



February 8, 2013

L-PI-13-002
10 CFR 50.90

U.S. Nuclear Regulatory Commission
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Prairie Island Nuclear Generating Plant, Units 1 and 2
Dockets 50-282 and 50-306
Renewed License Nos. DPR-42 and DPR-60

Response to Request for Additional Information (RAI) Associated with Spent Fuel Pool Criticality Changes (TAC Nos. ME6984 and ME6985)

In a letter to the U.S. Nuclear Regulatory Commission (NRC) dated August 19, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11236A133), the Northern States Power Company, a Minnesota corporation doing business as Xcel Energy (hereafter "NSPM"), requested an amendment to the Technical Specifications (TS) regarding Spent Fuel Pool (SFP) criticality for the Prairie Island Nuclear Generating Plant (PINGP).

To complete their review, the NRC staff requested additional information by letter dated January 22, 2013 (ADAMS Accession No. ML13011A316). Enclosure 1 to this letter provides the NSPM response to the January 22, 2013 request for additional information.

NSPM submits this supplement in accordance with the provisions of 10 CFR 50.90.

The supplemental information provided in this letter does not impact the conclusions of the Determination of No Significant Hazards Consideration and Environmental Assessment presented in the August 19, 2011 submittal.

In accordance with 10 CFR 50.91, NSPM is notifying the State of Minnesota of this License Amendment Request (LAR) supplement by transmitting a copy of this letter to the designated State Official.

Summary of Commitments

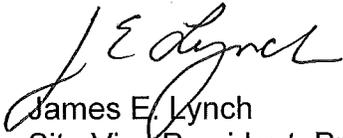
This letter revises commitment number 2 listed in Enclosure 7 of the original LAR. The revised commitment reads as follows:

2. In conjunction with implementation of the proposed TS, procedures will be revised to require an assessment of a fuel assembly's exposure to rodged power operation in

the core prior to moving that fuel assembly into the spent fuel pool (SFP) storage racks. If an assembly experiences more than 100 megawatt days per metric ton uranium (MWd/MTU) of core average full-power rodded operation exposure in the cycle immediately prior to discharge to the spent fuel pool, this exposure experienced while rodded will not be credited for determining the coefficients used to categorize fuel assemblies as described in WCAP-17400-P. In addition, if an assembly experiences more than 1 gigawatt day per metric ton uranium (GWd/MTU) of core average rodded operation lifetime exposure, the assembly shall either be treated as Fuel Category 1 or evaluated to determine which Fuel Category is appropriate for safe storage of the assembly.

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

Executed on 2/8/13



James E. Lynch
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota

Enclosure

cc: Regional Administrator, Region III, USNRC
Project Manager, Prairie Island Nuclear Generating Plant, USNRC
Resident Inspector, Prairie Island Nuclear Generating Plant, USNRC
State of Minnesota (without enclosure)

ENCLOSURE 1

Spent Fuel Pool Criticality Analysis Response to Requests for Addition Information (RAI)

In a letter to the U.S. Nuclear Regulatory Commission (NRC) dated August 19, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11236A133), the Northern States Power Company, a Minnesota corporation doing business as Xcel Energy (hereafter "NSPM"), requested an amendment to the Technical Specifications (TS) regarding Spent Fuel Pool (SFP) criticality for the Prairie Island Nuclear Generating Plant (PINGP).

To complete their review, the NRC staff requested additional information by letter dated January 22, 2013 (ADAMS Accession No. ML13011A316).

For clarity, the NRC RAI information is provided below in italics font and the NSPM response is provided in plain font.

- (1) *Regarding the sensitivity analysis provided in response to RAI-SRXB-1 in the May 16, 2012, submittal, please confirm whether the un-poisoned cases assumed a uniform U-235 enrichment loading across all pins at the U-235 enrichments analyzed.*

Response: All un-poisoned cases used in the sensitivity analysis provided in response to RAI-SRXB-1 assumed a uniform U-235 enrichment loading across all pins at the values of enrichment presented in the May 16, 2012 submittal.

