

June 16, 2003

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

SUBJECT: DRAFT SAFETY EVALUATION REPORT FOR THE AP1000 DESIGN

Dear Mr. Cummins,

On March 28, 2002, Westinghouse Electric Company (Westinghouse) tendered its application for final design approval for the AP1000 plant design in accordance with Appendix O to Part 52 of Title 10 of the *Code of Federal Regulations* (10 CFR), and for standard design certification in accordance with Subpart B of 10 CFR Part 52. Westinghouse supplemented its application on April 15, April 30, May 15, May 31, June 6, and June 18, 2002. The U.S. Nuclear Regulatory Commission (NRC) formally accepted the application as a docketed application for design certification on June 25, 2002. The staff has reviewed the design certification application and has developed the enclosed draft safety evaluation report (DSER).

The DSER is being issued in accordance with the review schedule identified in the enclosure to the staff's letter to Westinghouse dated July 12, 2002. Issuance of this DSER is an important milestone, but both Westinghouse and the NRC staff will have to remain focused on resolution of the identified open items in the period preceding preparation of the final safety evaluation report. The DSER contains more than 170 open items. Some of these open items are detailed, while others are more general in nature. The number of open items in a given review area or chapter may not be an accurate indicator of either the proximity to reaching a technical resolution, or the scope of the work remaining for Westinghouse and the staff to reach resolution.

Two broad open items resulted from partially incomplete reviews. Specifically, the review documented in Chapter 14, Section 14.2, reflects the staff assessment of the Initial Plant Test Program with the exception of certain aspects of the testing scope, general test methods, and acceptance criteria. In Section 3.3, and Chapter 21, the documented evaluation 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 for the AP600 design. Prior to issuing the final safety evaluation report for 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 design. In each of these cases, the NRC staff does not expect significant Westinghouse support in order to complete the reviews.

The staff is evaluating the appropriate analyses that Westinghouse should perform to resolve the leak-before-break issue discussed in Section 3.6.3.4, "Westinghouse Leak-Before-Break Evaluation Approach." The staff plans to issue a supplement to the DSER on this issue.

The following is a list of major issues that have an impact on completing the review:

- Liquid Entrainment

The staff's pre-application review assessment, dated March 25, 2002, identified a concern with the issue of liquid entrainment phenomena in the upper plenum during certain accident conditions. Following review of issues involving liquid entrainment from the automatic depressurization system - stage 4 (ADS-4) of the AP1000 design, such as might occur during the recovery from a small-break loss-of-coolant accident (SBLOCA), the staff requested, in a letter dated March 18, 2003, that you present new test data for the purpose of justifying the modeling of entrainment processes, including upper plenum entrainment. In addition to the new data, the staff requested that justifications for scaling of the test facility to the AP1000 design be provided, and that this new data be used to justify that the models within the computer codes used by Westinghouse to model liquid entrainment during SBLOCA for the AP1000 design basis are predicting the physical processes correctly. In your response dated April 11, 2003, you agreed to provide a scaling report, facility description report, and code applicability report (including test results) by July 2003.

- Security

The review of the AP1000 security plan is an open item in the DSER to allow the staff time to assess the security plan against recent NRC actions addressing security at nuclear power reactors. These include the issuance of Orders to power reactor licensees providing the interim compensatory measures for the high threat environment (power reactor ICMs) and the revised design basis threat for radiological sabotage for operating reactors (DBT). Westinghouse has recently been authorized, by the Commission, access to the power reactor ICMs and the DBT, and has submitted an assessment of the AP1000 design against those requirements. Revision 5 of the AP1000 design control document includes a revision that defers development of the security plan to the COL applicant. The staff plans to issue a supplemental DSER on the AP1000 security plan. The schedule for this review will be discussed in the context of the overall AP1000 design certification schedule at a future date.

The staff is committed to performing the AP1000 design review in as timely a manner as possible. To that end, it is imperative that Westinghouse and the NRC staff exchange complete, timely, and accurate information. Westinghouse's cooperation in setting up meetings, responding fully to the staff's needs for information, and docketing the needed information in a timely manner is an integral part of meeting the July 12, 2002, review schedule. Westinghouse should ensure that its meeting attendees have the authority to make commitments to resolve issues. Periodic senior management meetings will be used to address difficult issues, if necessary, but the staff's goal is to use this avenue for resolution judiciously.

