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NTD-NRC-95-4608
DCP/NRC0437
Docket No.: STN-52-003

December 8, 1995

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTENTION: T. R. QUAY

SUBJECT: WESTINGHOUSE RESPONSES TO NRC REQUESTS FOR ADDITIONAL
INFORMATION ON THE AP600

Dear Mr. Quay:

Enclosed are three copies of the Westinghouse responses to NRC requests for additional information on the WCOBRA/TRAC computer code. A listing of the NRC requests for additional information responded to in this letter is contained in Attachment A.

These responses are also provided as electronic files in WordPerfect 5.1 format with Mr. Kenyon's copy. The Westinghouse Electric Corporation copyright notice, proprietary information notice, application for withholding and affidavit are also attached.

Please contact John C. Butler on (412) 374-5268 if you have any questions concerning this transmittal.

Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

/nja

Enclosures

Attachment

- cc: T. Kenyon, NRC (w/o Enclosures/Attachments)
- W. Huffman, NRC (1E1, 1E2)
- R. C. Jones, NRC (w/o Enclosures/Attachments)
- G. D. McPherson, NRC (w/o Enclosures/Attachments)
- F. Eltawila, NRC (w/o Enclosures/Attachments)
- L. Lois, NRC (1E1)
- P. Boehnert, ACRS (4E1)
- N. J. Liparulo, Westinghouse (w/o Enclosures/Attachments)

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Attachment A to NTD-NRC-95-4608
Enclosed Responses to NRC Requests for Additional Information

Re: WCOBRA/TRAC
440.345
440.357

Enclosure 1 TO NTD-NRC-95-4608

NRC REQUEST FOR ADDITIONAL INFORMATION



Question 440.345

Re: WCAP-14171 (WCOBRA/TRAC CAD)

Does the AP600 uncertainty discussed in Section 4 include the CCTF Run 58 peak cladding temperature (PCT) comparisons from WCAP-14171? If not, justify why.

Response:

The result of CCTF test 58 was not included in the uncertainty calculation given in Section 4 of the WCOBRA/TRAC CAD report (WCAP-14171). The reason for not including this particular test was that the code uncertainty had already been calculated before this test was analyzed. There are several different CCTF tests which are included in the code uncertainty calculation as given in the WCOBRA/TRAC Code Qualification Document, Section 19 of WCAP-12945-P. The final comparison of WCOBRA/TRAC to CCTF test 58 is given in the response to RAI 440.348. The calculated PCT at the six foot elevation was 1600 °F while the measured temperature at the same location was 1570 °F. The difference between the predicted and measured PCTs for CCTF test 58 lies within the range of measured PCT minus predicted PCT for the other CCTF tests analyzed with WCOBRA/TRAC in WCAP-12945-P. Since there is not a significant difference between the code prediction and the data for test 58, and since there is a large sample of code to data predictions for the reflood peak at the six-foot elevation (33 samples), the addition of test 58 to the data sample will not impact the code bias or code uncertainty. Therefore, this additional test is not included in the WCOBRA/TRAC code uncertainty.

SSAR Revision: NONE

NRC REQUEST FOR ADDITIONAL INFORMATION



Question 440.357

Re: WCAP-14171 (WCOBRA/TRAC CAD)

Westinghouse concluded in Section 4.1 that the WCOBRA/TRAC CQD uncertainty could be applied to AP600 because the AP600 LBLOCA transient is essentially the same as that for Westinghouse three- and four-loop plants. However, the AP600 downcomer nodalization is different from that used in the CQD code assessment analyses because of the direct vessel injection (DVI) lines. Also, the CQD assessments did not include any DVI cases. Because the AP600 downcomer nodalization is different and the CQD code assessment analyses did not include DVI cases, clarify if these differences affect the applicability of the CQD uncertainty to AP600? If yes, clarify what must be done, and justify it adequately accounts for the effects of these differences. If no, justify why not.

Response:

This RAI is similar to 440.345. There was additional validation of WCOBRA/TRAC performed for the direct vessel injection difference of the AP600 relative to traditional cold leg injection which is used on conventional Westinghouse plants. Full scale Upper Plenum Injection Tests (UPTF) which modeled direct vessel injection were simulated using the same noding scheme as the AP600 plant. The assessment indicated that WCOBRA/TRAC would under-estimate the reactor vessel filling period or over-estimate ECC-bypass such that the code had a conservative bias for direct vessel injection, in the same manner that it has a conservative bias for cold leg injection. The one test which generated a PCT which could be compared to the code predictions is CCTF test 58. This test simulated the very end of blowdown with accumulator injection into the downcomer and the following reflood transient. The downcomer noding used for this experiment is the same as that used for the AP600 plant. The WCOBRA/TRAC calculated PCT for this test was 1600 °F as compared to the test data PCT of 1570 °F. Since this agreement is the same as the agreement for the other cold leg injection CCTF tests (see Table 19-3-4 of WCAP-12945-P, page 19-3-7), the uncertainty of the direct vessel injection prediction is within the uncertainty of the WCOBRA/TRAC predictions of the cold leg injection CCTF tests. Therefore, the uncertainty which has been derived for WCOBRA/TRAC can be applied for the AP600, and there is no additional uncertainty that need be considered for direct vessel injection.

SSAR Revision: NONE