May 22, 2003

Mr. Gordon Bischoff
Manager, Owners Group Programs
Westinghouse Electric Company
2000 Day Hill Road,
Windsor, CT 06095

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION RELATED TO THE WESTINGHOUSE CENTS TOPICAL REPORT (TAC NO. MB6982)

Dear Mr. Bischoff**:**

By letter dated December 13, 2002, the Combustion Engineering Owners Group (CEOG), submitted for the NRC staff review WCAP-15996-P, Rev. 0, Volumes 1-3, "Technical Description Manual for the CENTS Code." This topical report was prepared by Westinghouse Electric Company LLC (Westinghouse). Consistent with its prior approved versions of CENTS, it was requested that the NRC review and approve WCAP-15996-P, Rev. 0 for continued application to both Combustion Engineering- and Westinghouse-designed pressurized water reactors.

WCAP-15996-P, Rev. 0 documents changes made to the CENTS methodology and incorporates a number of minor changes to cleanup and clarify the methodology. The staff has reviewed this submittal and has had several teleconferences with Westinghouse, the last conducted on May 9, 2003. The staff has determined that additional information is needed to complete our review. A request for additional information is enclosed. This request was discussed with Virgil Paggen of your staff on May 9, 2003, and it was agreed that a response would be provided within 30 days of receipt of this letter.

If you have any questions, please contact me at (301) 415-1436.

Sincerely,

/RA/

Drew G. Holland, Project Manager, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Project No. 694

Enclosure: Request for Additional Information

cc w/encl: See next page

May 22, 2003

Mr. Gordon Bischoff
Manager, Owners Group Programs
Westinghouse Electric Company
2000 Day Hill Road,
Windsor, CT 06095

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION RELATED TO WESTINGHOUSE CENTS TOPICAL REPORT (TAC NO. MB6982)

Dear Mr. Bischoff**:**

By letter dated December 13, 2002, the Combustion Engineering Owners Group (CEOG), submitted for the NRC staff review WCAP-15996-P, Rev. 0, Volumes 1-3, "Technical Description Manual for the CENTS Code." This topical report was prepared by Westinghouse Electric Company LLC (Westinghouse). Consistent with its prior approved versions of CENTS, it was requested that the NRC review and approve WCAP-15996-P, Rev. 0 for continued application to both Combustion Engineering- and Westinghouse-designed pressurized water reactors.

WCAP-15996-P, Rev. 0 documents changes made to the CENTS methodology and incorporates a number of minor changes to cleanup and clarify the methodology. The staff has reviewed this submittal and has had several teleconferences with Westinghouse, the last conducted on May 9, 2003. The staff has determined that additional information is needed to complete our review. A request for additional information is enclosed. This request was discussed with Virgil Paggen of your staff on May 9, 2003, and it was agreed that a response would be provided within 30 days of receipt of this letter.

If you have any questions, please contact me at (301) 415-1436.

Sincerely,
/RA/
Drew G. Holland, Project Manager, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Project No. 694

Enclosure: Request for Additional Information

cc w/encl: See next page

DISTRIBUTION:
PUBLIC
RidsNrrPMDHolland
RidsNrrLAEPeyton
RidsAcrsAcnw
PDIV-2 Reading
RidsNrrPMAWang
RidsOgcRp
JWermiel

ADAMS Accession No.: ML031420828 **NRR-088**

OFFICE	PDIV-2/PM	PDIV-2/LA	PDIV-2/PM	PDIV-2/SC
NAME	AWang	EPeyton	DHolland	SDembek
DATE	5/21/03	5/21/03	5/21/03	5/21/03

DOCUMENT NAME: C:\ORPCheckout\FileNET\ML031420828.wpd OFFICIAL RECORD COPY

cc:
Mr. Hank A. Sepp, Manager
Regulatory and Licensing Engineering
Westinghouse Electric Company
Mail Stop WEC E 4-7A
P.O. Box 355
Pittsburgh, PA 15230-0355

Mr. Ian C. Rickard, Project Manager
Windsor Nuclear Licensing
Westinghouse Electric Company
Mail Stop 6009-0420
Windsor, CT 06095-0500

Mr. Charles B. Brinkman, Director
Washington Operations
Westinghouse Electric Company
12300 Twinbrook Parkway, Suite 330
Rockville, MD 20852

Mr. Virgil A. Paggen, Licensing Project Engineer
Westinghouse Electric Company LLC
Mail Stop 6009 - 420
2000 Day Hill Road
Windsor, CT 06095-0500

REQUEST FOR ADDITIONAL INFORMATION

WCAP-15996-P, REV. 0, "TECHNICAL DESCRIPTION MANUAL

FOR THE CENTS CODE"

PROJECT NO. 700

CENTS is a computer code for the simulation of pressurized water reactors (PWRs) transient behavior under normal and abnormal conditions. CENTS is intended to be used for prediction of plant behavior for conditions ranging from normal plant operation to operational and licensing transients. WCAP-15996-P, Rev. 0 documents changes made to the CENTS methodology and incorporates a number of minor changes to cleanup and clarify the methodology. The staff has reviewed this submittal and has had several teleconferences with Westinghouse, the last conducted on May 9, 2003. The staff has determined that additional information is needed to complete our review.

The following questions are related to the main steamline and header model, Section 5.6:

1. Equation 5.33, on page 5-40 of Volume I of WCAP-15996-P, Rev. 0, is an equation for flow rate. However, the units of the equation do not result in flow rate units. Equation 5.36 results in break flow being in units of mass per length. Since this appears to be incorrect, please correct the documentation and coding as needed.

2. Should equation 5.54 be A11*Pj+A12*hj=A13? How do you get from "A13=..." at the bottom of page 5-50 to Equation 5.54?

The following questions are related to steam generator tube heat transfer, Section 5.3:

3. The last sentence of Section 5.3.2.2 states that if there is a tube rupture, then the flows are adjusted accordingly. Please expand on how the flows are adjusted.

4. Is W_i of Section 5.3.2.3 mass flow rate?

The following question is related to steam generator tube rupture model, Section 5.7:

5. The slot break model is described in Section 5.7.3. Does the code support flow from both tube sections out the slot break? Please clarify the meaning of the last sentence of Section 5.7.3.

The following question is related to feedwater line model, Section 5.5:

6. On page 5-23, the flow-squared term is linearized from the momentum equation. Please annotate the steps taken to arrive at each step listed.

The following questions are related to Volume 4 of WCAP-15996-P, Rev. 0:

7. Is the time of 668 seconds correct for the peak steam generator pressure on Table 2.2.2.B?

8. Please clarify the reason for the different trends observed on Figure 2.2.1.F.

9. What is the reason for the pressurizer pressure difference between the original version and the current version (models activated) in Figure 2.2.2.Q?

10. Is there actually a second y-axis in Figures 2.2.3.K and 2.2.4.K?

11. Please explain why the iteration described in the second paragraph of Section 3.4.1 is performed.

12. Please describe why there is 30 percent less break flow in the current version as compared to the original version as shown on Figure 3.2.2.K.

13. In most cases outlined in the roadmap, the changes which are requested to be reviewed did not result in changes to the outcome. For each case, please explain whether the reason for making the changes were not as important as originally expected, or if the code does not adequately predict the phenomena expected.