



MAY 4 2009

L-PI-09-065  
10 CFR 50.90

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

Prairie Island Nuclear Generating Plant Units 1 and 2  
Dockets 50-282 and 50-306  
License Nos. DPR-42 and DPR-60

Supplemental Information Regarding License Amendment Request For Technical Specifications Changes To Allow Use Of Westinghouse 0.422-Inch OD 14x14 Vantage+ Fuel (TAC Nos. MD9142 and MD9143)

Reference: Letter from M. Wadley (NMC) to Document Control Desk (NRC), L-PI-08-047, "License Amendment Request for Technical Specifications Changes to Allow Use of Westinghouse 0.422-inch OD 14x14 VANTAGE+ Fuel," dated June 26, 2008 (ADAMS Accession No. ML081820137)

By letter dated June 26, 2008 (Reference), Nuclear Management Company, LLC, (now Northern States Power, a Minnesota corporation (NSPM)) requested approval of amendments to the Operating Licenses and associated Technical Specifications (TS) for Prairie Island Nuclear Generating Plant (PINGP or "Prairie Island"), Units 1 and 2, as well as certain supporting analyses, in support of the transition from Westinghouse 0.400-inch outer diameter (OD) VANTAGE+ (hereinafter referred to as 400V+) fuel to 0.422-inch OD VANTAGE+ (hereafter referred to as 422V+) fuel.

Westinghouse has subsequently notified NSPM of an issue with the use of its Advanced Nodal Code (ANC-8) that underpredicted the return to power for Main Steam Line Break (MSLB) events. The issue creates no operability concern for PINGP because Westinghouse has performed calculations (considering the ANC-8 underprediction) to show that Units 1 & 2 MSLB analysis results continue to meet acceptance criteria for current cycles using available shutdown margins of the Core Operating Limit Report (COLR). However, ANC-8 did form the basis for analyses supporting the subject License Amendment Request, which had been submitted prior to the discovery of the ANC issue. The discovered non-conservatism affects the value of the target shutdown margin assumed for representative cores. This value is provided in Table 3-1 of Enclosure 1 Attachment 4 of Reference 1.

For the representative transition cores described in the License Amendment Request's Licensing Report (Enclosure 1, Attachment 4), the target shutdown margin for the Main Steam Line Break Containment Integrity Analysis was previously assumed to be 1.7%  $\Delta\rho$ . In practice, this target value is a minimum shutdown margin requirement that is confirmed and implemented on a cycle-specific basis. To provide acceptable results for the MSLB with the corrected error to ANC-8 will require an increase in the target value of shutdown margin from

1.7%  $\Delta\rho$  to 1.9%  $\Delta\rho$ . Although 1.7%  $\Delta\rho$  shutdown margin was originally credited in Containment Analyses, the representative core loading plans presented in Section 3.4 of the licensing report had already been confirmed to have at least 1.9%  $\Delta\rho$  (as noted in Table 3-1) due to the Unit 2 steam generator design. Therefore, the impacts of this new cycle-specific target shutdown margin remain unchanged and core designs meeting the 1.9%  $\Delta\rho$  requirement continue to be achievable. To assure the licensing report is accurately represented on the docket, Table 3-1 and Section 5.4.1.2.2 should be revised from 1.7%  $\Delta\rho$  to 1.9%  $\Delta\rho$  as indicated in Attachment 1 of this letter.

With these changes, the conclusions of the licensing report remain unchanged.

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 June 26, 2008 submittal as supplemented by letters dated August 4, 2008, August 26, 2008, November 14, 2008, January 30, 2009, February 20, 2009, and March 12, 2009.

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

#### Summary of Commitments

This letter makes no new commitments and no revisions to existing commitments.

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

Executed on: MAY 4 2009

  
Michael D. Wadley  
Site Vice-President  
Prairie Island Nuclear Generating Plant  
Northern States Power Company-Minnesota

Attachment 1: Revised Affected License Amendment Request Licensing Report Pages

cc: Administrator, Region III, USNRC  
Project Manager, Prairie Island, USNRC  
Resident Inspector, Prairie Island, USNRC  
State of Minnesota

**ENCLOSURE**

REVISED AFFECTED LICENSE AMENDMENT REQUEST LICENSING REPORT PAGES

2 Pages Follow

<b>Table 3-1 Key Safety Parameters</b>		
<b>Safety Parameter</b>	<b>All 400V+</b>	<b>All 422V+</b>
Reactor Core Power (MWt)	1,683	1,683
Core Average Coolant Temperature Hot Full-Power (HFP) (°F)	563.3	563.3
Coolant System Pressure (psia)	2,250	2,250
Most Positive Isothermal Temperature Coefficient (ITC) (pcm/°F)	0	0
Most Positive Moderator Density Coefficient (MDC) ( $\Delta K/g/cm^3$ )	0.43	0.43
Doppler Temperature Coefficient (pcm/degF)	-2.90 to -0.91	-2.90 to -0.91
Doppler Only Power Coefficient (pcm/%Power, Q = power in %)		
Least Negative, HFP to Hot Zero-Power (HZP)	$-9.50 + 0.035*Q$	$-12.0 + 0.045*Q$
Most Negative, HFP to HZP	$-24.0 + 0.100*Q$	$-24.0 + 0.100*Q$
Beta-Effective	0.0043 to 0.0072	0.0043 to 0.0072
Normal Operation $F_{\Delta H}^N$	1.77	1.77
Shutdown Margin ( $\% \Delta \rho$ )	1.90 – Units 1 & 2	1.90 – Units 1 & 2
Normal Operation $F_Q(Z)$	2.5	2.5

- Start of AFW pumps
- Feedwater isolation (including closure of valves and tripping of pumps)
- Start of containment fan coolers

The containment spray pumps are started due to the high-2 (Hi-Hi) containment pressure signal. The safety analysis limit for the setpoint is 38.7 psia.

#### 5.4.1.2.2 RCS Assumptions

The RCS determines the amount of energy that gets transferred to the secondary side which is an important element in determining the rate of the steam line break mass and energy release. The major features of the primary side analysis model are summarized below:

- The assumed NSSS power is 1,690 MWt.
- RCS average temperature is the full-power nominal value of 560.0°F plus an uncertainty of 4.0°F.
- Continued operation of the RCPs maintains a high heat transfer rate to the steam generators. (No LOOP)
- The model includes consideration of the heat that is stored in the RCS metal.
- Reverse heat transfer from the intact steam generator to the RCS coolant is modeled as the temperature in the RCS falls below the steam generator fluid temperature.
- Core residual heat generation is assumed based on the 1979 ANS decay heat plus  $2\sigma$  model (Reference 35).
- Conservative core reactivity coefficients corresponding to end-of-cycle conditions with the most reactive rod stuck out of the core are assumed. This maximizes the reactivity feedback effects as the RCS cools down as a result of the steam line break.
- All cases have credited a minimum shutdown margin of 1.9-percent  $\Delta k$ , assuming the most reactive rod does not insert.
- Minimum flow rates are modeled from ECCS injection, to conservatively minimize the amount of boron that provides negative reactivity feedback. The boron concentration upstream of the check valve in the SI line is credited at a conservatively low boron concentration based on the Technical Specification minimum RWST concentration (2,600 ppm).
- No SGTP is assumed to maximize the primary-to-secondary heat transfer rate.

#### 5.4.1.2.3 Secondary Side Assumptions

This subsection summarizes the major input assumptions associated with the steam generator, the main feedwater system, the auxiliary feedwater system, and the steam line.