

# **ENERGY NORTHWEST**

P.O. Box 968 ■ Richland, Washington 99352-0968

October 17, 2001  
GO2-01-141

Docket No. 50-397

Ellis W. Merschoff  
U.S. Nuclear Regulatory Commission  
611 Ryan Plaza Dr.  
Suite 400  
Arlington, TX 76011-8064

Dear Mr. Merschoff:

**Subject: COLUMBIA GENERATING STATION, OPERATING LICENSE NPF-21,  
VIOLATION OF LICENSE CONDITION 2.C(1), MAXIMUM POWER  
LEVEL**

Pursuant to Columbia Generating Station Facility Operating License section 2.F, this followup report is submitted to detail the condition reported via telephone to the NRC Region IV Regional Administrator's designee on October 3, 2001. This condition was also voluntarily reported to the NRC Operations Center on the same date and is documented in event number 38345.

Columbia Generating Station may have exceeded its maximum core thermal power level due to an errant constant in the calculation used to determine core thermal power. This calculated value of core thermal power is used by control room operators to maneuver the plant to desired power levels. The calculation is performed by the plant process computer to determine core thermal power based on a system heat balance. General Electric (GE) report titled, "Impact of Steam Carryover Fraction on Process Computer Heat Balance Calculations", September 2001, documents a non-conservative constant that may be in use for moisture carryover fraction in the equation used to calculate plant heat balance. The carryover fraction term represents the portion of flow leaving the reactor pressure vessel that is still in the liquid phase. The GE report states that measurements performed over the past 5 years have shown that steam carryover is close to zero for BWR/4 and later designs. Some of these later designs of GE BWR plants have reported measured carryover fractions of less than 0.003%.

Based on the GE steam dryer design specifications, Columbia Generating Station has traditionally used 0.1% for the carryover term in the heat balance calculation. Use of the 0.1% term in the heat balance calculation results in a calculated value of core thermal power that is less than the value that would result from using the moisture carryover fraction value of 0.003% or less mentioned in the GE report.

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**VIOLATION OF LICENSE CONDITION 2.C(1)**

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Calculating core thermal power in this fashion may have resulted in Columbia Generating Station exceeding the maximum core thermal power value of 3486 MWt specified in license condition 2.C(1) by a maximum of 2.83 MWt or 0.08%. Until further analysis determines our plant specific moisture carryover fraction, Columbia Generating Station is using a conservative value of 0.0% for the moisture carryover term in plant process computer heat balance calculations.

The non-conservatism in calculated core thermal power introduced by the errant 0.1% value is an order of magnitude less than the precision of the Minimum Critical Power Ratio safety limit evaluation process. Additionally, power levels assumed in transient analyses performed to determine operating cycle thermal limits at Columbia Generating Station are significantly greater than power levels calculated using the 0.1% carryover term. Therefore, past use of the errant moisture carryover fraction of 0.1% has not resulted in a significant approach to a core thermal limit and does not represent a safety issue.

Should you have any questions or desire additional information regarding this matter, please call Mr. RN Sherman at (509) 377-8616.

Respectfully,

Handwritten signature of W. W. Coleman in cursive script.

RL Webring  
Vice President, Operations Support/PIO  
Mail Drop PE08

cc: WB Jones - NRC-RIV  
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