

May 22, 2002

MEMORANDUM TO: Samuel J. Collins, Director
Office of Nuclear Reactor Regulation

FROM: Ashok C. Thadani, Director *Original signed by A. Thadani*
Office of Nuclear Regulatory Research

SUBJECT: REQUEST FOR TECHNICAL SUPPORT IN AP1000 PHASE 3
REVIEW

The purpose of this memorandum is to inform you of the Office of Nuclear Regulatory Research's plans to assist NRR during Phase 3 of the AP1000 review. Consistent with the request in Reference 1, RES will:

1. Assist in the review of revisions to the WCOBRA/TRAC computer code by Westinghouse to calculate liquid entrainment in the hot legs and in the ADS-4 for small break LOCA analysis. It is our understanding that WCOBRA/TRAC calculations will be used to justify the net entrainment to the ADS-4 calculated by the NOTRUMP code. RES will recommend RAIs to NRR/SRXB on this subject area by 8/01/2002 provided that the Westinghouse topical report on applicability of WCOBRA/TRAC is received by 5/31/2002.
2. Assist in review of the experimental basis that Westinghouse will use to support the liquid entrainment models in WCOBRA/TRAC. Our review will include a discussion of the prototypicality of the experimental facilities to the conditions expected during a hypothetical small break LOCA in the AP1000. RES will recommend RAIs to NRR/SRXB by either 8/01/02 or within 45 days following receipt of all relevant Westinghouse submittals, which ever comes later. It is our understanding that Westinghouse has not yet committed to a firm date to submit a topical report discussing entrainment and ADS-4 performance in AP1000.
3. Provide consultation and support to NRR for items 1 and 2 including presentations to the ACRS and appropriate subcommittees throughout issuance of the Final Safety Evaluation Report.

For both Items 1 and 2, RES will provide draft SER input by 3/15/2003.

Specific tasks to be performed by RES in order to satisfy these requests include:

- (a) A review and technical evaluation of the correlation(s) used in WCOBRA/TRAC to calculate the net entrainment to the ADS-4. This will include correlations for pool entrainment and entrainment from horizontal stratified flows, as appropriate.
- (b) A review of the experimental data used to develop the correlation(s) used by WCOBRA/TRAC, and the adequacy of the experimental facilities for which that data were obtained.

(c) Development of correlation(s) using data from the ATLATS facility and on-going RES confirmatory research on phase separation in tees. The correlations obtained from this investigation will be compared to those used by Westinghouse for AP1000 analysis.

(d) The sensitivity of the AP1000 to hot leg entrainment and carryover to the ADS-4 during a small break LOCA (SBLOCA) will be investigated by simulating various SBLOCA scenarios using a code version with the phase separation models developed from the ATLATS data. This will be used to help judge the adequacy of the WCOBRA/TRAC models.

Our staffs are currently coordinating another user need for AP1000 severe accident issues including containment response. We may consider additional containment analyses when we respond to that forthcoming user need.

REFERENCES:

[1] Memorandum from S. J. Collins, Director, NRR to A. C. Thadani, Director, RES, "User Need Request - AP1000 Design Certification," NRR-2002-029, April 25, 2002.

(c) Development of correlation(s) using data from the ATLATS facility and on-going RES confirmatory research on phase separation in tees. The correlations obtained from this investigation will be compared to those used by Westinghouse for AP1000 analysis.

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[1] Memorandum from S. J. Collins, Director, NRR to A. C. Thadani, Director, RES, "User Need Request - AP1000 Design Certification," NRR-2002-029, April 25, 2002.

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