

February 26, 1997

Mr. Nicholas J. Liparulo, Manager  
Nuclear Safety and Regulatory Analysis  
Nuclear and Advanced Technology Division  
Westinghouse Electric Corporation  
P.O. Box 355  
Pittsburgh, PA 15230

SUBJECT: FOLLOWON QUESTIONS ON THE REVISED REPORT ON WCOBRA/TRAC  
APPLICABILITY TO AP600 LARGE-BREAK LOSS-OF-COOLANT ACCIDENT

Dear Mr. Liparulo:

Westinghouse letter NSD-NRC-96-4871, dated October 30, 1996, submitted Revision 1 to WCAP-14171, WCOBRA/TRAC Applicability to AP600 Large-Break Loss-of-Coolant Accident. The revision addresses previous NRC staff comments including those provided in an NRC letter to Westinghouse dated May 17, 1996. In addition, request for additional information (RAI) responses related to the revised WCAP were submitted by Westinghouse letter NSD-NRC-96-4908, dated December 19, 1996. Subsequently, the staff sent Westinghouse some additional questions in a letter dated January 3, 1997. The staff and Westinghouse have had a series of telephone conversations discussing the most recent set of questions. In its effort to complete the evaluation of WCOBRA/TRAC applicability of AP600, the NRC staff and its contractor at INEEL, have additional questions. These questions are included as an enclosure to this letter.

Many of the enclosed questions and comments may not merit the issuance of formal RAIs. To expedite the review process, Westinghouse is requested to provide brief written responses to each question which can then be used to support detailed discussions during telephone conversations or meetings. The staff expects that the enclosed questions will be included in the open item tracking system so that the status and disposition of these items can be tracked.

If you have any questions regarding this matter, you may contact me at (301) 415-1141.

Sincerely,

original signed by:

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William C. Huffman, Project Manager  
Standardization Project Directorate  
Division of Reactor Program Management  
Office of Nuclear Reactor Regulation

Docket No. 52-003

Enclosure: As stated

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Docket No. 52-003  
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ADDITIONAL COMMENTS ON THE REVIEW OF WESTINGHOUSE'S REPORT  
WCAP-14171-P, REVISION 1  
WCOBRA/TRAC APPLICABILITY TO AP600 LBLOCA

1. In a telephone conversation with Westinghouse, the possibility of Westinghouse writing a letter to clarify how the AP600 methodology (which includes some modifications to the approved best estimate methodology) meets the 14 steps of the Code Scaling, Applicability, and Uncertainty methodology<sup>1</sup> was discussed. The staff would find such a letter helpful in completing and documenting its review. Will Westinghouse commit to providing such a letter?
2.
  - a. The approved methodology presented sensitivity studies for time steps and burnup. Do any of these studies need to be redone for AP600 because of design differences or calculational differences that affect the results for AP600 relative to three- and four-loop plants? Please provide some justification with your answer.
  - b. What is the reference for the AP600 break spectrum study that identified the limiting break? Do any of the proposed methodology changes for AP600 impact the validity of the earlier study? Please provide some justification with your answer.
3. How will Westinghouse determine the ranges for the sensitivity studies on the AP600 bounded parameters (for example, the temperature ranges for accumulator water or plant average temperature)?
4.
  - a. Does Westinghouse use the approved version of WCOBRA/TRAC, WCOBRA/TRAC, MOD7A.Rev.1, in its AP600 analyses?
  - b. Are all AP600 design changes (relative to three- and four-loop plants) that are important to LBLOCA addressed through code input (for example, direct vessel injection and the accumulators)? That is, clarify that Westinghouse did not need to modify WCOBRA/TRAC, MOD7A.Rev.1, to analyze AP600.
5. Because of the simplifications to the approved methodology made for AP600, Westinghouse stated in WCAP-14171-P, Revision 1, that the validation and correction of the superposition assumptions in the approved methodology was not needed for the AP600. However, the models are still separated into global and local models and evaluated using different approaches. Was this separation also covered in the approved methodology superposition validation/correction? If yes, clarify how the AP600 methodology accounts for the need to validate/correct for this separation. If no, then clarify what was done in the approved methodology in this area.
6. In Attachment 1 of Reference 2, Westinghouse described a correction to the HOTSPOT standard deviation that was made to ensure the appropriateness of the results. It is the staff's understanding that this correction should be a part of the AP600 methodology. Clarify if this is true or explain why it is not needed for the AP600 methodology.

7. In WCAP-14171-P, Revision 1, Westinghouse stated that the WCOBRA/TRAC code uncertainty is kept as a lower limit on the uncertainty. In the approved methodology, the code uncertainty consisted of two parts that were compared to two different uncertainties, and one of those uncertainties is no longer directly included in the AP600 uncertainty methodology. Therefore, clarify how the code uncertainty is applied in the AP600 methodology. As a related question, if only the one part of the code uncertainty is retained in the AP600 methodology, clarify how Westinghouse's AP600 methodology accounts for the goodness of the WCOBRA/TRAC results relative to test data.
8. In WCAP-14171-P, Revision 1, the WCOBRA/TRAC analysis of Cylindrical Core Test Facility Run 58<sup>3</sup> did not calculate the oscillations observed in the test results. Clarify if this was due to the WCOBRA/TRAC analysis calculating that the downcomer level did not recover to the DVI nozzle elevation. If this was the case, clarify the reasons for the difference relative to the test data which did show the downcomer level recovering to the DVI nozzle elevation. If not, clarify the reasons for the WCOBRA/TRAC and test differences.

#### REFERENCES

1. B. Boyack, et al., Quantifying Reactor Safety Margins, Application of Code Scaling Applicability, and Uncertainty Evaluation Methodology to a Large-Break, Loss-of-Coolant Accident, NUREG/CR-5249, EGG-2552, December 1989.
2. N. J. Liparulo, Westinghouse, letter to USNRC Document Control Desk, "Docketing of Supplemental Information Related to WCAP-12945-P," NSD-NRC-96-4718, NSA-SAI-96-167, May 9, 1996.
3. J. Sugimoto, et al., Data Report on Large Scale Reflood Test-78, CCTF Core-II Test C2-AA2 (Run 058), JAERI Memo 59-446, February 1985.

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