

**ENCLOSURE 1 CONTAINS PROPRIETARY INFORMATION –  
WITHHOLD FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10 CFR 2.390**



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

May 18, 2016

L-MT-16-028  
10 CFR 50.4

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

Monticello Extended Power Uprate: Replacement Steam Dryer – Response to NRC  
Requests for Additional Information (CAC No. MF6730)

- References:
- 1) Letter from T. Beltz (NRC) to K. Fili (NSPM), "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. ML13343A006)
  - 2) Letter from M. Schimmel (NSPM) to Document Control Desk (NRC), "Monticello Extended Power Uprate: Replacement Steam Dryer – Responses to Clarification Questions and Revised Analysis Documentation (TAC MD9990)," L-MT-13-091, dated August 29, 2013. (ADAMS Accession No. ML13248A343)
  - 3) Email from T. Beltz (NRC) to J. Fields (NSPM), "Monticello Nuclear Generating Plant – EPU Power Ascension – Clarification Questions Regarding Data Review for 2004 MWt (112.9% of 1775 MWt) (TAC No. MF5153)," dated July 14, 2015.
  - 4) Letter from P. Gardner (NSPM) to Document Control Desk (NRC), "Monticello Extended Power Uprate: Submittal of Power Ascension Testing Results for Replacement Steam Dryer (TAC No. MF6730)," L-MT-15-074, dated October 12, 2015. (ADAMS Accession No. ML15289A073)

- 5) Email from R. Kuntz (NRC) to J. Fields (NSPM), "Monticello Nuclear Generating Plant – Requests for Additional Information re: Power Ascension Testing Results for the RSD (CAC No. MF6730)," dated February 11, 2016. (ADAMS Accession No. ML16048A508)

Pursuant to 10 CFR 50.92, the NRC issued Reference 1, License Amendment No. 176 to the Monticello Nuclear Generating Plant (MNGP) Renewed Operating License (OL) and Technical Specifications (TS) to increase the maximum authorized power level from 1775 megawatts thermal (MWt) to 2004 MWt. This change of power level is considered an extended power uprate (EPU). As part of the approval, MNGP was required to complete a power ascension test program (PATP) outlined in a series of license conditions to monitor and evaluate plant conditions while transitioning from 1775 MWt up to 2004 MWt.

In Reference 2, Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, provided the final analysis documentation for the replacement steam dryer (RSD) under EPU conditions. This documentation was used in support of the NRC's decision to grant license amendment 176 (Reference 1).

On July 14, 2015, after review of MNGP PATP data at full EPU conditions, the NRC determined that NSPM had successfully completed the PATP for MNGP, and indicated that operation at 2004 MWt was authorized in accordance with the license conditions (Reference 3).

In Reference 4, NSPM provided power ascension testing analysis results to the NRC in accordance with MNGP license conditions 2.C.15(b)2 and 2.C.15(e) as required by Reference 1. The results of the power ascension testing were derived from data taken from MNGP main steam line strain gauges at full EPU power and flow conditions. The analysis results demonstrated that the high-cycle fatigue calculations for the MNGP replacement steam dryer meet the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code Section III, Subsection NG criteria. The analysis results provided in Reference 4 resulted in revisions to a subset of the reports provided in Reference 2.

In Reference 5, the NRC provided NSPM requests for additional information (RAIs). The purpose of this letter is to provide the NRC with the RAI responses.

Enclosure 1 contains Westinghouse Electric Company, LLC (WEC) letter attachment, LTR-BWR-ENG-16-020-P, "*Responses to the U.S. NRC Requests for Additional Information Relative to the Monticello Perforated Plate Analysis*," dated May 5, 2016. Enclosure 1 provides responses to the RAIs from Reference 5. Enclosure 1 contains proprietary information.

Enclosure 2 contains a WEC affidavit executed to support withholding Enclosure 1 from public disclosure. The affidavit sets forth the basis on which the information may be


withheld from public disclosure by the NRC and addresses with specificity the considerations listed in 10 CFR 2.390(b)(4). NSPM requests that the proprietary information in Enclosure 1 be withheld from public disclosure in accordance with 10 CFR 2.390(a)4, as authorized by 10 CFR 9.17(a)4. Accordingly, it is respectfully requested that the information which is proprietary to WEC be withheld from public disclosure in accordance with 10 CFR 2.390.

Correspondence with respect to the copyright or proprietary aspects of WEC information or the supporting WEC affidavit in Enclosure 2 should be addressed to J. A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company LLC, 1000 Westinghouse Drive, Building 3 Suite 310, Cranberry Township, Pennsylvania 16066.

