

June 16, 2005  
GO2-05-108

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555-0001

**Subject: COLUMBIA GENERATING STATION, DOCKET NO. 50-397  
10 CFR 50.46 REPORT OF SIGNIFICANT CHANGES IN CYCLE 17 AND  
18 EMERGENCY CORE COOLING SYSTEM (ECCS) EVALUATION  
ANALYSIS**

Dear Sir or Madam:

Pursuant to 10 CFR 50.46(a)(3)(ii), Energy Northwest is hereby providing notification of changes in the calculated peak cladding temperature (PCT) of greater than 50 degrees F. The attached report is submitted to present the nature of the changes and the estimated effect. The changes in the attached report only affect the Framatome ANP analysis for ATRIUM-10 fuel. The Columbia Generating Station (Columbia) core consists of a mixture of Framatome ANP ATRIUM-10 and Westinghouse SVEA-96 fuel. Framatome ANP methodology was used to evaluate the ATRIUM-10 fuel in the Columbia core. The Westinghouse methodology used to evaluate the SVEA-96 fuel in the Columbia core is not affected by the changes discussed in the attached report.

The analyses are produced and reported separately for single loop operation (SLO) and two loop operation (TLO) within the approved methodology. The impact of the most recent error (i.e., the error described as error 3 in the attached report) exceeds 50 degrees F for the TLO loss of coolant accident case and the accumulation of this most recent error and previous errors exceed 50 degrees F for the SLO case. Columbia continues to meet the ECCS performance requirements set forth in 10 CFR 50.46(b). The bounding licensing basis PCT is now estimated to be 1604 degrees F which remains well below the acceptance limit of 2200 degrees F. As a result of these corrections, the TLO case has become the bounding case for Columbia. In addition to providing notification of these changes, the attached report provides the schedule for re-analysis to correct the error. The re-analysis will be performed for the Cycle 18 core design.

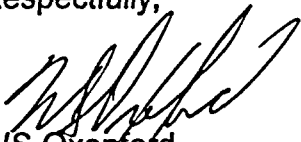
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If you have any questions or require additional information, please contact Mr. MK Brandon at (509) 377-4758.

Respectfully,



WS Oxenford  
Vice President, Technical Services  
Mail Drop PE04

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Attachment: 10 CFR 50.46 Thirty-Day Report for Changes to the Columbia ECCS  
Performance Analysis

cc: BS Mallett – NRC RIV  
BJ Benney – NRC NRR  
NRC Sr. Resident Inspector – 988C  
RN Sherman – BPA/1399  
WA Horin – Winston & Strawn

# 10 CFR 50.46 REPORT OF SIGNIFICANT CHANGES IN CYCLE 17 AND 18 EMERGENCY CORE COOLING SYSTEM (ECCS) EVALUATION ANALYSIS

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## 10 CFR 50.46 Thirty-Day Report for Changes to the Columbia ECCS Performance Analysis

### Introduction

Framatome ANP is one of the fuel vendors that support the current emergency core cooling system (ECCS) analyses for Energy Northwest. Framatome ANP has performed core analysis calculations to demonstrate the Columbia ECCS performance conforms to 10CFR 50.46. Framatome ANP employs an acceptable evaluation model (Reference 1) consistent with 10 CFR 50, Appendix K. The NRC accepted Energy Northwest's use of this analytical method in License Amendment 185 (Reference 2). The identification of application errors has resulted in calculated peak cladding temperature (PCT) changes that exceed 50 degrees F. This report is made pursuant to 10 CFR 50.46(a)(3)(ii).

### Discussion of the Changes and Their Impact

The errors in the application of the approved methodology and their estimated impact on PCT are summarized for two-loop recirculation and the single-loop recirculation pump scenarios. This information is provided for both Cycle 17 and Cycle 18 in the following tables. Columbia Cycle 17 ended in May 2005. A new analysis was prepared in support of the ATRIUM-10 nuclear design for Cycle 18. Errors identified in the Cycle 17 analysis were corrected in the Cycle 18 analysis, except for Error 3 described below. The Cycle 17 Error 3 was discovered after completion of the Cycle 18 analysis. Since the plant is now in Cycle 18 operation, a re-analysis to correct this last error will only be done for Cycle 18. The results of the RELAX computer code described in Reference 1 were affected by these software and input errors.

Cycle 17 Analysis		
Description	ATRIUM-10 Two-Loop PCT / Estimated PCT Impact (°F)	ATRIUM-10 Single-Loop PCT / Estimated PCT Impact (°F)
Cycle 17 initial PCT	1404 / not applicable	1535 / not applicable
Previously reported error (Reference 3)	1408 / 4	1535 / 0
Error 1: Recirculation loop flow- mismatch was 5.3% rated recirculation flow instead of 5.0% as specified by Columbia	1408 / 0	not applicable
Error 2: Critical Power Ratio (CPR) correlation coding was not consistent with the SPCB topical methodology (Reference 4)	1408 / 0	1516 / -19

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<b>Cycle 17 Analysis</b>		
<b>Description</b>	<b>ATRIUM-10 Two-Loop PCT / Estimated PCT Impact (°F)</b>	<b>ATRIUM-10 Single-Loop PCT / Estimated PCT Impact (°F)</b>
Error 3: Input automation incorrectly created duplicate flow paths from the core bypass region to the reactor vessel lower plenum. This increased flow into the lower plenum which can result in earlier core re-flood and lower PCT	1566 / 158	1561 / 45
Cycle 17 final estimated PCT and the cumulative error impact	1566 / 162	1561 / 64

<b>Cycle 18 Analysis</b>		
<b>Description</b>	<b>ATRIUM-10 Two-Loop PCT / Estimated PCT Impact (°F)</b>	<b>ATRIUM-10 Single-Loop PCT / Estimated PCT Impact (°F)</b>
Cycle 18 initial PCT	1446 / not applicable	1556 / not applicable
Error: Same as Cycle 17 Error 3 above (current cycle 18 PCT estimate)	1604 / 158	1601 / 45

Schedule for Re-Analysis

Re-analysis of the ECCS performance evaluation is in progress. The new analysis will be completed by July 29, 2005.

References

1. EMF-2361(P) (A) Revision 0, EXEM BWR-2000 ECCS Evaluation Model, Framatome ANP, May 2001.
2. Letter GI2-03-027, dated May 12, 2003, NRC to Energy Northwest, "Columbia Generating Station - Issuance of Amendment Re: The Addition of Depleted Uranium to the Fuel Assembly Composition Described in Technical Specifications 4.2.1 and 5.6.5.b (TAC NO. MB6319)"

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3. Letter GO2-04-025, dated February 25, 2004, Energy Northwest to NRC, "Columbia Generating Station, Docket No. 50-397, Independent Spent Fuel Storage Installation, Docket No. 72-35, 2003 Annual Operating Report"
4. EMF-2209(P)(A) Revision 2, SPCB Critical Power Correlation, Siemens Power Corporation, September 2003