April 24, 1997

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

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION (RAIs) RELATED TO THE APPLICATION OF WCOBRA/TRAC FOR LONG TERM COOLING (LTC) ANALYSES OF THE AP600

Dear Mr. Liparulo:

In support of the AP600 design certification review, the Nuclear Regulatory Commission (NRC) staff is evaluating the use of the WCOBRA/TRAC large break loss-of-coolant-accident analysis computer code for assessing the LTC performance of the AP600. Westinghouse letter NSD-NRC-96-4877, dated November 6, 1996, submitted the WCOBRA/TRAC OSU Long-Term Cooling Final Validation Report, WCAP-14776. The staff submitted RAIs on this report on March 4, 1997, and March 20, 1997. On March 28, 1997, Westinghouse met with the Advisory Committee for Reactor Safeguards (ACRS) thermal-hydraulic subcommittee to present the status of the WCOBRA/TRAC LTC methodology. Based on discussions during the ACRS meeting, the staff has several additional questions on the application of WCOBRA/TRAC LTC analysis to the AP600. The questions are provided as RAIs in an enclosure to this letter.

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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DOCUMENT NAME: A:WCT-LTC3.RAI *See previous concurrence

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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

Ms. Cindy L. Haag
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

AP600 REQUEST FOR ADDITIONAL INFORMATION

440.645 In the context of the application of the WC/T to the AP600, containment pressure is a boundary condition which impacts the windows solution of primary interest to the staff - reactor vessel water level. Westinghouse is requested to provide the following information concerning the use of the WC/T windows approach for AP600 calculations.

(a) How is the containment pressure coupled to the injection temperature?

(b) How are the Sump and IRWST level boundary (or initial) conditions determined for LTC?

(c) How is reactor vessel water level affected by the variations in containment pressure during and between windows?

(d) How is the OSU measured vessel level related to the AP600 calculated level at containment pressures higher than atmospheric?

(e) How is the time required to drain the IRWST determined? Since time determines the decay heat, how was this calculation qualified?

440.646 Containment pressure has not been a parameter in the OSU experiments. In addition, coupled WC/T and WGOTHIC solutions have not been submitted and containment pressure change scenarios have not been clearly investigated or discussed. Westinghouse needs to provide sufficient justification that the long term cooling solution is essentially stable considering fluctuations of containment pressure. Westinghouse should demonstrate that during long term cooling, upon initiation of core boiling, if containment pressure were to drop to atmospheric (or close to it), that the increased boiling would not create a high enough pressure in the vessel to prevent (temporarily) DVI flow or result in core uncovery and accelerate boiling, which could lead to a diverging core cooling solution. Westinghouse should also address what physical parameters would prevent this scenario and how is WC/T able to provide a reliable response to such a transient?

Enclosure