Enclosure 3 contains a nonproprietary version of Enclosure 1. The nonproprietary report is being provided based on the NRC's expectation that the submitter of the proprietary information should provide, if possible, a nonproprietary version of the document with brackets showing where the proprietary information has been deleted.

Summary of Commitments

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



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

Enclosures (3)

cc: Administrator, Region III, USNRC (w/o enclosures)  
Project Manager, Monticello Nuclear Generating Plant, USNRC  
Resident Inspector, Monticello Nuclear Generating Plant, USNRC (w/o enclosures)

**ENCLOSURE 2**

**AFFIDAVIT FOR WITHHOLDING PROPRIETARY DOCUMENTS**

**6 pages follow**

May 9, 2016

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF BUTLER:

I, James A. Gresham, am 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 my knowledge, information, and belief.

A handwritten signature in black ink, appearing to read "JA Gresham", is written over a horizontal line.

James A. Gresham, Manager

Regulatory Compliance

- (1) I am Manager, Regulatory Compliance, 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 Proprietary Information from Public Disclosure 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 constitute Westinghouse policy and provide 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.
  - (e) 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.
- (iii) 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.
- (iv) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, is to be received in confidence by the Commission.
- (v) 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.
- (vi) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in LTR-BWR-ENG-16-020 P-Attachment, "Responses to the U.S. NRC Requests for Additional Information Relative to the Monticello Perforated Plate Analysis" (Proprietary), 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 the NRC's further review of replacement steam dryer (RSD) methodology for Monticello Nuclear Generating Plant (MNGP), and may be used only for that purpose.
- (a) This information is part of that which will enable Westinghouse to assist Xcel Energy in responding to NRC Requests for Additional Information relative to the MNGP RSD 90-day report.



- (b) Further, this information has substantial commercial value as follows:
- (i) Westinghouse plans to sell the use of similar information to its customers for purposes of plant specific replacement steam dryer analysis for licensing basis applications..
  - (ii) Westinghouse can sell support and defense of industry guidelines and acceptance criteria for plant-specific applications.
  - (iii) The information requested to be withheld reveals the distinguishing aspects of a methodology 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 technical evaluation justifications 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 non-proprietary versions of a document, furnished to the NRC associated with the NRC's further review of replacement steam dryer (RSD) methodology for Monticello Nuclear Generating Plant (MNGP), and may be used only for that purpose.

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.

**ENCLOSURE 3**

**WESTINGHOUSE LETTER, LTR-BWR-ENG-16-020 NP-ATTACHMENT  
(NON-PROPRIETARY)**

**RESPONSES TO THE U.S. NRC REQUESTS FOR ADDITIONAL INFORMATION  
RELATIVE TO THE MONTICELLO PERFORATED PLATE ANALYSIS**

**8 pages follow**

**LTR-BWR-ENG-16-020 NP-Attachment**

**Responses to the U.S. NRC Requests for Additional  
Information Relative to the Monticello Perforated Plate  
Analysis**

**May 5, 2016**

---

Westinghouse Electric Company LLC  
1000 Westinghouse Drive  
Cranberry Township, PA 16066 USA

© 2016 Westinghouse Electric Company LLC  
All Rights Reserved

**MNGP EPU-EMCB-RSD-90 Day Report-RAI-1:**

*To provide the USNRC Staff with a better understanding of the additional damping introduced at the perforated plates and to compare the damping with the 1-percent structural damping ratio, the licensee is requested to convert the perforated plate damping coefficients corresponding to EPU flow conditions to equivalent frequency dependent structural damping ratios for various frequencies including 10, 25, and 50 Hz.*

*One approach to computing the damping ratio is the following relationship: damping ratio =  $b / (2 * m * \omega)$ , where  $b$  is the integrated damping coefficient (units force/velocity) over a given plate;  $m$  is the mass of the perforated plate considering its porosity; and  $\omega$  is radial frequency ( $2 * \pi * \text{cyclic frequency}$ ).*

**Response:**

**Reference:**

1. Westinghouse Calculation Note, CN-A&SA-09-08, Rev. 4, "Monticello Steam Dryer Finite Element Model," August 22, 2013.

[

] <sup>a,b,c</sup>

Any damping can be expressed in terms of critical damping with a non-dimensional number  $\zeta$ , called the damping ratio:

$$\zeta = \frac{b}{2 * m_{eff} * \omega}$$

Where

$m_{eff}$  – effective modal mass

$b$  – integrated damping coefficient (units force/velocity) over a given plate

$\omega$  – natural radial frequency

The NRC equation identified in the RAI was used to formulate the information provided below.

