisions serve to satisfy the requirements set forth in GDCs 26 and GDC 27, or MNGP's equivalent, as discussed in NUREG-0800, Section 4.3, "Nuclear Design." Additionally, the NRC staff concludes that the proposed changes to the definition of SDM will require the licensee to calculate SDM in consideration of the most limiting conditions in the core. Therefore, the revised SDM definition is acceptable for facilities using any current fuel design, including MNGP.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATIONS

This amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes a surveillance requirement. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent 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 amendment involves no significant hazards consideration and there has been no public comment on such finding as published in the *Federal Register* on September 3, 2013 (78 FR 54285). Accordingly, the amendment meets 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 amendment.

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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: R. Grover, NRR/DSS/STSB

Date: February 28, 2014

Please contact me at (301) 415-3049 if you have any questions.

Sincerely,

/RA/

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

Docket No. 50-263

Enclosures:
1. Amendment No. 179 to License No. DPR-22
2. Safety Evaluation

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ADAMS Accession No.: ML14027A232 * Safety evaluation transmitted by memo dated 12/03/13

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