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June 28, 2021

L-PI-21-027
10 CFR 50.46

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

Prairie Island Nuclear Generating Plant, Units 1 and 2
Docket Nos. 50-282 and 50-306
Renewed Facility Operating License Nos. DPR-42 and DPR-60

2020 10 CFR 50.46 LOCA Annual Report

References: 1) Westinghouse Letter LTR-LIS-21-22 "Prairie Island Units 1 and 2 10 CFR 50.46 Annual Notification and Reporting for 2020"

Pursuant to 10 CFR 50.46(a)(3)(ii), Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), hereby submits the 2020 annual report of changes and errors associated with the Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2 Emergency Core Cooling System (ECCS) analyses (Enclosure 1).

PINGP has reviewed the above Reference, which addresses 10 CFR 50.46 reporting information pertaining to the Emergency Core Cooling System (ECCS) Evaluation Model changes that were implemented by Westinghouse for 2020. The review concludes that the effect of changes to, or errors in, the Evaluation Models on the limiting transient peak cladding temperature (PCT) is not significant for 2020 and remains unchanged from the 2019 annual report.

Enclosure 1 page 3 provides an assessment of the specific changes and enhancements to the Westinghouse Evaluation Models for 2020. These model changes and enhancements do not have impacts on the PCT and, generally, will not be presented on the PCT rack-up forms.

Enclosure 1 pages 4 through 10 provides PCT rack-up forms for the calculated Large Break Loss-of-Coolant Accident (LOCA) and Small Break LOCA PCT margin allocations in effect for the 2020 PINGP Evaluation Models. The PCT values determined in the Large Break and Small Break LOCA analysis of record, combined with all of the PCT allocations, remain below the 10 CFR 50.46(b)(1) regulatory limit of 2200°F. Therefore, PINGP is in compliance with 10 CFR 50.46 requirements and no reanalysis or other action is required.

If you have any questions about this submittal, please contact Carrie Seipp, Senior Regulatory Engineer, at 612-330-5576.

Summary of Commitments

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



Christopher P. Domingos
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company – Minnesota

Enclosure (1)

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

ENCLOSURE 1

Westinghouse Letter LTR-LIS-21-22 "Prairie Island Units 1 and 2 10 CFR 50.46 Annual Notification and Reporting for 2020"



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Our ref: LTR-LIS-21-22

**Prairie Island Units 1 and 2
10 CFR 50.46 Annual Notification and Reporting for 2020**

Dear Sir or Madam:

This is a notification of 10 CFR 50.46 reporting information pertaining to the Westinghouse Electric Company Evaluation Models/analyses. As committed to in WCAP-13451, Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting, Westinghouse is providing an Annual Report for Emergency Core Cooling System (ECCS) Evaluation Model changes and errors for the 2020 model year. All necessary standardized reporting pages for any changes and errors for the Evaluation Models utilized for your plant(s) are enclosed, consistent with the commitment following the NUPIC audit in early 1999. Peak Clad Temperature (PCT) summary sheets are enclosed. All necessary revisions for any non-zero, non-discretionary PCT changes have been included. Changes with estimated PCT impacts of 0°F may not be presented on the PCT summary sheet. The Evaluation Model changes and errors (except any plant-specific errors in the application of the model) have been provided to the NRC via Westinghouse letter.

This information is for your use in making a determination relative to the reporting requirements of 10 CFR 50.46. The information that is provided in this letter was prepared in accordance with Westinghouse's Quality Management System (QMS). Please contact your LOCA plant cognizant engineer (PCE), Julie L. Hartz (412-374-2321), if there are any questions concerning this information.

Author: (Electronically Approved)*
Heather McMillen

Verified: (Electronically Approved)*
Julie L. Hartz

Approved: (Electronically Approved)*
Amy J. Colussy

Attachment: 10 CFR 50.46 Reporting Text and PCT Summary Sheets (9 Pages)

**Electronically approved records are authenticated in the electronic document management system.*

ERRORS IN UNHEATED CONDUCTOR NODING

Background

A discrepancy was identified whereby some unheated conductors used node sizes that are inconsistent with the analysis input guidelines in the WCOBRA/TRAC vessel model for some two-loop plants. An evaluation was completed to estimate the effect of this modeling error on the affected two-loop large break LOCA (LBLOCA) analyses with the Automated Statistical Treatment of Uncertainty Method (ASTRUM). The correction of this error represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model

2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect

The evaluation of this error determined that it has a negligible effect on the LBLOCA analysis results, leading to an estimated peak cladding temperature (PCT) impact of 0°F.

