

# Attachment 1

## 1996 Annual 10 CFR 50.46 Report Of Changes Affecting PCT

## SBLOCTA FUEL ROD INITIALIZATION

### Background

An error was discovered in the SBLOCTA code related to adjustments which are made as part of the fuel rod initialization process which is used to obtain agreement between the SBLOCTA model and the fuel data supplied from the fuel thermal-hydraulic design calculations at full power, steady-state conditions. Specifically, an adjustment to the power, which is made to compensate for adjustments to the assumed pellet diameter was incorrect. Additionally, updates were made to the fuel rod clad creep and strain model to correct logic errors that could occur in certain transient conditions. These model revisions also had a small affect on the fuel rod initialization process, and can produce small affects during the transient. Due to the small magnitude of affects, and the interaction between the two items, they are being evaluated as a single, closely related affect.

This change is considered to be a Non-Discretionary Change as described in WCAP-13451.

### Affected Evaluation Models

1985 Westinghouse Small Break LOCA Evaluation Model with NOTRUMP

### Estimated Effects

Representative plant calculations with the corrected model demonstrated that these revisions result in a predicted peak clad temperature increase on the order of +10 °F. This 10 °F penalty has been assessed against all existing analyses of record with the above model.

## Attachment 2

1996 Annual 10 CFR 50.46 Report  
Peak Clad Temperature  
Margin Utilization Sheets

# Small Break Peak Clad Temperature Margin Utilization

Revision Date: 04/14/97

Plant Name: Prairie Island Units 1 and 2  
Utility Name: Northern States Power

Eval. Model: NOTRUMP  
Fuel: 14x14 OFA ZIRLO(TM)  
FQ=2.80      FdH=2.00      SGTP=25%

	Reference*	Clad Temperature	Notes
A. ANALYSIS OF RECORD (7/93)	1	PCT= 1195 °F	1
B. PRIOR PERMANENT ECCS MODEL ASSESSMENTS	2	ΔPCT= -29 °F	
C. 10 CFR 50.59 SAFETY EVALUATIONS	Table A	ΔPCT= 0 °F	
D. 1996 10 CFR 50.46 MODEL ASSESSMENTS (Permanent Assessment of PCT Margin)			
1. SBLOCTA Fuel Rod Initialization Error		ΔPCT= 10 °F	
E. TEMPORARY ECCS MODEL ISSUES**			
1. None		ΔPCT= 0 °F	
F. OTHER MARGIN ALLOCATIONS			
1. None		ΔPCT= 0 °F	
<b>LICENSING BASIS PCT + MARGIN ALLOCATIONS</b>		<b>PCT= 1176 °F</b>	

\* References for the Peak Clad Temperature Margin Utilization summary can be found in Table 3.

\*\* It is recommended that these temporary PCT allocations which address current LOCA model issues not be considered with respect to 10 CFR 50.46 reporting requirements.

Notes:

1. Includes annular pellet evaluation.



# Large Break Peak Clad Temperature Margin Utilization

Revision Date: 04/14/97

Plant Name: Prairie Island Units 1 and 2  
Utility Name: Northern States Power

Eval. Model: SECY UPI  
Fuel: 14x14 OFA ZIRLO(TM)  
FQ=2.40 FdH=1.77 SGTP=15%

	Reference*	Clad Temperature	Notes
A. ANALYSIS OF RECORD (3/95)	3,4	PCT= 2180 °F	1
B. PRIOR PERMANENT ECCS MODEL ASSESSMENTS	2	ΔPCT= -175 °F	
C. 10 CFR 50.59 SAFETY EVALUATIONS	Table A	ΔPCT= 0 °F	
D. 1996 10 CFR 50.46 MODEL ASSESSMENTS (Permanent Assessment of PCT Margin)			
1. None		ΔPCT= 0 °F	
E. TEMPORARY ECCS MODEL ISSUES**			
1. None		ΔPCT= 0 °F	
F. OTHER MARGIN ALLOCATIONS			
1. None		ΔPCT= 0 °F	

## LICENSING BASIS PCT + MARGIN ALLOCATIONS

PCT= 2005 °F

\* References for the Peak Clad Temperature Margin Utilization summaries can be found in Table B.

\*\* It is recommended that these temporary PCT allocations which address current LOCA model issues not be considered with respect to 10 CFR 50.46 reporting requirements.

### Notes:

1. P-bar-HA increased from 1.57 to 1.59

Table A - 10 CFR 50.59 Safety Evaluations

Revision Date: 04/14/97

Plant Name: Prairie Island Units 1 and 2  
Utility Name: Northern States Power

	Reference	Clad Temperature $\Delta$ PCT=	Notes
I. SMALL BREAK ECCS SAFETY EVALUATIONS		0 °F	
A. None			
<b>TOTAL 10 CFR 50.59 SMALL BREAK ASSESSMENTS</b>		<b>PCT= 0 °F</b>	
II. LARGE BREAK ECCS SAFETY EVALUATIONS		$\Delta$ PCT= 0 °F	
A. None			
<b>TOTAL 10 CFR 50.59 LARGE BREAK ASSESSMENTS</b>		<b>PCT= 0 °F</b>	
Notes:			
None			

Table B - References

1. NSP-93-521, "Northern Power Company Prairie Island Units 1 and 2 Small Break Loss-of-Coolant Accident Final Engineering Report for the ZIRLO(TM) Fuel Upgrade," July 30, 1993.
2. NSP-96-202, "Northern Power Company Prairie Island Units 1 and 2 10 CFR 50.46 Annual Notification and Reporting," February 20, 1996.
3. 95NS-G-0021, "Updated UPI LBLOCA," March 24, 1995.
4. WCAP-13919, Addendum 1, "Prairie Island Units 1 and 2 WCOBRA/TRAC Best Estimate UPI Large Break LOCA Analysis Engineering Report Addendum 1: Updated Results," December 1996.