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10 CFR 50.46

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

Corrections to Emergency Core Cooling System (ECCS) Evaluation Models

Enclosed please find enclosure 1, "Westinghouse Loss of Coolant Accident (LOCA) Evaluation Model Changes," which is the 2009 annual report of corrections to the Prairie Island Nuclear Generating Plant (PINGP) Units 1 and 2 ECCS evaluation models. This report is submitted in accordance with the provisions of 10 CFR 50.46 and summarizes changes made to both the large break LOCA (LBLOCA) and small break LOCA (SBLOCA) analyses.

The SBLOCA and LBLOCA peak clad temperature (PCT) assessment sheets for Unit 1 and Unit 2 are included in enclosure 2. The limiting LOCA analysis PCT for PINGP Unit 1 and Unit 2, with consideration of all 10 CFR 50.46 assessments, remains the LBLOCA analysis as summarized in enclosure 2.

Neither enclosure 1 nor enclosure 2 need be withheld from public disclosure.

Summary of Commitments

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

For M. Schimmel

Mark A. Schimmel
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota

Enclosures (2)

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

ENCLOSURE 1

Westinghouse LOCA Evaluation Model Changes

4 pages follow

GENERAL CODE MAINTENANCE
(Discretionary Change)

Background
Various changes have been made to enhance the usability of codes and to streamline future analyses. Examples of these changes include modifying input variable definitions, units and defaults; improving the input diagnostic checks; enhancing the code output; optimizing active coding; and eliminating inactive coding. These changes represent Discretionary Changes that will be implemented on a forward-fit basis in accordance with Section 4.1.1 of WCAP-13451.

Affected Evaluation Model(s)
1996 Westinghouse Best Estimate Large Break LOCA Evaluation Model
1999 Westinghouse Best Estimate Large Break LOCA Evaluation Model, Application to PWRs with Upper Plenum Injection
2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect
The nature of these changes leads to an estimated PCT impact of 0°F.

ERROR IN ASTRUM PROCESSING OF AVERAGE ROD BURNUP AND ROD INTERNAL PRESSURE
(Non-Discretionary Change)

Background
An error was discovered in the processing of the burnup and rod internal pressure inputs for average core rods in ASTRUM analyses. The correction of this error has been evaluated for impact on current licensing-basis analyses and will be incorporated into the ASTRUM method at a future time. These changes represent a closely-related group of Non-Discretionary Changes in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)
2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect
This error was evaluated to have a negligible impact on PCT, leading to an estimated impact of 0°F for 10 CFR 50.46 reporting purposes.

DISCREPANCY IN METAL MASSES USED FROM DRAWINGS
(Non-Discretionary Change)

Background
Discrepancies were discovered in the use of lower support plate (LSP) metal masses from drawings. The updated LSP metal masses have been evaluated for impact on current licensing-basis analysis results and will be incorporated on a forward-fit basis. This change represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)
SECY UPI WCOBRA/TRAC Large Break LOCA Evaluation Model
1996 Westinghouse Best Estimate Large Break LOCA Evaluation Model
1999 Westinghouse Best Estimate Large Break LOCA Evaluation Model, Application to PWRs with Upper Plenum Injection
2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect
The lower support plate mass error is relatively minor and would be expected to have a negligible effect on the Large Break LOCA analysis results, leading to an estimated PCT impact of 0°F for 10 CFR 50.46 reporting purposes.

HOTSPOT GAP HEAT TRANSFER LOGIC
(Non-Discretionary Change)

Background
The HOTSPOT code has been updated to incorporate the following changes to the gap heat transfer logic: (1) change the gap temperature from the pellet average temperature to the average of the pellet outer surface and cladding inner surface temperatures; (2) correct the calculation of the pellet surface emissivity to use a temperature in °R (as specified in Equation 7-28 of Reference 1) instead of °F; and (3) revise the calculation of the gap radiation heat transfer coefficient to delete a term and temperature adder not shown in or suggested by Equation 7-28 of Reference 1. These changes represent a closely-related group of Non-Discretionary Changes in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)
1996 Westinghouse Best Estimate Large Break LOCA Evaluation Model
1999 Westinghouse Best Estimate Large Break LOCA Evaluation Model, Application to PWRs with Upper Plenum Injection
2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect
Sample calculations showed a minimal impact on PCT, leading to an estimated effect of 0°F.

Reference(s)
1. WCAP-12945-P-A, Volume 1, Revision 2, "Code Qualification Document for Best Estimate LOCA Analysis, Volume I: Models and Correlations," March 1998.

