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

December 28, 1995

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

Dear Mr. Liparulo:

SUBJECT: FOLLOWON QUESTIONS ON THE AP600 WOBRA/TRAC LONG TERM COOLING ANALYSIS

As a result of its review of the June 1992 application for design certification of the AP600, the staff has determined that it needs additional information in order to complete its review. The enclosed questions were developed as a result of the WCOBRA/TRAC-Oregon State University Long Term Cooling Preliminary Validation Report. A preliminary version of these questions were discussed with Westinghouse during a meeting with the Nuclear Regulatory Commission staff on December 18, 1995.

You have requested that portions of the information submitted in the June 1992 application for design certification be exempt from mandatory public disclosure. While the staff has not completed its review of your request in accordance with the requirements of 10 CFR 2.790, that portion of the submitted information is being withheld from public disclosure pending the staff's final determination. The staff concludes that these followon questions do not contain those portions of the information for which exemption is sought. However, the staff will withhold this letter from public disclosure for 30 calendar days from the date of this letter to allow Westinghouse the opportunity to verify the staff's conclusions. If, after that time, you do not request that all or portions of the information in the enclosures be withheld from public disclosure in accordance with 10 CFR 2.790, this letter will be placed in the NRC's Public Document Room.

These followon questions affect nine or fewer respondents, and therefore is not subject to review by the Office of Management and Budget under P.L. 96-511.

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

Sincerely,

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

cc w/enclosure:
See next page

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

Sincerely,

Original signed by

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

cc w/enclosure:
See next page

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Mr. Nicholas J. Liparulo
Westinghouse Electric Corporation

Docket No. 52-003
AP600

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

Enclosure to be distributed to the following addressees after the result of the proprietary evaluation is received from Westinghouse:

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

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

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

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

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
U.S. Department of Energy
NE-451
Washington, DC 20585

STS, Inc.
Attn: Lynn Connor
Suite 610
3 Metro Center
Bethesda, MD 20814

Mr. John E. Leatherman, Manager
SBWR Design Certification
GE Nuclear Energy, M/C 781
San Jose, CA 95125

Mr. Sterling Franks
U.S. Department of Energy
NE-42
Washington, DC 20585

REQUEST FOR ADDITIONAL INFORMATION
CONCERNING THE AP600 WCOBRA/TRAC LONG TERM COOLING
PRELIMINARY VALIDATION REPORT (LTCT-GSR-003)

440.554 The containment is not part of the OSU simulation, the steam produced during the LTC was reintroduced as condensate into the IRWST. Containment condensation is a major part of the LTC cooling cycle. There is no discussion in LTCT-GSR-003 of the process which establishes the adequacy of the containment as a heat exchanger. In particular there is no discussion on: (1) the adequacy of the primary water to fill the containment with steam without core uncovery throughout the transient (2) the interface of the GOTHIC code and WCOBRA/TRAC regarding the time dependent condensation process and (3) the coolant inventory distribution as a function of time during the transient until steady state condensation rate is achieved.

440.555 The LTC window is supposed to represent a stable set of conditions demonstrating that the core remains covered and the system is able to dissipate the decay heat. Yet this does not seem to be the case in that there are still evolutions in the system parameters for the following figures: (1) the break flow integrals (Figures 5.5-4, 5.6-4, 5.7-4 and 5.8-5) (2) the ADS flow integrals (Figures 5.5-16, 5.6-16, 5.7-12 and 5.8-17) and the steam flow generated in the core (Figures 5.5-23, 5.6-23 and 5.7-19). In view of the above: why is the code converging?, why is the code stable? and why is the code suitable for the problem?

440.556 Section 15.6.5.4C.1.0 states that an entire transient was modeled. Please show the results of such a transient if it is available. If not why not?

440.557 On page 5.2-3 the presence of non condensable (air) caused a 500 sec delay to CMT draindown initiation. Is the presence of the accumulator cover gas accounted in the system during the transient?

440.558 The upper head water level in Figures 5.2-27, 5.3-30 and 5.4-28 for the last 3 simulations are missing. Why?

440.559 There is a significant discrepancy from 320 sec to 440 sec in the CMT injection flow rate Fig. 5.4-12. In addition the direction of the simulation is opposite to that of the calculation. The same trend is manifested in Figures 5.3-14, 5.2-12 and 5.1-8. What caused the discrepancy and what does it mean for the code?

440.560 What is the consequence of the systematic underprediction of the IRWST level in Figures 5.5-1, 5.6-1 and 5.7-1?

Enclosure

440.561 The WC/T ADS 1,2,3 flow integrals in Figures 5.5-16, 5.7-12 and 5.8-17 disagree with the OSU results and in addition show inconsistent trends. The trends do not point to a stabilized regime as expected for LTC. Please comment.

440.562 There is a large initial discrepancy (which persists throughout the window) in the core level estimates as shown in Figures 5.5-24, 5.6-24, 5.7-20 and 5.8-25. Please comment on this phenomenon and its significance.

440.563 The upper plenum pressure is underpredicted in Figures 5.6-2, 5.7-2 and 5.8-3. The corresponding break flows in Figures 5.6-4, 5.7-4 and 5.8-5 are inconsistent in that they should all be overpredictions. Aren't pressure predictions crucial for the core LTC behavior in that small pressure differences (from the real ones) can change the outcome of the transient? What are the step decreases in the beginning of these windows?

440.564 Figure 5.7-21 indicates the upper plenum level to increase while in this window the inventory should have stabilized. Please explain. In the remaining upper plenum data, there is a step level change. What is this due to?

440.565 In Figure 5.8-14 there is a significant DVI nozzle temperature underprediction, attributed to the contribution of the IRWST water. Is IRWST still operating this late in the transient?