Monticello Nuclear Generating Plant
2807 W County Rd 75
Monticello, MN 55362

April 29, 2016

L-MT-16-017
10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Monticello Nuclear Generating Plant
Docket 50-263
Renewed License No. DPR-22

Revised Commitment to Reconcile Analysis of Bypass Voiding
For Transition to AREVA Analysis Methodology (TAC No. MF5002)

References:
1) Letter from Karen D. Fili (NSPM), to Document Control Desk (NRC), "License Amendment Request for AREVA Extended Flow Window," L-MT-14-044, dated October 3, 2014 (ADAMS Accession No. ML14283A125)
2) Letter from Timothy J. O'Connor (NSPM), to Document Control Desk (NRC), "Monticello Extended Power Uprate: Response to NRC Reactor Systems Branch and Nuclear Performance & Code Review Branch Request for Additional Information (RAI) dated January 16, 2009 (TAC No. MD9990)," L-MT-09-017, dated March 19, 2009 (ADAMS Accession No. ML090790388)

In Reference 1, Northern States Power Company, a Minnesota corporation (NSPM) doing business as Xcel Energy, requested approval of an amendment to the Monticello Nuclear Generating Plant (MNGP) Renewed Operating License (OL) and Technical Specifications (TS). The proposed change would revise the MNGP TS and would approve certain analytical methods that together would support operation in the expanded power-flow operating domain described as the Extended Flow Window (EFW). The purpose of the requested amendment is to transition from the General Electric – Hitachi (GEH) methodology called Maximum Extended Load Line Limit Analysis Plus (MELLLA+) to the AREVA methodology called EFW.

In Reference 2, during review of the Extended Power Uprate (EPU) amendment request, NSPM made a commitment to use particular GEH calculational methods to determine steady state bypass void fraction.

The purpose of this letter is to revise the commitment made in Reference 2 so that it may be reconciled with the AREVA calculational methodology that was approved by MNGP License Amendment 188 and confirmed pursuant to the Reference 1 License Amendment Request. The commitment change is justified because it perpetuates the bypass void fraction analysis, but invokes the approved AREVA methodology in place of the GEH methodology.

The commitment revision will become effective for core reload analyses performed by AREVA, which will be implemented at startup for Operating Cycle 29 in 2017.

The enclosure to this letter describes the particular AREVA calculational methodology that will be used for determining steady state bypass void fraction.

The information offered herein does not affect the conclusions of the No Significant Hazards Consideration and the Environmental Consideration evaluations provided in the Reference 1 license amendment request.

In accordance with 10 CFR 50.91(b), a copy of this letter is being provided to the designated Minnesota Official.

If there are any questions or if additional information is needed, please contact Glenn Adams at 612-330-6777.

Summary of Commitments

This letter makes the following revised commitment:

Revised Regulatory Commitment	Due Date / Event
The steady state bypass void fraction for the EPU core will be calculated using the method described by NSPM letter to NRC L-MT-16-017, dated April 29, 2016.	Effective for reactor core reload analyses that will be implemented at startup for operating cycle 29 in 2017.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: April 29, 2016

Peter A. Gardner
Site Vice President
Monticello Nuclear Generating Plant
Northern States Power Company-Minnesota

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Monticello Nuclear Generating Plant, USNRC
Resident Inspector, Monticello Nuclear Generating Plant, USNRC
Minnesota Department of Commerce (w/o enclosure)

BYPASS VOID FRACTION COMMITMENT CHANGE

Background

In Reference 1, Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy provided a license amendment request (LAR) for the Monticello Nuclear Generating Plant (MNGP). The Reference 1 LAR requested approval to increase the maximum authorized power level from 1775 megawatts thermal (MWt) to 2004 MWt, called an extended power uprate (EPU).

In Reference 2, NSPM provided a response to NRC requests for additional information (RAIs). As part of the response to RAI SNPB-7, NSPM made the following commitment:

> *The steady state bypass void fraction for the EPU core will be calculated using the method described by the NSPM response to NRC RAI SNPB-7 of L-MT-09-017.*

In response to NRC RAI SNPB-7, NSPM described the calculation process for determining the steady state bypass void fraction. The process included General Electric-Hitachi (GEH) methodologies ISCOR and TRACG to verify that the bypass void fraction remains below 5% at Local Power Range Monitor (LPRM) levels when operating at steady-state conditions within the licensed operating domain. The bypass void fraction is calculated to validate that the void fraction does not exceed the void fraction assumed in the LPRM service limitations.