You have requested that portions of the information submitted to support your application for design certification be exempt from mandatory public disclosure in accordance with the requirements of 10 CFR 2.790. The staff concludes that the enclosed DSER does not contain any information for which exemption has been sought or approved. However, the NRC will withhold the enclosed DSER from public disclosure for 14 calendar days from the date of this letter to allow Westinghouse the opportunity to verify the staff's conclusions. If, after that time,

W. E. Cummins

-3-

you do not request that all or portions of the DSER be withheld from public disclosure in accordance with 10 CFR 2.790, the enclosure will be made available for public inspection through the NRC's Public Document Room and the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

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, jps1@nrc.gov; Mr. Joseph Colaccino at (301) 415-2752, jxc1@nrc.gov; or Ms. Joelle Starefos at (301) 415-8488, 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

you do not request that all or portions of the DSER be withheld from public disclosure in accordance with 10 CFR 2.790, the enclosure will be made available for public inspection through the NRC's Public Document Room and the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

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, jps1@nrc.gov; Mr. Joseph Colaccino at (301) 415-2752, jxc1@nrc.gov; or Ms. Joelle Starefos at (301) 415-8488, 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

Distribution:

Hard Copy

PUBLIC	JSegala	RBarrett
NRLPO R/F	JColaccino	BBoger
JLyons	JStarefos	SBlack
JWilliams	OGC	DMatthews

E-Mail

SBajorek	AP1000 Reviewers
JFlack	AP1000 Managers
SRubin	
CAder	

ADAMS ACCESSION NUMBER: ML031640595

OFFICE	PM:NRLPO	LA:NRLPO	PM:NRLPO	PM:NRLPO
NAME	JStarefos:cn	LCox	JColaccino	JSegala
DATE	6/16/2003	6/16/2003	6/16/2003	6/16/2003

OFFICE	(A)DD:NRLPO	D:NRLPO	OGC	D:DE
NAME	JWilliams	JLyons	JMoore-w/comments	RBarrett
DATE	6/16/2003	6/16/2003	6/16/2003	6/16/2003

OFFICE	D:DIPM	D:DSSA	D:DRIP
NAME	BBoger-w/comments	SBlack	DMatthews
DATE	6/16/2003	6/16/2003	6/16/2003

Due to the volume of documentation associated with issuance of the AP1000 Draft Safety Evaluation Report (DSER), distribution of the enclosure to this letter will be made by electronic media (compact disk) following the 14-day proprietary review waiting period. If a hard copy is needed, please contact a member of the project management team identified in this letter.

AP 1000

cc:

Mr. W. Edward Cummins
AP600 and AP1000 Projects
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

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

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

Mr. James F. Mallay, Director
Regulatory Affairs
FRAMATOME, ANP
3315 Old Forest Road
Lynchburg, VA 24501

Mr. Ed Wallace, General Manager
Project Management
Lake Buena Vista Bldg., 3rd Floor
1267 Gordon Hood Avenue
Centurion 0046
Republic of South Africa
PO Box 9396 Centurion 0046

Mr. Vince Langman
Licensing Manager
Atomic Energy of Canada Limited
2251 Speakman Drive
Mississauga, Ontario
Canada L5K 1B2

Mr. Gary Wright, Manager
Office of Nuclear Facility Safety
Illinois Department of Nuclear Safety
1035 Outer Park Drive
Springfield, IL 62704

Dr. Gail H. Marcus
U.S. Department of Energy
Room 5A-143
1000 Independence Ave., SW
Washington, DC 20585

Mr. Edwin Lyman
Nuclear Control Institute
1000 Connecticut Avenue, NW
Suite 410
Washington, DC 20036

Mr. Jack W. Roe
SCIENTECH, INC.
910 Clopper Road
Gaithersburg, MD 20878

Patricia Campbell
Winston & Strawn
1400 L Street, NW
Washington, DC 20005

Mr. David Ritter
Research Associate on Nuclear Energy
Public Citizens Critical Mass Energy
and Environmental Program
215 Pennsylvania Avenue, SE
Washington, DC 20003

Mr. Michael M. Corletti
Passive Plant Projects & Development
AP600 & AP1000 Projects
Westinghouse Electric Company
P. O. Box 355
Pittsburgh, PA 15230-0355