

September 8, 2006

Mr. James A. Gresham, Manager  
Regulatory Compliance and Plant Licensing  
Westinghouse Electric Company  
P.O. Box 355  
Pittsburgh, PA 15230-0355

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION (RAI) REGARDING  
WESTINGHOUSE ELECTRIC COMPANY TOPICAL REPORT (TR)  
WCAP-16523P, "WESTINGHOUSE CORRELATIONS WSSV AND WSSV-T  
FOR PREDICTING CRITICAL HEAT FLUX IN ROD BUNDLES WITH  
SIDE-SUPPORTED MIXING VANES" (TAC NO. MD0561)

Dear Mr. Gresham:

By letter dated March 17, 2006, Westinghouse Electric Company submitted for U.S. Nuclear Regulatory Commission (NRC) staff review TR WCAP-16523P, "Westinghouse Correlations WSSV and WSSV-T for Predicting Critical Heat Flux in Rod Bundles with Side-Supported Mixing Vanes." The NRC staff has identified a number of items for which responses to the enclosed RAI questions are needed to continue its review.

In our acceptance letter for TR WCAP-16523P, the NRC staff anticipated issuing its draft safety evaluation by February 28, 2007. To support this date, in email correspondence between Mr. William Slagle, Senior Fuel Licensing Engineer for Nuclear Fuels and I, it was agreed upon that the NRC staff will receive your responses to the enclosed RAI questions by September 30, 2006. Please call me at 301-415-1119, if you have any questions on this issue.

Sincerely,

**/RA/**

Jon H. Thompson, Project Manager  
Special Projects Branch  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Project No. 700

Enclosure: RAI questions

cc w/encl:

Mr. Gordon Bischoff, Manager  
Owners Group Program Management Office  
Westinghouse Electric Company  
P.O. Box 355  
Pittsburgh, PA 15230-0355

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DATE	9/6/06	9/5/06	9-8-06

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REQUEST FOR ADDITION INFORMATION

BY THE OFFICE OF NUCLEAR REACTOR REGULATION

TOPICAL REPORT WCAP-16523-P

"WESTINGHOUSE CORRELATIONS WSSV AND WSSV-T FOR PREDICTING CRITICAL

HEAT FLUX IN ROD BUNDLES WITH SIDE-SUPPORTED MIXING VANES"

(TAC NO. MD0561)

1. On page 23 of 124, the B-array index shown in the top equation is not consistent with the index value for the same equation elsewhere in the report. Correct as appropriate.
2. On page 24 of 124, define the following terms in the equation for  $F_C$ :  
$$q_c \left( \frac{l_{crit}}{z} \right)_{CHF,NU}$$
 (not defined until page 36 of 124)
3. On page 24 of 124, the only parts of the last equation previously considered proprietary are the leading coefficient and the exponents, see for example page 5-5 in CENPD-387-NP-A, REV. 000, "ABB Critical Heat Flux Correlations for PWR Fuel." Correct as appropriate and define any new terms.
4. The term  $F_C$ , to correct for non-uniform shapes, includes an empirical term "C" taken from CENPD-387-P-A, "ABB Critical Heat Flux Correlations for PWR Fuel." The parameter ranges have been expanded in the current proposal as compared to the previous study, most notably in the local coolant quality. Provide an explanation, or re-evaluate the empirical term "C" to cover the new parameter range, justifying the use of this term for cases outside the original parameter ranges used to develop "C."
5. The base ABB-NV and ABB-TV correlations (CENPD-387) did not include a factor to extend the correlation to higher qualities. The break point selected overlaps the previous data. Provide a discussion for how the break point was selected.
6. On page 38 of 124, it is stated "After the initial runs, the code *could* {emphasis added} have been used to separate out outliers, following the procedure described in Section 5. No points in the correlation database were rejected by this procedure as outliers." In Section 5, page 56 of 124, it is stated "As stated in Section 4, no points from the correlation or validation databases were eliminated." Clarify the actual procedure used to determine that no points in the data base were identified as outliers.
7. On page 56 of 124, should the equation for W be  $b^2/S^2$  (b-squared divided by s-squared)?

ENCLOSURE