WOLF CREEK
NUCLEAR OPERATING CORPORATION

March 19, 1996

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Vice President Plant Operations

WO 96-0047

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

Subject: Docket No. 50-482: 10 CFR 50.46 Annual Report of ECCS Model Changes

Gentlemen:

This letter describes changes to the Emergency Core Cooling System (ECCS) Evaluation Models and the estimated effect on the limiting ECCS analysis for Wolf Creek Generating Station (WCGS) in accordance with the criteria and reporting requirements of 10 CFR 50.46(a)(3)(i)and (ii), as clarified in Section 5.1 of WCAP-13451, "Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting." The changes in calculated Peak Cladding Temperatures (PCT) caused by the changes to Westinghouse ECCS Evaluation Models are reportable per 10 CFR 50.46 guidelines, as follows:

1. For Large Break Loss of Coolant Accident (LOCA), the net PCT effect of the evaluation model changes is 0 degrees Fahrenheit (^{o}F), for a net PCT of 1971.2 ^{o}F, which remains less than the 10 CFR 50.46 limit of 2200 ^{o}F.

2. For Small Break LOCA, the net PCT effect of the evaluation model changes is +20 ^{o}F, for a net PCT of 1590.6 ^{o}F, which remains less than the 10 CFR 50.46 limit of 2200 ^{o}F.

Attachment I describes the impact of the ECCS Evaluation Model changes. Attachment II contains the calculated Large Break LOCA and Small Break LOCA PCT margin allocations resulting from the permanent changes to the evaluation models. Since the PCT values determined in the Large Break and Small Break LOCA analysis of record, which combined with all the PCT margin allocations, remain well below the 2200 ^{o}F regulatory limit, no reanalysis will be performed.

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If you have any questions concerning this matter, please call me at (316) 364-8831, extension 4450, or Mr. Richard D. Flannigan at extension 4500.

Very truly yours,

Otto L. Maynard

OLM/jra

Attachments

cc: L. J. Callan (NRC), w/a
W. D. Johnson (NRC), w/a
J. F. Ringwald (NRC), w/a
J. C. Stone (NRC), w/a

ATTACHMENT I

CHANGES TO THE WESTINGHOUSE EMERGENCY CORE COOLING SYSTEM EVALUATION MODELS

Changes To The Westinghouse Emergency Core Cooling System Evaluation Models

Wolf Creek Nuclear Operating Corporation (WCNOC) has reviewed the annual 10 CFR 50.46 summary report of Emergency Core Cooling System (ECCS) Evaluation Model changes that were implemented by Westinghouse during 1995. The report includes information concerning changes to and errors discovered in the evaluation models. The review concludes that the cumulative effect of changes to, or errors in the evaluation models on the limiting transient Peak Cladding Temperature (PCT) is not significant. Therefore, reporting of the ECCS Evaluation Model changes may be submitted on an annual basis according to the reporting requirements set forth in 10 CFR 50.46(a)(3)(ii).

Attachment II provides an update of PCT margin rack-up for Wolf Creek Generating Station (WCGS). The PCT margin rack-up demonstrates that compliance with the requirements of 10 CFR 50.46 are maintained considering the combined effects of the ECCS Evaluation Model changes with the plant design changes performed under 10 CFR 50.59.

EVALUATION MODEL CHANGES

In addition to the significant change associated with the power shape assumption for the large break LOCA evaluation model, which was previously reported in WCNOC to NRC letter ET 95-0096, dated September 9, 1995, there was only one other model change in 1995 meeting the reporting criteria of 10 CFR 50.46. This is the NOTRUMP Specific Enthalpy Error discussed below.

NOTRUMP SPECIFIC ENTHALPY ERROR

Background

A typographical error was found in a line of coding in the NOTRUMP code. This line of coding was intended to model the calculation found in Equation L-127 of WCAP-10079-P-A. Although the equation in the topical report is correct, the coding represented the last term as a partial derivative with respect to the fluid node mixture region total energy instead of the mixture region total mass. This correction is a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model

1985 Westinghouse Small Break LOCA Evaluation Model Using NOTRUMP

Estimated Effect

Representative plant calculations have led to an estimated effect of +20°F for this error correction.

ATTACHMENT II

ECCS EVALUATION MODEL
PCT MARGIN ASSESSMENTS

*** Large Break LOCA PCT Margin Rack-Up Summary ***

A. ANALYSIS OF RECORD(1)

Evaluation Model:	1981 EM with BASH
Peaking Factor:	FQT=2.50, F_{dH}=1.65
SG Tube Plugging:	10%
Power Level/Fuel:	3565MW_t/17x17 V5H w/IFM, non-IFBA
Limiting transient:	C_D=0.4, Min. Safeguards, Reduced Tavg

Peak Cladding Temperature (PCT): 1916°F

B. PRIOR PERMANENT ECCS MODEL ASSESSMENTS	ΔPCT = -31°F
C. 10 CFR 50.59 EVALUATION	
1. RCS Loose Parts	ΔPCT = +20.2°F
D. 1995 10 CFR 50.46 MODEL ASSESSMENTS (Permanent Assessment of PCT Margin)	
1. Skewed Power Shape Penalty	ΔPCT = +152°F
2. Hot Leg Nozzle Gap Benefit	ΔPCT = -136°F
E. TEMPORARY USE OF PCT MARGIN	ΔPCT = 0°F
F. OTHER MARGIN ALLOCATIONS	
1. Transition Core (STD/V5H)	ΔPCT = +50°F(2)
2. Cold Leg Streaming Temperature gradient	ΔPCT = 0°F(3)
NET PCT Result	**PCT= 1971.2°F**

Notes:

(1) Based on the reanalysis that was performed to support the Wolf Creek Power Rerate Program.

(2) Transition core penalty applies on a cycle-specific basis for reloads utilizing both V5H (with IFMs) and STD fuel until a full core of V5H is achieved.

(3) A PCT benefit of < 2.5°F was assessed and will be tracked for reporting purposes.

*** Small Break LOCA PCT Margin Rack-Up Summary ***

A. ANALYSIS OF RECORD(1)		
Evaluation Model:	1985 EM with NOTRUMP	
Peaking Factor:	FQ=2.50, F_{dH}=1.65	
SG Tube Plugging:	10%	
Power Level/Fuel:	3565MW_t/17x17 V5H w/IFM,	
Limiting transient:	3-inch Break	
Peak Cladding Temperature (PCT):	1510°F	
B. PRIOR PERMANENT ECCS MODEL ASSESSMENTS		ΔPCT = +9°F
C. 10 CFR 50.59 EVALUATION		
1. RCS Loose Parts		ΔPCT = +44.6°F
D. 1995 10 CFR 50.46 MODEL ASSESSMENTS (Permanent Assessment of PCT Margin)		
1. NOTRUMP Specific Enthalpy Error		ΔPCT = +20°F
E. TEMPORARY USE OF PCT MARGIN		ΔPCT = 0°F
F. OTHER MARGIN ALLOCATIONS		
1. Cold Leg Streaming Temperature Gradient		ΔPCT = +7°F
NET PCT Result		**1590.6°F**

Notes:

(1) Based on the reanalysis that was performed to support the Wolf Creek Power Rerate Program.