52-003

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 12, 1996

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

SUBJECT: CONTAINMENT SYSTEMS AND SEVERE ACCIDENT BRANCH (SCSB) COMMENTS ON WESTINGHOUSE-PROPOSED SCHEDULE

Dear Mr. Liparulo:

The Nuclear Regulatory Commission (NRC) SCSB met with Westinghouse on October 25, 1996, to discuss its review areas for the AP600 advanced reactor design. Additionally, SCSB has reviewed the Westinghouse letter dated October 15, 1996, which outlined the current Westinghouse-proposed schedule. In response to this recent meeting and submittal, the following comments are provided.

General -

A meeting for each review area should be included in the schedule. This should be a reasonable amount of time following a key submittal or the final Westinghouse submittal.

Chapter 19 - Level 2/3 Probabilistic Risk Assessment (PRA)

Milestone 566: July 23, 1996 - Submit DOE Complementary Report (In-Vessel Steam Explosions)

This report states that it is technically supported by two verification reports, for the analytical tools utilized, ESPROSE.m and PM-Alpha. The staff does not consider this submittal complete without the companion documents which the staff has not received to date.

Milestone 565 (External Reactor Vessel Cooling (ERVC))/
Milestone 567 (Level 2/3 - Request for additional information (RAI) Completion)

- Both organizations agreed on a path to resolution on ERVC involving the reliance on ERVC complimented with limited deterministic analyses of exvessel phenomena.

- Staff review comments on the DOE report on ERVC were forwarded to Westinghouse in May 1996, but Westinghouse was unable to support discussions until late October 1996.

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- The telecon that was held on October 25, 1996, degenerated rapidly and was unproductive. As a result, Westinghouse is being requested to provide formal response to comments.

  The following items are not reflected in the Westinghouse schedule and can shift the completion date for review of ERVC and Level 2/3 PRA:

  1. The response to May 1996 comments/RAIs on ERVC.

  2. The assessment of the impact of fuel-coolant interactions (FCIs) during late reflood on ERVC (This was to be part of In-Vessel FCI report but missing).

  3. The resolution of issues related to the reactor pressure vessel (RPV) insulation system design impact on ERVC (These were identified in August 17, 1995, meeting, but no further actions have been taken).

Chapter 21 - Review of the WGOTHIC Computer Program

Milestone 739: July 1, 1996 - Scaling Report Revision

The original submittal was missing approximately 20 random pages. The report was resubmitted on August 8, 1996, with the missing pages. Westinghouse did provide the missing pages in advance of the formal re-submittal.

Staff has provided, via weekly telephone calls (July 22, July 25, August 1, August 9), comments on the revised scaling report. Three broad areas of concern were also identified. Westinghouse has provided some responses (faxed but not formal) on the comments. However, it is noted that some of the comments identified areas of omissions and errors and Westinghouse has only indicated that these would be corrected in a future submittal. The three broad areas of concern remain open as to what Westinghouse will provide in the scheduled final scaling report. However, the staff is concerned with the tentative position on two of these areas.

First, in an earlier version of the scaling work (WCAP-14190, October 1994), Westinghouse included an integration of the pressure change equations. The staff believes that integration of the scaling equations to obtain the pressure response for the design basis analysis (DBA) provides an essential confirmation of the reasonableness, completeness and accuracy of the scaling approach. While Westinghouse may have other convincing evidence to establish validity of the scaling methodology, there is a risk of delaying the review process should the staff determine that the scaling approach lacks such sufficient validation. In view of the new bounding approach being taken, the role of scaling in the AP600 design certification review remains unclear.

Second, the large-scale test (LST) data, an important component of the scaling approach, is essentially steady-state. One important aspect of the scaling analysis is the determination of the characteristic time rations for the various processes. In the final scaling report, Westinghouse should address how time dependent, i.e., rates for the various physical processes, is validated in the scaling analysis.

