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RC-06-0202

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir / Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
ECCS EVALUATION MODEL REVISIONS REPORT

References:

1. Westinghouse Letter, LTR-NRC-06-44, Transmittal of LTR-NRC-06-44 NP-Attachment, "Response to NRC Request for Additional Information on the Analyzed Break Spectrum for the Small Break Loss of Coolant accident (SBLOCA) NOTRUMP Evaluation Model (NOTRUMP EM), Revision 1" , (Non-Proprietary), dated July 14, 2006.
2. WCAP-10054-P-A, Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code, August 1985.
3. WCAP-10054-P-A, Addendum 2, Revision 1, Addendum to the Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code: Safety Injection into the Broken Loop and COSI Condensation Model, July 1997.

Attached is an updated Emergency Core Cooling System (ECCS) Evaluation Model Revisions Report for the Virgil C. Summer Nuclear Station (VCSNS). This report is being submitted pursuant to 10 CFR 50.46, which requires licensees to notify the NRC within 30 days of corrections to or changes in the ECCS Evaluation Models (EM) of greater than 50°F, and is applicable only to Small Break LOCA (SBLOCA).

This report addresses the effect of using a finer break spectrum (Reference 1). Attachment 1 described this change to the SBLOCA EM.

Using Westinghouse's latest SBLOCA EM (References 2 and 3), plant specific analyses were done to determine the quantitative effect of using a finer break spectrum. The analyses included a burnup study to determine the limiting time-in-life for hot rod peak clad temperature (PCT) and maximum local oxidation. The results of this work demonstrate continued 10 CFR 50.46 compliance, meeting both peak clad temperature and oxidation criteria.

A SBLOCA PCT sheet is included in Attachment II. As indicated, all previously reported PCT assessments were explicitly accounted for in the new analysis of record. The limiting break is a 2.75-inch diameter break in the cold leg with a peak clad temperature of 1952 °F. The VCSNS FSAR has been revised to reflect the results and conclusion of the new SBLOCA analysis of record.

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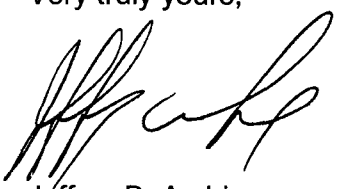
If you have any questions, please call Mr. Arnie Cribb at (803) 345-4346.

Very truly yours,



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MWD/JBA/mb
Attachments

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File (818.02-17, RR 8375)
DMS (RC-06-0202)

Attachment 1 – 10 CFR 50.46 Reporting Text

For

Appendix K Small Break - NOTRUMP Related Items

REFINED BREAK SPECTRUM

Background:

During the course of reviewing several extended power uprate and replacement steam generator SBLOCA analyses, the Nuclear Regulatory Commission (NRC) questioned the validity of the current practice where only integer break sizes are considered. The NRC was concerned that the resolution of the break spectrum used in the NOTRUMP EM (1.5, 2, 3, 4, and 6 inch cases) may not be fine enough to capture the limiting peak clad temperature as per 10 CFR 50.46. Therefore, the NRC issued a request for addition information (RAI) on the NOTRUMP EM standard break sizes analyzed.

In response to this, Westinghouse performed some preliminary work indicating that, in some cases, more limiting results could be obtained from non-integer break sizes. As a result, Westinghouse performed evaluations for plants that could potentially challenge the 50.46 acceptance criteria when considering a refined SBLOCA break spectrum. V. C. Summer was among the plants that were considered for this evaluation.

Affected Evaluation Model(s):

1985 Westinghouse Appendix K Small Break LOCA Evaluation Model

Estimated Effect:

A review of the V. C. Summer refined break spectrum evaluation results show that the limiting PCT of 1952 °F occurs for the 2.75-inch break at a burnup of 12,000 MWD/MTU. The limiting transient oxidation of 14.34% ECR (equivalent clad reacted) occurs for the 2.75-inch break at 14,000 MWD/MTU. Attachment 2 provides the revised SBLOCA PCT rack-up sheet that includes the refined break spectrum assessment.

Attachment 2 – SBLOCA PCT Rackup Sheet

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Name: V. C. Summer
Utility Name: South Carolina Electric & Gas
Revision Date: 10/30/2006

Analysis Information

EM:	NOTRUMP	**Analysis Date:**	2/13/2006	**Limiting Break Size:**	2.75 inch
FQ:	2.4	**FdH:**	1.62		
Fuel:	Vantage +	**SGTP (%):**	10		
Notes:					

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	**1952**	**8**	**(a)**
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . None	0		
C. 2006 ECCS MODEL ASSESSMENTS			
1 . None	0		
D. OTHER			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 1952		

References:

1 . CGE-94-205, "South Carolina Electric and Gas Company, Virgil C. Summer Station, 10 CFR 50.46 Notification and Reporting Information," February 8, 1994.

2 . CGE-94-228, "South Carolina Electric and Gas Company, Virgil C. Summer Station, SBLOCTA Axial Nodalization," October 27, 1994.

3 . CGE-95-201, "South Carolina Electric and Gas Company, Virgil C. Summer Station, 10 CFR 50.46 Notification and Reporting Information," February 3, 1995.

4 . CGE-96-202, "South Carolina Electric and Gas Company, Virgil C. Summer Station, 10 CFR 50.46 Annual Notification and Reporting," February 9, 1996.

5 . CGE-96-213, "South Carolina Electric and Gas Company, Virgil C. Summer Station, 10 CFR 50.46 Small Break LOCA Notification and Reporting," July 8, 1996.

6 . CGE-00-044, "South Carolina Electric and Gas Company, Virgil C. Summer Nuclear Station, 10 CFR 50.46 Appendix K (BART / BASH / NOTRUMP) Evaluation Model, Mid-Year Notification and Reporting for 2000," June 30, 2000.

7 . CGE-03-80, "10 CFR 50.46 Mid-Year Notification and Reporting for 2003," January 2004.

8 . LTR-LIS-06-344, "Transmittal of Updated V. C. Summer SBLOCA PCT Rackup Sheets," November, 2006.

Notes:

(a) The Rebaseline Analysis includes the impacts of the following model assessments:
1-LUCIFER Error Corrections (Ref. 1)
2-Effect of SI in Broken Loop (Ref. 1)
3-Effect of Improved Condensation Model (Ref. 1)
4-Axial Nodalization, RIP Model Revision and SBLOCTA Error Corrections Analysis (Ref. 2)
5-Boiling Heat Transfer Error (Ref. 3)
6-Steam Line Isolation Logic Error (Ref. 3)
7-NOTRUMP Specific Enthalpy Error (Ref. 4)
8-SALIBRARY Double Precision Error (Ref. 4)
9-SBLOCTA Fuel Rod Initialization Error (Ref. 5)
10-NOTRUMP Mixture Level Tracking / Region Depletion Errors (Ref. 6)
11-NOTRUMP Bubble Rise / Drift Flux Model Inconsistency Corrections (Ref. 7)
12-Refined Break Spectrum (Ref. 8)