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10CFR50.46

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Refer to: RC-94-0251

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

Gentlemen:

Subject: VIRGIL C. SUMMER NUCLEAR STATION  
DOCKET NO. 50/395  
OPERATING LICENSE NO. NPF-12  
10CFR 50.46 30 DAY REPORT (ANN 2300)

Westinghouse has recently provided South Carolina Electric & Gas Company (SCE&G) with a Nuclear Safety Advisory Letter documenting significant changes to the current ECCS Evaluation Model which are applicable to the Virgil C. Summer Nuclear Station (VCSNS). The first change is due to Boiling Heat Transfer Correlation Errors in which drift and slip errors for mixture velocity were not properly accounted for in NOTRUMP. The estimated effect of this change is -6° F on the Peak Cladding Temperature (PCT).

The second change is due to Steam Line Isolation Logic Errors and consists of two portions: a plant specific effect and a generic effect which applies to all previous analyses. Both of these effects are the result of incorrect logic that is inconsistent with the standard logic used in the analysis. The estimated effect of these changes is +12° F for the plant specific portion and +18° F for the generic portion for a total Steam Line Isolation Logic Error of +30° F.

The third change is due to a Core Node Zirc Oxide Initialization Error where incorrect initialization of the region specific fuel cladding zirc oxide thickness occurred within NOTRUMP. The estimated effect of this change is a net PCT change of 0° F.

In addition, a +24° F increase in the Burst and Blockage/Time in Life Penalty was included into the absolute value of the total PCT change. Attachments I, II, and III provide a more detailed technical description of these issues.

Attachment IV summarizes the collective impact of the ECCS Evaluation Model changes. These changes affect the Small Break Loss of Coolant Accident (SBLOCA) Model only and result in a net increase in PCT of 60° F. Based on these impacts, it is concluded that VCSNS' current Analysis of Record (2/93) remains conservative and continues to demonstrate compliance with 10 CFR 50.46 requirements.

However, the effects of the individual changes to the ECCS Evaluation Model has been determined to exceed 50° F and are thus significant in accordance with 10 CFR 50.46 (a)(3)(i). Consequently, this letter constitutes a 30 day report pursuant to 10 CFR 50.46 (a)(3)(ii) requirements.

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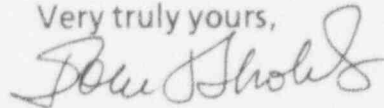
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The undersigned affirms that the statements and matters set forth herein are true and correct to the best of his knowledge, information, and belief.

Should you have any questions, please call Mr. Philip Rose at (803) 345-4052 at your convenience.

Very truly yours,



John L. Skolds

PAR/JLS/nkk  
Attachment

c: O. W. Dixon  
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File (813.12-4, 818.02-17)

## BOILING HEAT TRANSFER CORRELATION ERRORS

### Background

This closely related set of errors deals with how the mixture velocity is defined for use in various boiling heat transfer regime correlations. The previous definition for mixture velocity did not properly account for drift and slip effects calculated in NOTRUMP. This error particularly affected NOTRUMP calculations of heat transfer coefficient when using the Westinghouse Transition Boiling Correlation and the Dougall-Rohsenow Saturated Film Boiling Correlation.

In addition, a minor typographical error was also corrected in the Westinghouse Transition Boiling Correlation.

This was determined to be a Non-Discretionary Change as described in Section 4.1.2 of WCAP-13451 and was corrected in accordance with Section 4.1.3 of WCAP-13451.

### Affected Evaluation Model

1985 Small Break LOCA Evaluation Model

### Estimated Effect

Representative plant calculations for this issue resulted in the estimated PCT effect documented in the attached Margin Utilization Sheet.

## STEAM LINE ISOLATION LOGIC ERRORS

### Background

This error consists of two portions: a plant specific effect which applies to analyses which assumed Main Feedwater Isolation (FWI) to occur on S-signal, and a generic effect applying to all previous analyses.

The plant specific effect was the result of incorrect logic which caused the main steam line isolation to occur on the same signal as FWI. Therefore, when the S-signal was chosen through user input to be the appropriate signal for FWI, it also caused the steam line isolation to occur on S-signal. This is inconsistent with the standard conservative assumption of steam line isolation on Loss of Offsite Power coincident with the earlier Reactor Trip signal.

The generic effect was the result of incorrect logic which always led to the steam line isolation function occurring at a slightly later time than when the appropriate signal was generated.

This was determined to be a Non-Discretionary Change as described in Section 4.1.2 of WCAP-13451 and was corrected in accordance with Section 4.1.3 of WCAP-13451.

### Affected Evaluation Model

1985 Small Break LOCA Evaluation Model

### Estimated Effect

Representative plant calculations for this issue resulted in the estimated PCT effect (+ 12°F for the plant specific portion and + 18°F for the generic portion) documented in the attached Margin Utilization Sheet.

## CORE NODE ZIRC OXIDE INITIALIZATION ERROR

### Background

NOTRUMP models two regions for each core node analogous to the two (mixture and vapor) regions in adjoining fluid nodes. During the course of a transient, NOTRUMP tracks region specific quantities for each core node. Erroneous logic caused incorrect initialization of the region specific, fuel cladding zirc oxide thickness at times prior to the actual creation of the relevant region during the core boil off transient.

This was determined to be a Non-Discretionary Change as described in Section 4.1.2 of WCAP-13451 and was corrected in accordance with Section 4.1.3 of WCAP-13451.

### Affected Evaluation Model

1985 Small Break LOCA Evaluation Model

### Estimated Effect

Representative plant calculations led to an estimated generic PCT effect of 0°F for this effect.

## Small Break Peak Clad Temperature Margin Utilization

Revision Date: 08/10/94

Plant Name: Virgil C. Summer	Eval. Model: NOTRUMP	Fuel: Vantage +
Utility Name: South Carolina Electric & Gas	FQ = 2.45      FΔH = 1.62	SGTP = 25%

	Clad Temperature	Notes
A. ANALYSIS OF RECORD (2/93)	PCT = 1948°F	
B. PRIOR PERMANENT ECCS MODEL ASSESSMENTS	ΔPCT = -29°F	
C. 10 CFR 50.59 SAFETY EVALUATIONS	ΔPCT = 1°F	
D. 1994 10 CFR 50.46 MODEL ASSESSMENTS (Permanent Assessment of PCT Margin)		
1. Boiling Heat Transfer Correlation Error	ΔPCT = -6°F	
2. Steam Line Isolation Logic Error	ΔPCT = 30°F	
E. TEMPORARY ECCS MODEL ISSUES**		
1. None	ΔPCT = 0°F	
F. OTHER MARGIN ALLOCATIONS		
1. Burst and Blockage/Time in Life	ΔPCT = 139°F	1
 LICENSING BASIS PCT + MARGIN ALLOCATIONS	 PCT = 2083°F	

Notes:

1. This assessment is a function of base PCT plus permanent margin allocation and as such will increase/decrease with margin allocation changes.