- (2) *Confirm that the actual fuel assemblies at PINGP contain lower enrichments in Gd-bearing pins.*

Response: In every cycle of operation except Unit 1 Cycle 5, the U-235 enrichment of the gadolinia bearing pins is lower than the pins without gadolinia. In Unit 1 Cycle 5, the gadolinia bearing pins were of the same enrichment as the pins without gadolinia. This was the first cycle of operation using gadolinia and the gadolinia enrichment was only 1 weight percent. Note that even in Unit 1 Cycle 5, the gadolinia bearing pins contain fewer grams of U-235 than the pins without gadolinia because the gadolinia displaces uranium in the fuel matrix.

- (3) *It is not clear from Section 3.3.3.1 of WCAP-17400-P, enclosed in the August 19, 2011, application, if the database used to determine the axial burnup profile considered extended power uprate (EPU) cycle designs. Please confirm whether operation in an EPU cycle has been considered in determining the limiting axial shape.*

Response: NSPM confirms that EPU fuel management cycles were reviewed and considered in selecting the limiting axial burnup profiles. A thorough review of the

uprate fuel management calculations was performed including the axial burnup profiles associated with the uprate fuel management studies and it was concluded that the uprate fuel axial burnup profiles do not need to be explicitly included in the criticality safety analysis.

Notwithstanding the above, as discussed in a telephone conference on December 19, 2012, NSPM has decided to withdraw consideration of the EPU fuel management cycles from the proposed criticality safety analysis. NSPM has chosen to not submit a license amendment request to increase its licensed thermal power limit in conjunction with an EPU. Therefore, NSPM requests that NRC withdraw consideration of the EPU axial burnup profiles from the proposed criticality safety analysis.

- (4) *The licensee's criticality analysis provides some assurance that the proposed design basis analysis bounds previous rodded operation of up to 1 gigawatt day per metric ton uranium (GWD/MTU) of depletion. However, since future rodded operation could initiate at or near the other depletion parameters in the proposed design basis analysis, the analysis does not bound future operation. Therefore, the NRC staff requests that the licensee either:*
- (a) *Provide an analysis for rodded operation that initiates from the other depletion parameters used in the proposed design basis analysis, or*
 - (b) *Propose an alternate method of controlling fuel assemblies that have experienced rodded operation.*

Response: For all assemblies discharged into the spent fuel pool after approval of this license amendment request, NSPM proposes the following alternate method of controlling fuel assemblies that have experienced full-power rodded operation:

Any fuel assembly that experiences more than 100 MWD/MTU of core average full-power rodded operation exposure in the cycle immediately prior to discharge to the spent fuel pool will not be permitted to credit any full-power rodded exposure experienced during that cycle (i.e., that burnup will not be credited when determining the coefficients used to categorize fuel assemblies as described in WCAP-17400-P).

This threshold is applied only to the cycle immediately prior to discharge. Any rodded operation experienced in a previous cycle of operation will not be applied because subsequent operation in an unrodded condition will mitigate the impacts of rodded operation (i.e., axial burnup profiles tend to return to that of an equivalently burned unrodded assembly as well as the reactivity changes due to fission products as a result of spectral hardening while rodded).

To address this alternate method of controlling fuel assemblies that have experienced rodded operation, NSPM has modified Commitment 2 as follows:

2. In conjunction with implementation of the proposed TS, procedures will be revised to require an assessment of a fuel assembly's exposure to rodded power operation in the core prior to moving that fuel assembly into the spent fuel pool (SFP) storage racks. If an assembly experiences more than 100 megawatt day per metric ton uranium (MWd/MTU) of core average full-power rodDED operation exposure in the cycle immediately prior to discharge to the spent fuel pool, this exposure experienced while rodDED will not be credited for determining the coefficients used to categorize fuel assemblies as described in WCAP-17400-P. In addition, if an assembly experiences more than 1 gigawatt day per metric ton uranium (GWd/MTU) of core average rodDED operation lifetime exposure, the assembly shall either be treated as Fuel Category 1 or evaluated to determine which Fuel Category is appropriate for safe storage of the assembly.