Milestone 740: January 31, 1996 - Noding Convergence Report (Draft)

This was rejected by the staff in a letter dated March 1, 1996. It has been re-submitted as Section 13 of WCAP-14407, "WGOTHIC Application to AP600." Only one of the major staff comments in the letter was incorporated - the mass and energy inputs were provided for the sensitivities. The staff will be issuing RAIs on Section 13 to obtain the information identified in the rejection letter as well as additional information determined to be necessary from the detailed review.

Milestone 741: July 1, 1996 - Mixing and Stratification Report (Draft)

The staff has discussed this early draft during a weekly call on August 9, 1996. Westinghouse has acknowledged receipt of comments through August 8, 1996, in the cover letter submitting WCAP-14407. A future revision of Section 9 is planned but no schedule has been provided. The review of Section 9 will be placed on hold until the revised writeup is submitted.

Milestone 742: May 21, 1996 - Water Coverage (Draft)

Water coverage was discussed during weekly calls in June and July. The submittal was based on the old 220 gpm flow rate. The flow rate was revised to 440 gpm. There was a meeting at Monroeville, June 5 and 6, 1996, to discuss this issue. Water coverage is Section 7 in WCAP-14407, and in its cover letter Westinghouse acknowledges that staff comments on previous versions are incorporated. However, comments on the use of the Zuber-Staub model provided by Westinghouse's consultant Dr. Bankoff, as noted during the June meeting, do not seem to appear in WCAP-14407. The staff believes Dr. Bankoff's comments clearly put in proper perspective the usefulness of Zuber-Staub for the issue of water coverage.

Milestone 743: November 30, 1996 - WGOTHIC RAI/open item (OI) Responses

There are still 45 of 139 RAIs issued through March 1996, unanswered - 26 of these date back to June of 1995. The April 1996, supplemental draft safety evaluation report (SDSER) OIs have yet to be responded to. Note also that recent responses to RAIs are based on documents that are under revision or known to contain errors. Additionally, there is no provision provided in the schedule to address possible RAIs on WCAP-14407, the scaling report, or the phenomena identification and ranking table (PIRT) report.

Milestone 744: September 10, 1996 - WGOTHIC Application Report

The submittal is not complete. In its cover letter, Westinghouse acknowledges that one section is missing and one is under revision to incorporate staff comments. No schedule for when these are to be submitted was provided. At the staff's last held weekly telephone call on September 24, 1996, it was left to Westinghouse to get back to the staff with the schedules for these as well as scaling, PIRT and final standard safety analysis report (SSAR) analyses, and a proposal for continued weekly calls.

The role of scaling, PIRT and the LST are not well documented in WCAP-14407. PIRT and scaling are only given a brief comment in Section 2. It is noted that these reports are not yet available for review. The role of the LST, other than as a separate effects test for mass and heat transfer correlations for the passive containment cooling system (PCS) performance, is not well documented.

Section 13, as noted under milestone 740, has not incorporated most of the comments provided in the staff's March 1996 rejection letter of the original submittal.

Sections 5 and 10 provided the results of sensitivity analyses but do not provide any information on the models used to perform the analyses. They do not even appear to use the same reference case. The model described in Section 4 includes features not previously identified or included in any of the nodal studied performed, nor in any of the reference calculations.

Milestone 745: December 16, 1996 - PIRT Report Revision

The reference report was submitted February 12, 1996, after being presented to the staff in a December 1995 meeting. The staff has provided feedback to Westinghouse on the referenced report structure, as well as other editorial and clarification issues, and Westinghouse is revising this report. In the reference report, Westinghouse used materials (for example, steel, concrete, PCS cooling water), structures (for example, shell, baffle, and baffle supports), and regions (for example, external atmosphere, in-containment refueling water storage tank (IRWST), and break pool) to evaluate the AP600. The revised report is now based on spacial regions, a more common approach. A preliminary version of the revised structure was provided to the Advisory Committee on Reactor Safeguards (ACRS) at the May 1996, meeting. The formal submittal is expected to include the staff's comments and be developed consistent with the format provided to the ACRS.