LOCA Peak Cladding Temperature (PCT) Summary

Plant Name: PRAIRIE ISLAND 1
Utility Name: Xcel Energy, Inc
EM: NOTRUMP
AOR Description: Appendix K Small Break
Summary Sheet Status: Current

	PCT (°F)	Reference #	Note #
ANALYSIS-OF-RECORD	959	1	

AOR + ASSESSMENTS PCT = 959.0 °F

REFERENCES

- 1 LTR-LIS-08-158, "Transmittal of Future Prairie Island Units 1 and 2 PCT Summaries," February 2008.

NOTES:

- (a) None

Version: PRAIRIE ISLAND 1 NSP_LOCA-50.46_NSP_Base_Appendix_K_SBLOCA – 1.2 V.V

LOCA Peak Cladding Temperature (PCT) Summary

Plant Name: PRAIRIE ISLAND 1
Utility Name: Xcel Energy, Inc
EM: ASTRUM (2004)
AOR Description: Best Estimate Large Break
Summary Sheet Status: IFBA/Gad

	PCT (°F)	Reference #	Note #	
ANALYSIS-OF-RECORD	1765	1		
ASSESSMENTS*	Delta PCT (°ΔF)	Reference #	Note #	Reporting Year**
1. Revised Heat Transfer Multiplier Distributions	-2	3		2013
2. Error in Burst Strain Application	25	4		2013
3. Evaluation of the Introduction of IFBA Fuel	0	2		2018
4. Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown	227	5	(a)	2012
AOR + ASSESSMENTS		PCT = 2015.0 °F		

* The licensee should determine the reportability of these assessments pursuant to 10 CFR 50.46.

** The "Reporting Year" refers to the annual reporting year in which this assessment was included.

REFERENCES

- 1 WCAP-17783-P, "Best-Estimate Analysis of the Large-Break Loss-of-Coolant Accident for Prairie Island Units 1 and 2 with Replacement Steam Generators Using ASTRUM Methodology," June 2013.
- 2 LTR-LIS-15-287, Rev. 1, "Prairie Island Units 1 and 2, 10 CFR 50.46 Notification and Reporting for the Revised Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown Evaluation and the Introduction of IFBA Fuel," September 2015.
- 3 LTR-LIS-13-366, Revision 1, "Prairie Island Units 1 and 2 10 CFR 50.46 Report for Revised Heat Transfer Multiplier Distributions," August 2013.
- 4 LTR-LIS-14-50, "Prairie Island Units 1 and 2 10 CFR 50.46 Report for the HOTSPOT Burst Strain Error Correction," January 2014.

Version: PRAIRIE ISLAND 1 NSP_LOCA-50.46_NSIFBA_GAD_ASTRUM – 1.3 V.V

- 5 LTR-LIS-12-414, "Prairie Island Units 1 and 2, 10 CFR 50.46 Notification and Reporting for Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown," September 2012.

NOTES:

- (a) This evaluation credits peaking factor burndown, see Reference 5.

Version: PRAIRIE ISLAND 1 NSP_LOCA-50.46_NSP_IFBA_GAD_ASTRUM – 1.3 V.V

LOCA Peak Cladding Temperature (PCT) Summary

Plant Name: PRAIRIE ISLAND 2
Utility Name: Xcel Energy, Inc
EM: NOTRUMP
AOR Description: Appendix K Small Break
Summary Sheet Status: Current

	PCT (°F)	Reference #	Note #
ANALYSIS-OF-RECORD	959	1,2	a

AOR + ASSESSMENTS PCT = 959.0 °F

REFERENCES

- 1 LTR-LIS-08-158, "Transmittal of Future Prairie Island Units 1 and 2 PCT Summaries," February 2008.
- 2 LTR-LIS-13-274, "Prairie Island Units 1 and 2, 10 CFR 50.46 Summary Sheets for the Evaluation to Support the Unit 2 Installation of AREVA Model 56/19 Replacement Steam Generators (RSGs)," June 2013.

NOTES:

- (a) The Unit 1 AOR is applicable to Unit 2 with the RSGs installed.