In Reference 3, the NRC approved the MNGP EPU. The commitment was met by updating NSPM core reload design procedures to require that the GEH core design include a verification that the bypass void fraction remains below 5% at LPRM levels when operating at steady-state conditions.

Discussion

In Reference 4, the NRC approved use of AREVA ATRIUM 10XM fuel for MNGP. As part of the transition to AREVA fuel, AREVA core reload methodologies will be employed. AREVA methods do not utilize ISCOR or TRACG. Therefore, the commitment requires modification. NSPM has not implemented use of AREVA core reload methodologies because no AREVA fuel is installed in the MNGP core.

NSPM proposes to continue to meet the requirement that the bypass void fraction remains below 5% at LPRM levels when operating at steady-state conditions. However, AREVA methods will be used to determine bypass void fraction as described further below in a structure that is similar to the original commitment.

Commitment:

The conservative means of determining void fraction using AREVA methods is with the multiple channel bypass option in MICROBURN-B2. This model assigns a bypass channel to each of the active fuel channels. The heat deposition to each bypass channel is determined by the associated active fuel channel. The cross flow between different bypass channels is ignored. The standard pressure drop model used for the active fuel is applied to each bypass channel.

The void fraction at the LPRM level is determined by averaging the void fraction of the four bypass channels associated with the LPRM detector location and typically demonstrates margin to the 5% bypass void fraction requirement at the uppermost LPRM Level.

For each MNGP reload core, a calculation will be performed at the current licensed thermal power (CLTP)[1] and anticipated core flows throughout the cycle (the bypass void fraction is not very sensitive to the core flow due to the compensation in inlet enthalpy for reduced flows). The purpose of the calculation is to confirm that the bypass void fraction remains below 5 percent at all LPRM levels when operating at steady state conditions within the licensed operating domain.

If the resulting bypass void fraction at any LPRM level is found to exceed the 5% requirement, it is acceptable to utilize the multi-channel bypass model where the energy and mass are combined among neighboring fuel assemblies. The acceptance criterion using the multi-channel bypass model is to not exceed 5% bypass void fraction.

The highest calculated bypass voiding at any LPRM level will be provided with the plant-specific Reload Licensing Report.

Conclusion

Based on the above, NSPM is modifying the commitment to verify the bypass void fraction remains below 5% at LPRM levels when operating at steady-state conditions. The acceptance criterion used to verify the bypass void fraction will not be modified, only the methodologies used to determine the bypass void fraction will be modified. This modification is necessary as NSPM is moving from GEH methodologies for core reload design to AREVA methodologies.

References:

1. Letter from Timothy J. O'Connor (NSPM), to Document Control Desk (NRC), "License Amendment Request: Extended Power Uprate (TAC MD9990)," L-MT-08-052, dated November 5, 2008 (ADAMS Accession No. ML083230111)

[1] CLTP now represents EPU conditions.

2. Letter from Timothy J. O'Connor (NSPM), to Document Control Desk (NRC), "Monticello Extended Power Uprate: Response to NRC Reactor Systems Branch and Nuclear Performance & Code Review Branch Request for Additional Information (RAI) dated January 16, 2009 (TAC No. MD9990)," L-MT-09-017, dated March 19, 2009 (ADAMS Accession No. ML090790388)
3. Letter from T. Beltz (NRC) to K. Fili (NSPM), Subject: Monticello Nuclear Generating Plant - Issuance of Amendment No. 176 to Renewed Facility Operating License Regarding Extended Power Uprate (TAC No. MD9990), dated December 9, 2013. (ADAMS Accession No. ML13316B298)
4. Letter from T. Beltz (NRC) to P. Gardner (NSPM), Subject: Monticello Nuclear Generating Plant - Issuance of Amendment to Transition to AREVA ATRIUM 10XM Fuel and AREVA Safety Analysis Methods (TAC No. MF2479), dated June 5, 2015. (ADAMS Accession No. ML15072A141)