June 6, 2003

Mr. W. E. Cummins, Director
AP600 & AP1000 Projects
Westinghouse Electric Company
P.O. Box 355
Pittsburgh, PA 15230-0355

Dear Mr. Cummins:

As you are aware, the U.S. Nuclear Regulatory Commission (NRC) staff is preparing the draft safety evaluation report (DSER) for the AP1000 design certification application submitted by Westinghouse Electric Company (Westinghouse) on March 28, 2002. The staff expects to issue the DSER in June 2003. As of this date, the staff has identified four potential open items for DSER Chapter 21, "Testing and Computer Code Evaluation" which are enclosed for your information. Please note that the staff's review of the application will continue during preparation of the DSER, which may result in changes to the potential open items identified in the enclosure, or the addition of other open items.

Three of the potential open items in the enclosure have the original request for additional information (RAI) number included for reference. If the staff cannot resolve the potential open items before the issuance of the DSER, these items will be issued as DSER open items and be tracked with a corresponding open item number.

Previously, Westinghouse committed to provide responses to all identified open items within 9 weeks after the issuance of the DSER. The staff will be prepared to review your responses to the open items and have conference calls and meetings with your staff, as appropriate, after the DSER is issued. If Westinghouse chooses to address some or all of these open items before the issuance of the DSER, the staff may not have sufficient time to evaluate every response to the potential open items that Westinghouse submits to the NRC and make changes to the DSER before the scheduled DSER issuance in June 2003.

Please contact one of the following members of the AP1000 project management team if you have any questions or comments concerning this matter: Mr. John Segala (Lead Project Manager) at (301) 415-1858 or jps1@nrc.gov, Mr. Joseph Colaccino at (301) 415-2752 or jxc1@nrc.gov, or Ms. Joelle Starefos at (301) 415-8488 or jls1@nrc.gov.

Sincerely,

/RA/

James E. Lyons, Director
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

Docket No. 52-006

Enclosure: As stated

cc: See next page

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Westinghouse AP1000
Draft Safety Evaluation Report
Potential Open Items
Chapter 21
Testing and Computer Code Evaluation

Open Item Number: 21.1-1

Original RAI(s): N/A

Summary of Issue: This safety evaluation report provides the U.S. Nuclear Regulatory Commission (the NRC or staff) staff's assessment of the application, to the AP1000, of the AP600 passive core cooling system test program, and the LOFTRAN, NOTRUMP, and WCOBRA/TRAC analysis codes to the AP1000 standard plant design. The assessment of the AP1000 passive containment cooling system and the WGOTHIC code is addressed separately in this chapter. The staff's evaluation documented in this chapter concentrates on the differences between the AP1000 and the AP600 design with the understanding that the AP600 testing and computer codes were found to be acceptable in accordance with the staff's evaluation documented in Chapter 21 of NUREG-1512, "Final Safety Evaluation Report Related to Certification of the AP600 Standard Design," September 1998. This chapter currently contains references to NUREG-1512, which provides the basis for accepting the AP600 testing and computer codes. Prior to issuing the final safety evaluation report for the AP1000, the staff will remove these references and replace the references with the basis for its conclusion that the testing and computer codes are acceptable for the AP1000. This is DSER Open Item 21.1-1.

Open Item Number: 21.5-1

Original RAI(s): 440.151, 440.152, 440.154

Summary of Issue: The applicant's submittals and responses to RAIs concerning hot leg phase separation were not sufficient to demonstrate that the codes used in the AP1000 safety analysis model the hot leg phase separation process correctly. However, the sensitivity studies by the NRC staff to investigate the effect of modeling this process on important AP1000 transients indicated the effect to be relatively small. This issue is considered open until the applicant confirms the sensitivity studies performed by the staff using the code(s) the applicant intends to use to model SBLOCAs in AP1000. The confirmatory analyses should range hot leg entrainment consistent with ATLATS data and show that the uncertainty in modeling hot leg phase separation does not represent a significant safety issue in AP1000. Therefore, this is DSER Open Item 21.5-1.

Open Item Number: 21.5-2

Original RAI(s): 440.169

Summary of Issue: The applicant's submittals did not provide sufficient justification that the models and correlations in NOTRUMP or WCOBRA/TRAC have been adequately assessed to cover the ranges expected to occur in the upper plenum of the AP1000. While correlations exist to model upper plenum entrainment phenomena, the issue that remains is adequacy of the database. Existing correlations are based on relatively small diameter vessels, low gas flow rates, and for some data, air-water as opposed to steam-water. Because of the small vessel size in these data, conditions were essentially one-dimensional. Flow in the upper plenum of the AP1000 is expected to be non-uniform and three dimensional. Thus, a suitable database for assessing entrainment correlations in the upper plenum has not been established.

Given the lack of well scaled experimental data on upper plenum entrainment phenomena and the importance of predicting this process in an advanced plant SBLOCA transient, it is recommended that new experimental data be obtained to support the use of the upper plenum entrainment models in the AP1000. This data was requested by the NRC staff in a letter dated March 18, 2003, from J. Lyons. Therefore, this is DSER Open Item 21.5-2.

Open Item Number: 21.5-3

Original RAI(s): 440.164

Summary of Issue: At a meeting of the Advisory Committee on Reactor Safeguards (ACRS) Subcommittee on Thermal/Hydraulics on March 19 and 20, 2003, the subcommittee raised concerns on the high void fractions within the core calculated by NOTRUMP, WCOBRA/TRAC-AP, and RELAP5 during recovery from SBLOCA. The applicant responded that they had also predicted high void fractions in correlating test data. The subcommittee requested that the applicant provide additional justification that the AP1000 will remain covered as predicted by the codes by comparing the collapsed liquid levels predicted by the codes to those measured in tests. This is DSER Open Item 21.5-3.

AP 1000

cc:

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