Version: PRAIRIE ISLAND 2 NRP_LOCA-50.46_NRP_Base_Appendix_K_SBLOCA – 1.2 V.V

LOCA Peak Cladding Temperature (PCT) Summary

Plant Name: PRAIRIE ISLAND 2
Utility Name: Xcel Energy, Inc
EM: ASTRUM (2004)
AOR Description: Best Estimate Large Break
Summary Sheet Status: Current

	PCT (°F)	Reference #	Note #	
ANALYSIS-OF-RECORD	1765	1		
ASSESSMENTS*	Delta PCT (°ΔF)	Reference #	Note #	Reporting Year**
1. Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown	227	2	(a),(b)	2012
2. Revised Heat Transfer Multiplier Distributions	-2	3		2013
3. Error in Burst Strain Application	25	4		2013
AOR + ASSESSMENTS		PCT = 2015.0 °F		

* The licensee should determine the reportability of these assessments pursuant to 10 CFR 50.46.

** The "Reporting Year" refers to the annual reporting year in which this assessment was included.

REFERENCES

- 1 WCAP-17783-P, "Best-Estimate Analysis of the Large-Break Loss-of-Coolant Accident for Prairie Island Units 1 and 2 with Replacement Steam Generators Using ASTRUM Methodology," June 2013.
- 2 LTR-LIS-12-414, "Prairie Island Units 1 and 2, 10 CFR 50.46 Notification and Reporting for Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown," September 2012.
- 3 LTR-LIS-13-366, Revision 1, "Prairie Island Units 1 and 2 10 CFR 50.46 Report for Revised Heat Transfer Multiplier Distributions," August 2013.
- 4 LTR-LIS-14-50, "Prairie Island Units 1 and 2 10 CFR 50.46 Report for the HOTSPOT Burst Strain Error Correction," January 2014.

NOTES:

- (a) This evaluation credits peaking factor burndown, see Reference 2.
- (b) The reporting text and line item originally identified for Unit 1 in Reference 2 is applicable to Unit 2 with RSGs.

Version: PRAIRIE ISLAND 2 NRP_LOCA-50.46_NRP_Base_ASTRUM – 1.1 V.V

LOCA Peak Cladding Temperature (PCT) Summary

Plant Name: PRAIRIE ISLAND 2
Utility Name: Xcel Energy, Inc
EM: ASTRUM (2004)
AOR Description: Best Estimate Large Break
Summary Sheet Status: IFBA/Gad

	PCT (°F)	Reference #	Note #	
ANALYSIS-OF-RECORD	1765	1		
ASSESSMENTS*	Delta PCT (°ΔF)	Reference #	Note #	Reporting Year**
1. Revised Heat Transfer Multiplier Distributions	-2	3		2013
2. Error in Burst Strain Application	25	4		2013
3. Evaluation of the Introduction of IFBA Fuel	0	2		2019
4. Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown	227	5	(a)	2012
AOR + ASSESSMENTS		PCT = 2015.0 °F		

* The licensee should determine the reportability of these assessments pursuant to 10 CFR 50.46.

** The "Reporting Year" refers to the annual reporting year in which this assessment was included.

REFERENCES

- 1 WCAP-17783-P, "Best-Estimate Analysis of the Large-Break Loss-of-Coolant Accident for Prairie Island Units 1 and 2 with Replacement Steam Generators Using ASTRUM Methodology," June 2013.
- 2 LTR-LIS-15-287, Rev. 1, "Prairie Island Units 1 and 2, 10 CFR 50.46 Notification and Reporting for the Revised Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown Evaluation and the Introduction of IFBA Fuel," September 2015.
- 3 LTR-LIS-13-366, Revision 1, "Prairie Island Units 1 and 2 10 CFR 50.46 Report for Revised Heat Transfer Multiplier Distributions," August 2013.
- 4 LTR-LIS-14-50, "Prairie Island Units 1 and 2 10 CFR 50.46 Report for the HOTSPOT Burst Strain Error Correction," January 2014.
- 5 LTR-LIS-12-414, "Prairie Island Units 1 and 2, 10 CFR 50.46 Notification and Reporting for Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown," September 2012.

Version: PRAIRIE ISLAND 2 NRP_LOCA-50.46_NRP_IFBA_GAD_ASTRUM – 1.3 V.V

NOTES:

- (a) This evaluation credits peaking factor burndown, see Reference 5.

Version: PRAIRIE ISLAND 2 NRP_LOCA-50.46_NRP_IFBA_GAD_ASTRUM – 1.3 V.V

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10 CFR 50.46 Reporting SharePoint Site Check:

**EMs applicable to Prairie Island:
Realistic Large Break – ASTRUM (2004)
Appendix K Small Break – NOTRUMP**

2020 Issues

Transmittal Letter	Issue Description
None	None

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Approval Information

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