June 27, 2002

Mr. W. E. Cummins, Director
AP600 & AP1000 Projects
Westinghouse Electric Company
Post Office Box 355
Pittsburgh, Pennsylvania 15230-0355

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 1 - AP1000 DESIGN CERTIFICATION REVIEW (TAC NO. MB4683)

Dear Mr. Cummins:

By letter dated March 28, 2002, Westinghouse Electric Company (Westinghouse) submitted its application for final design approval and standard design certification for the AP1000. Westinghouse supplemented the application by letters dated April 15 (6 letters), April 30 (5 letters), May 15, May 31, and June 18, 2002.

The Nuclear Regulatory Commission (NRC) staff is performing a detailed review of your design certification application to ensure that the information is sufficiently complete to enable the NRC staff to reach a final conclusion on all safety questions associated with the design before the certification is granted.

Review of the Westinghouse safety analyses and evaluation of AP1000 behavior, the automatic depressurization system-4 (ADS-4) blowdown, and liquid entrainment processes will require the staff to perform independent calculations. It is important that our licensing decisions be based on accurate and up-to-date information for the AP1000. As such, the NRC staff requires additional information to continue its review. The enclosed request for additional information (RAI) was sent to Mr. Michael Corletti of your staff via electronic mail on June 18, 2002, and discussed with your staff on June 19, 2002. It was agreed that you would provide your responses to these RAIs by July 12, 2002.

Also, your June 18, 2002, letter described your plan to submit a revision to WCAP-15833, "WCOBRA/TRAC AP1000, ADS-4/IRWST Phase Modeling," that will provide additional information addressing the validation of liquid entrainment models used in the NOTRUMP and WCOBRA/TRAC analysis codes by July 31, 2002. This issue was identified as an area in which the AP600 test data and analysis codes may not be applicable to the AP1000 design as discussed in our pre-application review assessment dated March 25, 2002. Timely receipt of high-quality information that satisfactorily addresses this issue is crucial to completing the review in a timely manner. Any delay in submission of this information will result in a corresponding delay in established milestone target dates.

If you have any questions or comments concerning this matter, you may contact me at (301) 415-3053 or ljb@nrc.gov.

Sincerely,

/RA/

Lawrence J. Burkhart, AP1000 Project Manager
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

Docket No. 52-006

Enclosure: As stated

cc: See next page

If you have any questions or comments concerning this matter, you may contact me at (301) 415-3053 or ljb@nrc.gov.

Sincerely,

/RA/

Lawrence J. Burkhart, AP1000 Project Manager
New Reactor Licensing Project Office
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Docket No. 52-006

Enclosure: As stated

cc w/encl: See next page

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OFFICE	NRLPO/PM	SRXB/BC	NRLPO/DD(A)
NAME	LBurkhart:cn	JWermiel	TBergman
DATE	6/26/02	6/26/02	6/27/02

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Request for Additional Information
Regarding AP1000 Design Certification

440.1 Provide a description of the revised reactor vessel internals surrounding the core, since in the AP1000 design the radial reflector has been eliminated and replaced by a core shroud. Please provide the following information for both the core and the core bypass flow paths:

a. the core bypass flow rate corresponding to thermal design flow at 10% steam generator tube plugging

b. the number of baffle plates, and baffle plate flow loss coefficients
c. the areas of the flow paths through the core bypass region:
d. dimensions, including the thickness and internal and external diameters of the core shroud, and core barrel, including the surface areas and metal masses
e. the core shroud material including the thermal conductivity, density and heat capacity.

Note: WCAP-15612, "AP1000 Plant Description and Analysis Report," page 2-22 listed the radial reflector design as "under review" by Westinghouse during Phase 2 of the review. Design parameters for the AP1000 have not been specified.

