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SUBJECT: Discusses KNPP ECCS analysis.

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December 6, 1994

10 CFR 50.46

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Ladies/Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Emergency Core Cooling System Analysis

Reference : Westinghouse Nuclear Safety Advisory Letter (NSAL) 94-22AA "SBLOCTA Axial Nodalization" dated October 25, 1994

On November 7, 1994, Wisconsin Public Service Corporation (WPSC) received notification from the Westinghouse Electric Corporation of several model refinements that have been implemented for the SBLOCTA computer code. The SBLOCTA code is part of the NOTRUMP ECCS Evaluation Model used to perform the Analysis of Record (AOR) for the small break loss of coolant accident (SBLOCA) at the Kewaunee plant. The net effect of these model changes is a reduction in fuel peak clad temperature (PCT) for the Kewaunee limiting small break transient, the three inch break, and increased margin to the maximum permissible PCT of 2200°F.

The model refinements are described below:

1) Axial Nodalization of Fuel Rod - Sensitivity studies varying the number and distribution of axial nodes from the assumptions of the standard rod model indicated that the nodalization for the standard rod model had a significantly non-conservative behavior with respect to peak clad temperature. Westinghouse attributes this behavior to a net increase in single-phase steam enthalpy rise as these nodes uncover sooner and heat up more than coarser nodes partially covered by the mixture level. Westinghouse has established a revised standard for rod nodalization to address this issue.

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A001

As a result of further investigation into the SBLOCTA code, several additional related issues associated with nodalization and solution of the fluid conservation equations were subsequently identified and corrected

2) Calculation of Transient Fuel Rod Internal Pressure - Westinghouse has implemented a revised model for calculating transient fuel rod internal pressure. The NRC was informed of this change per Westinghouse letter NTD-NRC-94-4253. Westinghouse intends to use this methodology improvement to the small break LOCA model on a forward-fit basis.

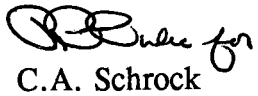
Westinghouse has estimated the net effect of these model changes to be $\Delta PCT = -33°F$. Thus, the peak clad temperature for the three inch break is reduced from 1053°F to 1020°F. The Small Break Peak Clad Temperature Margin Utilization summary sheet is enclosed as Attachment 1.

10CFR50.46(a)(3)(ii) requires that a licensee report within 30 days significant changes or errors in the ECCS evaluation model. A significant change or error includes one which is a cumulation of changes and errors such that the sum of the absolute magnitudes of the respective temperature changes is greater than 50°F. This requirement supports the need of the NRC to be informed of serious deficiencies in evaluation models regardless of their effect. Since the above described changes all relate to portions of the SBLOCTA code and/or its associated input methodology, Westinghouse estimated their impact as a single closely-related group of changes. Westinghouse was not able to determine the temperature impact of each change to permit WPSC to determine if this was a "significant" change. Therefore WPSC is conservatively submitting this report to fulfill the requirements of 10CFR50.46(a)(3)(ii).

The model changes result in a reduction in the limiting small break peak clad temperature and an increased margin to the maximum PCT of 2200°F permitted by 10CFR50.46(b)(1). Because of this, immediate action is not required; however, WPSC agrees that these code changes will be included in the next use of the NOTRUMP evaluation model for Kewaunee small break analyses.

If you have any questions, please contact a member of my staff.

Sincerely,



C.A. Schrock
Manager - Nuclear Engineering

RPP/san/Attach.

cc - US NRC Region III
US NRC Senior Resident Inspector

ATTACHMENT 1

Letter from C. A. Schrock (WPSC)

to

Document Control Desk (NRC)

Dated

December 6, 1994

Small Break Peak Clad Temperature Margin Utilization

Summary Sheet

Small Break Peak Clad Temperature Margin Utilization

Revision Date: 10/05/94

Plant Name: Kewaunee Unit 1
Utility Name: Wisconsin Public Service Corporation

Eval. Model: NOTRUMP Fuel: 14x14 Sieme
FQ=2.50 FΔH=1.70 SGTP = 25%

	Reference*	Clad Temperature		Notes
A. ANALYSIS OF RECORD (6/94)	1	PCT=	1053 °F	
B. PRIOR PERMANENT ECCS MODEL ASSESSMENTS	1	ΔPCT=	0 °F	
C. 10 CFR 50.59 SAFETY EVALUATIONS	Table A	ΔPCT=	0 °F	
D. 1993 10 CFR 50.46 MODEL ASSESSMENTS (Permanent Assessment of PCT Margin)				
1. Axial Nodalization, RIP Model Revision and SBLOCTA Error Corrections Analysis		ΔPCT=	−33 °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=**	**1020 °F**	

* References for the Peak Clad Temperature Margin Utilization summary 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:
None