[

] <sup>a,b,c</sup>

[

] a,b,c

[

] a,b,c

**Table RAI-1-1 Dynamic Characteristics of Monticello RSD Inner Perforated Plate**

1st Natural Frequency (Hz)	Direction	Effective Mass (lb-sec <sup>2</sup> /in)	Ratio Effective Mass to Total Mass

a,b,c

**Table RAI-1-2 Dynamic Characteristics of Monticello RSD Middle Perforated Plate**

1st Natural Frequency (Hz)	Direction	Effective Mass (lb-sec <sup>2</sup> /in)	Ratio Effective Mass to Total Mass	a,b,c

**Table RAI-1-3 Dynamic Characteristics of Monticello RSD Outer Perforated Plate**

1st Natural Frequency (Hz)	Direction	Effective Mass (lb-sec <sup>2</sup> /in)	Ratio Effective Mass to Total Mass	a,b,c

[

]a,b,c

a,b,c



**Figure RAI-1-1 Monticello Steam Dryer (Top View) Perforated Plate Schematic**

Table RAI-1-4 through Table RAI-1-7 below summarize the results of the hydrodynamic damping calculations.

**Table RAI-1-4  
Inlet 1 Sub-Region**

Inlet-1 14.5% Opening	Natural Frequency (Hz)	Radial Frequency $\omega$ rad/s	Effective Mass X-dir $m_{eff}$ Lbf- sec <sup>2</sup> /ft	Critical Damping $2 \times m_{eff} \times \omega$ Lbf-sec rad/ft	Plate Area ft <sup>2</sup>	Hydrodynamic Damping Coefficient lbf/(ft/sec)/ft <sup>2</sup>	b = Plate Area× Hydrodynamic Damping Coefficient  lbf/(ft/sec)	Damping Ratio = b ÷ Critical Damping
[Ref 1]					[Ref 1]	[Ref 1]		
Inner Bank								
Middle Bank								
Outer Bank								

a,b,c



**Table RAI-1-5  
Inlet 2 Sub-Region**

Inlet-2 22.7% Opening	Natural Frequency (Hz)	Radial Frequency $\omega$ rad/s	Effective Mass X-dir $m_{eff}$ Lbf- sec <sup>2</sup> /ft	Critical Damping $2 \times m_{eff} \times \omega$ Lbf-sec rad/ft	Plate Area ft <sup>2</sup>	Hydrodynamic Damping Coefficient lbf/(ft/sec)/ft <sup>2</sup>	b = Plate Area× Hydrodynamic Damping Coefficient lbf/(ft/sec)	Damping Ratio = b ÷ Critical Damping
[Ref 1]					[Ref 1]	[Ref 1]	lbf/(ft/sec)	
Inner Bank								
Middle Bank								
Outer Bank								

a,b,c

**Table RAI-1-6  
Inlet 3 Sub-Region**

Inlet-3 32.6% Opening	Natural Frequency (Hz)	Radial Frequency $\omega$ rad/s	Effective Mass X- dir $m_{eff}$ Lbf- sec <sup>2</sup> /ft	Critical Damping $2 \times m_{eff} \times \omega$ Lbf-sec rad/ft	Plate Area ft <sup>2</sup>	Hydrodynamic Damping Coefficient lbf/(ft/sec)/ft <sup>2</sup>	b = Plate Area× Hydrodynamic Damping Coefficient lbf/(ft/sec)	Damping Ratio = b ÷ Critical Damping
[Ref 1]					[Ref 1]	[Ref 1]	lbf/(ft/sec)	
Middle Bank								
Outer Bank								

a,b,c

**Table RAI-1-7  
Inlet 4 Sub-Region**

Inlet-4 22.7% Opening	Natural Frequency (Hz)	Radial Frequency $\omega$ rad/s	Effective Mass X- direction $m_{eff}$ Lbf- sec <sup>2</sup> /ft	Critical Damping $2 \times m_{eff} \times \omega$ Lbf-sec rad/ft	Plate Area ft <sup>2</sup>	Hydrodynamic Damping Coefficient lbf/(ft/sec)/ft <sup>2</sup>	b = Plate Area× Hydrodynamic Damping Coefficient lbf/(ft/sec)	Damping Ratio = b ÷ Critical Damping
[Ref 1]					[Ref 1]	[Ref 1]	lbf/(ft/sec)	
Middle Bank								
Outer Bank								

a,b,c

[

]a,b,c

**MNGP EPU-EMCB-RSD-90 Day Report-RAI-2:**

*Please provide current Minimum Alternating Stress Ratios (MASRs) for the perforated plates, along with cumulative stress plots for the two highest stressed perforated plate regions.*

**Response:**

[

]a,b,c

[

]a,b,c

a,b,c



**Figure RAI-2-1 Cumulative Stress PSD Plot for the Outer Bank Perforated Plate**

a,b,c



**Figure RAI-2-1 Cumulative Stress PSD Plot for the Middle Bank Perforated Plate**