440.2 Provide the following dimensions and parameters related to the upper plenum:

a. the number, type (support column or guide tube), and dimensions of upper plenum structures, including the metal masses of these structures and the flow path dimensions through the guide tubes
b. the net free volume between the top of the upper core plate and the bottom of the upper support plate
c. the core barrel inner diameter in the upper plenum
d. the net free volume in the lower plenum (volume in the vessel below the bottom of the lower core support plate), and mass of the lower plenum metal structures
e. the number and dimensions of holes through the upper core plate sufficient to determine the flow area from the core to the upper plenum and from the core to the guide tubes

440.3 Provide the following information related to the core and fuel assemblies:

a. fuel assembly top nozzle flow area and loss coefficient
b. fuel assembly bottom nozzle flow area and loss coefficient
c. spacer grid loss coefficient

440.4 For the automatic depressurization system (ADS) please provide piping diagrams showing line sizes, lengths, and elevation changes for ADS piping from the top of the pressurizer to the in-containment refueling water storage tank (IRWST) for ADS-1, 2 and 3, and from the hot leg to the containment for ADS-4. Indicate the locations of valves.

440.5 Provide piping diagrams or equivalent information to show line sizes, lengths, elevation changes for the paths connecting the IRWST, core makeup tanks (CMTs), and accumulators to the vessel. Indicate the locations of the valves, and flow limiting devices in the accumulators or CMT discharge lines. For the flow limiting devices please provide values of areas and flow loss coefficients input into Westinghouse computer codes for analysis of a postulated direct vessel injection (DVI) line break for both probabilistic risk assessment (PRA) and design control document (DCD) analyses.

440.6 Provide piping diagrams or equivalent information to show line sizes, lengths, elevation changes for the paths connecting the primary reactor coolant system (RCS) with the passive residual heat removal (PRHR) system.

440.7 For the steam generator, provide secondary side flow areas, volumes, and locations of the wide and narrow range tap locations. Provide the flow area of the gap between the mid-deck plate and the upper shell wall. Provide the geometry/size of the main steam lines and their valves (opening times, delay times, loss coefficients).

440.8 For the AP1000 core, provide the neutron lifetime, doppler feedback curve of reactivity versus fuel temperature, and curve of moderator density versus moderator reactivity (covering the initial full power moderator density down to and including highly voided conditions).

AP 1000

cc:

Mr. W. Edward Cummins
Advanced Plant Safety & Licensing
Westinghouse Electric Company
P.O. Box 355
Pittsburgh, PA 15230-0355

Mr. Michael Corletti
Advanced Plant Safety & Licensing
Westinghouse Electric Company
P.O. Box 355
Pittsburgh, PA 15230-0355

Mr. H. A. Sepp
Westinghouse Electric Company
P.O. Box 355
Pittsburgh, PA 15230

Lynn Connor
Doc-Search Associates
2211 sw 1ST Ave - #1502
Portland, OR 97201

Barton Z. Cowan, Esq.
Eckert Seamans Cherin & Mellott, LLC
600 Grant Street 44th Floor
Pittsburgh, PA 15219

Mr. Ed Rodwell, Manager
Advanced Nuclear Plants' Systems
Electric Power Research Institute
3412 Hillview Avenue
Palo Alto, CA 94304-1395

Charles Brinkman, Director
Washington Operations
Westinghouse Electric Company
12300 Twinbrook Parkway, Suite 330
Rockville, MD 20852

Mr. R. Simard
Nuclear Energy Institute
1776 I Street NW
Suite 400
Washington, DC 20006

Mr. Thomas P. Miller
U.S. Department of Energy
Headquarters - Germantown
19901 Germantown Road
Germantown, MD 20874-1290

Mr. David Lochbaum
Nuclear Safety Engineer
Union of Concerned Scientists
1707 H Street NW, Suite 600
Washington, DC 20006-3919

Mr. Paul Gunter
Nuclear Information & Resource Service
1424 16th Street, NW., Suite 404
Washington, DC 20036

Ms. Wenonah Hauter
Public Citizen's Critical Mass Energy Project
215 Pennsylvania Avenue, SE
Washington, DC 20003

Mr. Tom Clements
6703 Guide Avenue
Takoma Park, MD 20912

Mr. James Riccio
Greenpeace
702 H Street, NW, Suite 300
Washington, DC 20001

Hugh Jackson, Policy Analyst
Public Citizen's Critical Mass Energy and Environment Program
1724 Duarte Drive
Henderson, NV 89014

Mr. William W. Ascroft-Hutton
St Peters House
Stanley Precinct
Balliol Road, Bootle
Merseyside UK L20 3LZ