ENCLOSURE 2

LBLOCA and SBLOCA Peak Clad Temperature Assessment Sheets

4 pages follow

Westinghouse LOCA Peak Clad Temperature Summary for ASTRUM Best Estimate Large Break

Plant Name: Prairie Island Unit 1
Utility Name: Xcel Energy, Inc
Revision Date: 1 /27/10

Analysis Information

EM:	ASTRUM (2004)	**Analysis Date:**	11/30/07	**Limiting Break Size:**	Split
FQ:	2.5	**FdH:**	1.77		
Fuel:	422 Vantage +	**SGTP (%):**	10		

Notes:

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1765	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . None	0		
C. 2009 ECCS MODEL ASSESSMENTS			
1 . None	0		
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 1765		

* It is recommended that the licensee determine if these PCT allocations should be considered with respect to 10 CFR 50.46 reporting requirements.

References:

1 WCAP-16890-P, Revision 1, "Best-Estimate Analysis of the Large-Break Loss-of-Coolant Accident for the Prairie Island Nuclear Plant Unit 1 Using ASTRUM Methodology," June 2008.

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Name: Prairie Island Unit 1
Utility Name: Xcel Energy, Inc
Revision Date: 1 /27/10

Analysis Information

EM:	NOTRUMP	**Analysis Date:**	1/21/08	**Limiting Break Size:**	3 inch
FQ:	2.5	**FdH:**	1.77		
Fuel:	422 Vantage +	**SGTP (%):**	10		
Notes:	Zirlo™ (14X14), Framatome RSG				

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	959	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . None	0		
C. 2009 ECCS MODEL ASSESSMENTS			
1 . None	0		
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 959		

* It is recommended that the licensee determine if these PCT allocations should be considered with respect to 10 CFR 50.46 reporting requirements.

References:

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

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for ASTRUM Best Estimate Large Break

Plant Name: Prairie Island Unit 2
Utility Name: Xcel Energy, Inc
Revision Date: 1 /27/10

Analysis Information

EM:	ASTRUM (2004)	**Analysis Date:**	6/1/06	**Limiting Break Size:**	Split
FQ:	2.5	**FdH:**	1.77		
Fuel:	OFA	**SGTP (%):**	25		

Notes:

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1546	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . None	0		
C. 2009 ECCS MODEL ASSESSMENTS			
1 . None	0		
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 1546		

* It is recommended that the licensee determine if these PCT allocations should be considered with respect to 10 CFR 50.46 reporting requirements.

References:

1 . WCAP-16508-P, "Best-Estimate Analysis of the Large-Break Loss-of-Coolant Accident for the Prairie Island Nuclear Plant Unit 2 Using ASTRUM Methodology," 6/2006

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Name: Prairie Island Unit 2
Utility Name: Xcel Energy, Inc
Revision Date: 1 /27/10

Analysis Information

EM:	NOTRUMP	**Analysis Date:**	9/1/00	**Limiting Break Size:**	3 inch
FQ:	2.8	**FdH:**	2		
Fuel:	OFA	**SGTP (%):**	25		
Notes:	Zirlo™ (14X14)				

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1142	1	(a)
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . No Items for 2000, 2001 & 2002 Reports	0	2,4,5	
2 . NOTRUMP Bubble Rise / Drift Flux Model Inconsistency Corrections	35	6,7	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . None	0		
C. 2009 ECCS MODEL ASSESSMENTS			
1 . None	0		
D. OTHER*			
1 . Evaluation for Reduced Auxilary Feedwater Flow Rate	0	3	
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 1177		

* It is recommended that the licensee determine if these PCT allocations should be considered with respect to 10 CFR 50.46 reporting requirements.

References:

1 . NSP-00-045, "SBLOCA Re-analysis with Revised NOTRUMP Code," October 2, 2000.

2 . NSP-01-006, "Northern States Power Company Prairie Island Units 1 and 2 10 CFR 50.46 Annual Notification and Reporting for 2000," March 6, 2001.

3 . NSP-02-36, "SBLOCA Limited FSAR Update and Evaluation for Revised Auxiliary Feedwater Flow Rate," October 2002.

4 . NSP-02-5, "Nuclear Management Company Prairie Island Units 1 and 2 10 CFR 50.46 Annual Notification and Reporting for 2001," March 2002.

5 . NSP-03-19, "Nuclear Management Company Prairie Island Units 1 and 2 10 CFR 50.46 Annual Notification and Reporting for 2002," March 2003.

6 . NSP-03-68, "10 CFR 50.46 Mid-Year Notification and Reporting for 2003," November 2003.

7 . NSP-03-38, "Nuclear Management Company Prairie Island Units 1 and 2 10 CFR 50.46 Annual Notification and Reporting for 2003," March 2004.

Notes:

(a) Accumulator water volume sensitivity of +/- 30 cubic feet included.