Milestone 746: January 6, 1997 - Scaling WCAP Revision (without steady state energy partitioning).

Milestone 747: February 15, 1997 - Scaling WCAP Revision addendum.

The staff has provided feedback as noted under milestone 739. It is not clear why two submittals are proposed. There remains uncertainty in the role and completeness of the scaling work as noted under milestone 739.

Milestone 748: February 15, 1997 - WCAP-14386 Revision.

The staff provided comments on the verification and validation report in the form of 12 RAIs in March 1996. No responses have yet been received.

Milestone 749: January 30, 1997 - WGOTHIC Application Report (WCAP-14407) Revision

This date is overly optimistic in that there still sections to be provided for staff review. The staff needs a schedule for the rewrite of Section 9 and for submittal of Section 12. Until the complete report is provided and the role of scaling, PIRT, and the LST are clarified, Section 14, "Summary," will be given a preliminary review for its content.

The staff is nearing completion of its acceptability review of WCAP-14407 (60 days after September 10, 1996, target is November 10, 1996) as provided. Pending acceptability, the staff will issue its RAIs no later than 60 addition days, target is January 10, 1997, on all but Sections 9, 12 and 14. At Westinghouse's request, RAIs will, for the most part, be issued by WCAP-14407 sections.

The remainder of the scheduled milestones are uncertain since portions of the material are yet to be provided.

Milestone 753: January 24, 1997 - Staff Completes Review

The staff can not complete its review prior to receiving new information (see for example milestone 747).

If you have any questions regarding this matter, you can contact me at (301) 415-8548.

Sincerely,
original signed by:
Diane T. Jackson, Project Manager
Standardization Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

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Mr. Nicholas J. Liparulo
Westinghouse Electric Corporation

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cc: Mr. B. A. McIntyre
Advanced Plant Safety & Licensing
Westinghouse Electric Corporation
Energy Systems Business Unit
P.O. Box 355
Pittsburgh, PA 15230

Mr. John C. Butler
Advanced Plant Safety & Licensing
Westinghouse Electric Corporation
Energy Systems Business Unit
Box 355
Pittsburgh, PA 15230

Mr. M. D. Beaumont
Nuclear and Advanced Technology Division
Westinghouse Electric Corporation
One Montrose Metro
11921 Rockville Pike
Suite 350
Rockville, MD 20852

Mr. Sterling Franks
U.S. Department of Energy
NE-50
19901 Germantown Road
Germantown, MD 20874

Mr. S. M. Modro
Nuclear Systems Analysis Technologies
Lockheed Idaho Technologies Company
Post Office Box 1625
Idaho Falls, ID 83415

Mr. Frank A. Ross
U.S. Department of Energy, NE-42
Office of LWR Safety and Technology
19901 Germantown Road
Germantown, MD 20874

Mr. Ronald Simard, Director
Advanced Reactor Programs
Nuclear Energy Institute
1776 Eye Street, N.W.
Suite 300
Washington, DC 20006-3706

Ms. Lynn Connor
Doc-Search Associates
Post Office Box 34
Cabin John, MD 20818

Mr. James E. Quinn, Projects Manager
LMR and SBWR Programs
GE Nuclear Energy
175 Curtner Avenue, M/C 165
San Jose, CA 95125

Mr. Robert H. Buchholz
GE Nuclear Energy
175 Curtner Avenue, MC-781
San Jose, CA 95125

Barton Z. Cowan, Esq.
Eckert Seamans Cherin & Mellott
600 Grant Street 42nd Floor
Pittsburgh, PA 15219

Mr. Ed Rodwell, Manager
PWR Design Certification
Electric Power Research Institute
3412 Hillview Avenue
Palo Alto, CA 94303

Mr. Charles Thompson, Nuclear Engineer
AP600 Certification
NE-50
19901 Germantown Road
Germantown, MD 20874

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