

FEB 0 9 2009

L-PI-09-022 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

Response To Request For Additional 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)

- References: 1) 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 (ML081820137)
  - Letter from T. Wengert (NRC) to M. Wadley (NSPM), Prairie Island Nuclear Generating Plant, Units 1 and 2 Request For Additional Information Related to License Amendment Request For Technical Specifications Changes to Allow Use of Westinghouse 0.422-Inch OD 14x14 Vantage+ Fuel (TAC Nos. MD9142 and MD9143), dated January 12, 2009 (ML083580098)

By letter dated June 26, 2008 (Reference 1), 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), 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.

When separated from Enclosure 3, this letter may be made publicly available.

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On January 12, 2009, the NRC staff notified NSPM (Reference 2) that additional information was necessary for the staff to complete its review. NSPM's response includes information which is held proprietary by Westinghouse Electric Company, LLC (Westinghouse). Enclosure 1 provides a non-proprietary response, Enclosure 2 provides affidavits from Westinghouse, and Enclosure 3 provides the proprietary response to be withheld from public disclosure.

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.

In accordance with 10 CFR 50.91, NSPM is notifying the State of Minnesota of this License Amendment Request supplement by transmitting a non-proprietary 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: FEB 0 9 2009

Michael D. Walley

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

Enclosures (3)

cc: Administrator, Region III, USNRC Project Manager, Prairie Island, USNRC Resident Inspector, Prairie Island, USNRC State of Minnesota (w/o Enclosure 3)

## Non-Proprietary Responses to Requests for Additional Information License Amendment Request for Technical Specifications Changes to Allow Use of Westinghouse 422V+ Fuel

By letter dated June 26, 2008 (ML081820137), 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), 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. On January 12, 2009 (ML083580098), the NRC staff notified NSPM that additional information was necessary for the staff to complete its review. NRC requests for additional information (RAI) are repeated below with the NSPM response following:

Note: The "<sup>a,c</sup>" notation refers to the bases stated in the Westinghouse affidavits in Enclosure 2 for withholding the information from public disclosure.

2. The Revised Thermal Design Procedure (RTDP) combines uncertainties in a way that is somewhat different from the way proposed in this license amendment request, which reduces the assumed uncertainty and recovers it by assuming a bounding power level. Please show this treatment is acceptably conservative by providing comparative data. Compare the Design Limit departure from nucleate boiling ratio (DNBR) for PINGP using the traditional RTDP to that obtained using the bounding power level assumption with a reduced uncertainty. Also, compare the DNBR results for the limiting DNBR transient using the RTDP analytic process and using the bounding power level assumption with a reduced uncertainty.

## NSPM Response:

The Thermal-Hydraulic analysis for the 422V+ fuel transition was performed assuming that the fuel transition was preceded by an MUR (Measurement Uncertainty Recapture) uprate where the power uncertainty is reduced, allowing for a corresponding increase in the nominal core power. For Prairie Island, this MUR was expected to be 1.64%, for operation at 1677 MWt and 0.36% power uncertainty, as compared to current operation at 1650 MWt with 2.0% power uncertainty. For added conservatism, the RTDP analysis used a power uncertainty of [ ]<sup>a,c</sup>%.

The bounding Design Limit DNBR calculated at pre-MUR conditions (1650 MWt, 2.0% power uncertainty) is  $[]^{a,c}$ , or  $[]^{a,c}$  when rounded up to the nearest 0.01. The bounding Design Limit DNBR calculated at MUR conditions (1677 MWt, 0.5% power uncertainty) is  $[]^{a,c}$ , or  $[]^{a,c}$  when rounded up to the nearest 0.01. When considering the more precise, un-rounded limits, the Design Limit is, at a maximum,  $[]^{a,c}$ % lower at MUR conditions.

The minimum DNBR calculations were repeated at nominal operating conditions, at the limiting portion of the core limits, at Loss of Flow conditions, and at low power for a highly skewed axial power shape. The last case considered is not DNB limiting, but has the lowest sensitivity to changes in the power level, which therefore results in a minimal change in the calculated DNBR.

## Non-Proprietary Responses to Requests for Additional Information License Amendment Request for Technical Specifications Changes to Allow Use of Westinghouse 422V+ Fuel

The minimum reduction in DNBR associated with analysis at 1677 MWt as compared to operation at 1650 MWt is [  $]^{a,c}$ %, as shown below.

