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

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
10CFR50.46 Annual Report of Emergency Core Cooling System Model Revisions

References: 1) Correspondence from D. A. Leazar to NRC Document Control Desk, "10CFR50.46 Annual Report of ECC System Model Revisions," dated December 6, 1995 (ST-HL-AE-5247)

2) WCAP 13451, "Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting," October 1992

3) WCAP 10054 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," 1995

Pursuant to 10CFR50.46(a)(3)(ii), the South Texas Project submits this annual report concerning revisions to the accepted Emergency Core Cooling System evaluation model for South Texas Project Units 1 and 2. No changes were made to the Large Break Loss of Coolant Accident evaluation model during 1996. However, the following revisions have been made to the Small Break Loss of Coolant Accident evaluation model results:

Previous Small Break Loss of Coolant Accident Peak Cladding Temperature (from Reference 1)	2158°F
Correction of Typographical Error in NOTRUMP Code	+ 20 °F
Correction of SBLOCTA Code Error	+ 10 °F
Reduction of the Small Break Loss of Coolant Accident axial offset input from 20% to 13%	-30 °F
New Peak Cladding Temperature	2158 °F

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Project Manager on Behalf of the Participants in the South Texas Project

The new Peak Cladding Temperature remains below the 10CFR50.46 limit of 2200°F. Consequently, a reanalysis will not be performed.

Of the changes made in 1996, only the correction of the typographical error in the NOTRUMP code and the SBLOCTA code error correction are changes to the Small Break Loss of Coolant Accident evaluation model. The 30°F credit assigned to the reduction in the Small Break Loss of Coolant Accident axial offset input from 20% to 13% is not a change to the evaluation model as defined in WCAP 13451 (Reference 2). The reduction in the Small Break Loss of Coolant Accident axial offset input is a change in a plant specific input as defined in Item 11 on Page 10 of WCAP 13451. For the South Texas Project, the Large Break Loss of Coolant Accident analysis assumes an axial offset of 13%. The South Texas Project core designs ensure that this limit is not exceeded. The change in the axial offset assumption for the Small Break Loss of Coolant Accident analysis results in assumptions consistent with the Large Break Loss of Coolant Accident analysis and core design.

In 1993, Westinghouse identified a 150°F Peak Cladding Temperature benefit for the Small Break Loss of Coolant Accident analysis associated with the COSI improved condensation model. As stated in reference 1, the South Texas Project took the conservative position of not taking credit for the 150 °F benefit until NRC approval of the model. Based on limitations identified in the Safety Evaluation Report for WCAP 10054 Addendum 2 Revision 1 (Reference 3), the 150°F benefit does not apply to the South Texas Project.

If there are any questions regarding this matter, please contact either Mr. P. L. Walker at (512) 972-8392 or me at (512) 972-7795.

D. G. Leazar

D. A. Leazar
Director,
Nuclear Fuel and Analysis

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Attachments: 1. Changes to the Accepted Emergency Core Cooling System Models Since the Last 10CFR50.46 Annual Report

2. Current Large Break and Small Break Loss of Coolant Accident Emergency Core Cooling System Evaluation Model Peak Cladding Temperatures

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ATTACHMENT 1

CHANGES TO THE ACCEPTED EMERGENCY CORE COOLING SYSTEM
MODELS SINCE THE LAST 10CFR50.46 ANNUAL REPORT

CHANGES TO THE ACCEPTED EMERGENCY CORE COOLING SYSTEM MODELS SINCE THE LAST 10CFR50.46 ANNUAL REPORT

Since the last 10CFR50.46 annual report (Reference 1), Westinghouse has notified the South Texas Project of several items impacting the results of the Small Break Loss of Coolant Accident evaluation model. The items impacting the Small Break Loss of Coolant Accident evaluation model results are described below.

1) NOTRUMP Specific Energy Error

Westinghouse discovered a coding error in the NOTRUMP computer code. Westinghouse corrected the error as a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451. Correction of the error resulted in a calculated base Peak Cladding Temperature increase of 20°F. This item is a change to the Small Break Loss of Coolant Accident evaluation model.

2) SBLOCTA Code Fuel Rod Initialization Error

An error was discovered in the SBLOCTA code related to adjustments 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 had a small effect on the fuel rod initialization process, and could produce small effects during the transient. Due to the small magnitude of the effects, and the interaction between the two items, they were evaluated as a single, closely related effect, in accordance with WCAP 13451. Correction of the error resulted in a calculated base Peak Cladding Temperature increase of 10°F. This item is a change to the Small Break Loss of Coolant Accident evaluation model.

3) Reduction of the Small Break Loss of Coolant Accident Axial Offset Input

Westinghouse reviewed the inputs to the Small Break Loss of Coolant Accident analysis to determine if any excessive margin existed. Westinghouse determined that the axial offset input used in the Small Break Loss of Coolant Accident analysis was overly conservative. For the South Texas Project, axial offset is limited by the Large Break Loss of Coolant Accident value of +13%. This parameter is checked for each fuel cycle as part of the reload 10CFR50.59 evaluation. The Small Break Loss of Coolant Accident analysis axial offset input was reduced from +20% to +13% for consistency with the South Texas Project core design. Westinghouse performed an evaluation and determined that this reduction in the axial offset input from 20% to 13% results in at least a 30°F reduction in the calculated Small Break Loss of Coolant Accident Peak Cladding Temperature.

ATTACHMENT 2

CURRENT LARGE BREAK AND SMALL BREAK LOSS OF COOLANT ACCIDENT
EMERGENCY CORE COOLING SYSTEM EVALUATION MODEL PEAK
CLADDING TEMPERATURES

CURRENT LARGE BREAK AND SMALL BREAK LOSS OF COOLANT ACCIDENT EMERGENCY CORE COOLING SYSTEM EVALUATION MODEL PEAK CLADDING TEMPERATURES

The current Emergency Core Cooling System evaluation model Peak Cladding Temperatures are summarized below.

Large Break Loss of Cooling Accident

Previous Peak Cladding Temperature Result	2159°F
LUCIFER Error Benefit	0°F
	2159°F

Small Break Loss of Cooling Accident

Previous Peak Cladding Temperature Result	2158°F
Correction of Typographical Error in NOTRUMP Code	+ 20°F
Correction of SBLOCTA Code Error	+ 10°F
Reduction of the Small Break Loss of Coolant Accident Axial Offset Input from 20% to 13%	-30°F
	2158°F