



ENERGY NORTHWEST

Sudesh K. Gambhir
Vice President, Engineering
P.O. Box 968, Mail Drop PE04
Richland, WA 99352-0968
Ph. 509-377-8313 F. 509-377-2354
sgambhir@energy-northwest.com

April 5, 2011
GO2-11-072

10 CFR 50.46(a)(3)(ii)

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

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397
10 CFR 50.46 REPORT OF CHANGES OR ERRORS IN ECCS LOCA
ANALYSIS MODELS**

Dear Sir or Madam:

This report is provided in accordance with 10 CFR 50.46(a)(3)(ii), which requires (in part) annual reporting of changes to or errors in evaluation models used for calculating Emergency Core Cooling System (ECCS) performance, and an estimate of their effect on the limiting ECCS analysis.

The Columbia Generating Station (Columbia) core consists of a mixture of AREVA ATRIUM-10 and Global Nuclear Fuels (GNF) GE14 fuel. The attached report provides the details related to one change and one error affecting the analysis related to the ATRIUM-10 fuel for the reporting period through December 31, 2010. AREVA methodology was used to evaluate the ATRIUM-10 fuel in the Columbia core. The impact of the error to the analysis of record Peak Cladding Temperature (PCT) has been estimated to be 0°F. The impact of the change to the methodology has resulted in a decrease of 1°F in PCT from the analysis of record.

There have been no reported errors or changes to the methodology used to evaluate the GE14 fuel in the Columbia core during this reporting period.

The reported estimated licensing basis PCT remains within the acceptance criteria set forth in 10 CFR 50.46 (i.e., $\leq 2200^{\circ}\text{F}$). Thus, the current licensing basis PCT remains valid and no further actions are required. This letter meets the annual reporting requirements.

No regulatory commitments are contained in this letter.

A002
NRR

**10 CFR 50.46 REPORT OF CHANGES OR ERRORS IN ECCS LOCA ANALYSIS
MODELS**

Page 2

Please refer any questions regarding this submittal to MA Huiatt, Principal Engineer –
Licensing, at (509) 377-4243.

Respectfully,



SK Gambhir
Vice President, Engineering

Attachment – 10 CFR 50.46 Report of Changes or Errors in ECCS LOCA Analysis
Models

cc: NRC Region IV Administrator
NRC NRR Project Manager
NRC Senior Resident Inspector/988C
RN Sherman - BPA/1399
WA Horin - Winston & Strawn

10 CFR 50.46 REPORT OF CHANGES OR ERRORS IN ECCS LOCA ANALYSIS MODELS

Attachment

Page 1 of 2

The changes and errors in Emergency Core Cooling System (ECCS) performance models for 2010 are provided in compliance with 10 CFR 50.46(a)(3)(ii).

AREVA NP (formerly Framatome ANP) is one of the fuel vendors that support the current emergency core cooling system (ECCS) analyses for Columbia Generating Station (Columbia). AREVA has performed core analysis calculations to demonstrate the Columbia ECCS performance conforms to 10 CFR 50.46. AREVA 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 for ATRIUM-10 fuel in License Amendment 185 (Reference 2). There was one error discovered in the AREVA ECCS Loss of Coolant Accident (LOCA) analysis model and one change to the model in 2010. The error (Reference 3) identified array index issues in the RELAX code. The RELAX code is part of the EXEM BWR-2000 LOCA methodology used for LOCA analysis for the ATRIUM-10 fuel in the Columbia core. The impact of this error has been assessed with a corrected version of RELAX. Based on an assessment of Columbia break spectrum calculations, the impact on the analysis of record (Reference 5) Peak Clad Temperature (PCT) is estimated to be 0°F.

The change to the AREVA analytical method involves a new approach for calculating radiation view factors which was implemented in the HUXY computer program (Reference 4). The HUXY code is part of the EXEM BWR-2000 LOCA methodology used for LOCA analysis for the ATRIUM-10 fuel for Columbia. The change resulted in a decrease of 1°F in PCT from the analysis of record (Reference 5).

The SAFER/GESTR-LOCA analysis methodology for GE14 fuel was approved by the NRC for use at Columbia with the approval of license Amendment 211 (Reference 7). No errors or changes have been identified with this LOCA analysis model for Columbia since approval was received from the NRC (Reference 6).

The following Table is a summary of the evaluated effective Licensing Basis PCT including changes and errors for the reporting period through December 31, 2010.

Fuel Type	Licensing Basis PCT	Cumulative Incremental Change in PCT	Estimated PCT	Estimated PCT \leq 2200°F
Atrium-10	1604°F	-1°F	1603°F	Yes
GE14	1710°F	N/A	1710°F	Yes

References:

1. EMF-2361(P)(A) Revision 0, EXEM BWR-2000 ECCS Evaluation Model, Framatome ANP, May 2001

10 CFR 50.46 REPORT OF CHANGES OR ERRORS IN ECCS LOCA ANALYSIS MODELS

Attachment

Page 2 of 2

2. Letter GI2-03-072, 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)"
3. AREVA Engineering Information Record No: 51 - 9133676 - 000, "10 CFR 50.46 PCT Error Reporting for Columbia Generating Station (CR 2010-312)," March 2010
4. AREVA Engineering Information Record No: 51 - 9143786 - 000, "10 CFR 50.46 PCT Model Change Reporting for Columbia Generating Station," August 2010
5. EMF-3172(P) Revision 1, "Columbia Generating Station LOCA-ECCS Analysis MAPLHGR Limit for ATRIUM™-10 Fuel", Framatome ANP, June 2005
6. 0000-0098-0322-SRLR, Revision 0, "Supplemental Reload Licensing Report for Columbia Reload 19 Cycle 20," March 2009
7. Letter GI2-09-065, dated May 5, 2009, NRC to Energy Northwest, "Columbia Generating Station – Issuance of Amendment Re: Core Operating Limits Report and Scram Time Testing (TAC No. MD9247)