Operating Conditions	Reduction in minimum DNBR	
	Thm <sup>1</sup>	Typ <sup>2</sup>
Nominal	[] <sup>a,c</sup>	[] <sup>a,c</sup>
Loss of Flow		[] <sup>a,c</sup>
Core Limits		[] <sup>a,c</sup>
Low Power, High AO		[] <sup>a,c</sup>

<sup>1</sup> Thimble cell <sup>2</sup> Typical cell

It is thus concluded that the reduction in the Design Limit DNBR associated with the smaller power uncertainty is less than the reduction in the minimum DNBR associated with the higher power level. Therefore, DNB analyses at MUR conditions conservatively bound pre-MUR conditions with respect to the minimum calculated DNBR margin. There is a minimum of [ ]<sup>a,c</sup>% conservatism with respect to DNBR margin that results from analysis in this manner.

# 5b. The licensing report did not seem to indicate clearly that two separate transients had been analyzed. The NRC staff requests NSPM to distinguish between the two.

## NSPM Response:

There is  $[ ]^{a,c}$  analyzed for the Rod Withdrawal from a Subcritical Condition event; however, different assumptions are used in two separate cases to calculate the  $[ ]^{a,c}$ .

The analysis of the Rod Withdrawal from a Subcritical Condition event is performed in three stages. First, a spatial neutron kinetics computer code, TWINKLE, is used to calculate the  $[ ]^{a,c}$ . A single calculation is performed by the TWINKLE code on  $[ ]^{a,c}$ .

Next, the FACTRAN computer code uses the  $[ ]^{a,c}$  calculated by TWINKLE and performs  $[ ]^{a,c}$ . The first  $[ ]^{a,c}$  while the second is used to determine the  $[ ]^{a,c}$ . The  $[ ]^{a,c}$  calculated by FACTRAN is used in the VIPRE computer code for transient DNBR calculations. For the  $[ ]^{a,c}$  calculation, FACTRAN multiplies the  $[ ]^{a,c}$ . Since the transient is turned around via  $[ ]^{a,c}$  calculating the  $[ ]^{a,c}$  generates a more limiting transient than calculating a  $[ ]^{a,c}$ .

## Non-Proprietary Responses to Requests for Additional Information License Amendment Request for Technical Specifications Changes to Allow Use of Westinghouse 422V+ Fuel

6. The NRC staff requests NSPM to provide additional information concerning the core flow rates, the injection source assumed to be providing the diluting flow, and the total reactor coolant system (RCS) volume to justify the use of total RCS volume as a figure of merit, as opposed to the core coolant volume, as requested by the staff. Noting that the RCS configuration may change depending on the Operating Mode, the staff requests NSPM to consider all modes for the potential for an impact on the boron dilution analysis when preparing its response.

# NSPM Response:

## Modes 1 and 2

The dilution injection flows are modeled to account for conservatively high dilution rates from the chemical and volume control system charging pumps for the possible charging pump configurations allowed in each mode. In Modes 1 and 2, a conservatively high flow is assumed based on 3 charging pumps, which bounds the allowable operating configurations.

As additional support, the NRC staff verbally agreed that an adequate response to this question would be to provide a comparison of the calculated times available from alarm to a loss of shutdown margin (SDM) for each of the modes based on the volume modifications that result from a change to 422V+ fuel. Table 1 provides a comparison of the times calculated in the current analysis of record to those associated with 422V+ fuel for the cases in which the reactor is critical (Modes 1 and 2).

Table 1			
Mode	Time Available from Alarm to Loss of SDM		
	Prairie Island	Prairie Island	Acceptance
	Units 1 and 2	Units 1 and 2	Criterion
	Current Analysis of Record	with 422V+	(minutes)
	(minutes)	Fuel	
		(minutes)	
1 (manual)	20.6	20.4	>15
1 (automatic)	21.7	21.5	>15
2	17.9	17.8	>15

# Modes 3 through 6

NSPM understands that the boron dilution analysis and the resultant value of operator response time could be affected by the small decrease in core water volume (mass). At certain temperatures, the decrease in water volume between a 400V+ core and a 422V+ core may reach 0.5% of the RCS water volume with 400V+ core. Westinghouse analysis includes rounding conservatisms that will readily bound any small changes in water volume, including variations of 0.5% which are anticipated for the heavy bundle loadings. To demonstrate the insensitivity of this small variation on the Mode 3-6 boron dilution analyses, Westinghouse completed an evaluation of full 422V+ core with a

## Non-Proprietary Responses to Requests for Additional Information License Amendment Request for Technical Specifications Changes to Allow Use of Westinghouse 422V+ Fuel

conservative 0.6% decrease in core mass (Full Loop Configuration). The results showed that the shutdown margins are acceptable considering the TS boration levels, existing boration capabilities, and the 24-minute operator response time. The actual impact on the operator response time was less than 0.5 minutes which is less than 1.8% change from the representative analyses results. It should be noted that this is a representative analysis for the fuel transition to 422V+ and a cycle specific analysis will be completed for each core reload. The RCS volumes adjusted for the 422V+ fuel will be used in the cycle specific analysis.

# ENCLOSURE 2 AFFIDAVITS

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Westinghouse Electric Company Nuclear Services P.O. Box 355 Pittsburgh, Pennsylvania 15230-0355 USA

U.S. Nuclear Regulatory Commission Document Control Desk Washington, DC 20555-0001 Direct tel: (412) 374-4643 Direct fax: (412) 374-3846 e-mail: greshaja@westinghouse.com

Proj letter ref NSP-09-10

Our ref: CAW-09-2520

January 26, 2009

#### APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: "Prairie Island 422V+ Fuel Transition Program RAI Responses," (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-09-2520 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by Xcel Energy.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-09-2520 and should be addressed to J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Very truly yours,

J. A. Gresham, Manager Regulatory Compliance and Plant Licensing

cc: G. Bacuta (NRC OWFN 12E-1)

Enclosures

#### **AFFIDAVIT**

#### COMMONWEALTH OF PENNSYLVANIA:

SS

#### COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared J. A. Gresham, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

J. A. Gresham, Manager Regulatory Compliance and Plant Licensing

Sworn to and subscribed before me this 26<sup>st</sup> day of January, 2009

Aharon L. Markle

Notary Public

COMMONWEALTH OF PENNSYLVANIA Notarial Seal Sharon L. Markle, Notary Public Monroeville Boro, Altegheny County My Commission Expires Jan. 29, 2011 Member. Pennsylvania Association of Notaries

- (1) I am Manager, Regulatory Compliance and Plant Licensing, in Nuclear Services, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.
- (2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse "Application for Withholding" accompanying this Affidavit.
- (3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.
- (4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
  - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.
  - (ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's

competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

- (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.
- (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.
- (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.
- (c) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.
- (f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Westinghouse system which include the following:

- (a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.
- (b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.
- (c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

- (d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.
- (e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.
- (f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.
- (iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.
- (iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.
- (v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in "Prairie Island 422V+ Fuel Transition Program RAI Responses," (Proprietary) dated January 20, 2009, for submittal to the Commission, being transmitted by Xcel Energy letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse is that associated with Xcel Energy's responses to the NRC's Request for Additional Information (re: Prairie Island Units 1 and 2 transition to the Westinghouse 0.422-Inch OD 14x14 VANTAGE+ Fuel).

This information is part of that which will enable Westinghouse to:

(a) Obtain NRC approval of Westinghouse 0.422-Inch OD 14x14 VANTAGE+ Fuel for Prairie Island Units 1 and 2. (b) Respond to NRC Request for Additional Information in support of the transition to Westinghouse 0.422-Inch OD 14x14 VANTAGE+ Fuel for Prairie Island Units 1 and 2.

Further this information has substantial commercial value as follows:

- (a) Westinghouse plans to sell the use of this information to its customers for purposes of enhancing fuel performance.
- (b) The information requested to be withheld reveals the distinguishing aspects of a fuel design which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar calculations and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

#### **Proprietary Information Notice**

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

#### **Copyright Notice**

The reports transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies of the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.390 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond those necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.



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Direct tel: (412) 374-4643 Direct fax: (412) 374-3846 e-mail: greshaja@westinghouse.com

Proj letter ref NSP-09-14

Our ref: CAW-09-2524

January 28, 2009

#### APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: "Prairie Island 422V+ Fuel Transition Program RAI Responses" (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-09-2524 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by Xcel Energy.

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cc: G. Bacuta (NRC OWFN 12E-1)

Enclosures

#### **AFFIDAVIT**

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J. A. Gresham, Manager Regulatory Compliance and Plant Licensing

Sworn to and subscribed before me this 28<sup>th</sup> day of January, 2009

haron L. Markle

Notary Public

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- (v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in "Prairie Island 422V+ Fuel Transition Program RAI Responses," (Proprietary) dated January 28, 2009, for submittal to the Commission, being transmitted by Xcel Energy letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse is that associated with Xcel Energy's responses to the NRC's Request for Additional Information (re: Prairie Island Units 1 and 2 transition to the Westinghouse 0.422-Inch OD 14x14 VANTAGE+ Fuel).

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