

July 12, 2002

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

SUBJECT: AP1000 DESIGN CERTIFICATION REVIEW SCHEDULE (TAC NO. MB4682)

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.

Based on the information submitted on March 28, 2002, and the supplemental information provided through May 31, 2002, the NRC staff found that the application was sufficiently complete to be formally accepted as a docketed petition for design certification as described in the staff's letter dated June 25, 2002. The NRC staff is performing a detailed review of your design certification application to ensure that information is provided to enable the NRC staff to reach a conclusion on all safety questions associated with the design before the certification is granted. As such, the NRC staff is formulating requests for additional information (RAIs) regarding the information submitted to date. These RAIs are planned to be issued by September 30, 2002.

The NRC staff also reviewed the information for the purpose of formulating a complete design certification review schedule. Based on the information available to the staff including commitments made by Westinghouse regarding submission of supporting documentation, the design certification review schedule with milestones and associated target dates is included in the enclosure.

The enclosed schedule reflects a design certification review that is significantly shorter than the 5 to 6 years, and 7 to 8 years it took to complete the final design approvals and design certification rulemakings, respectively, for the ABWR, System 80+, and AP600. This is primarily due to the efficiencies that will be gained as a result of similarities between the AP600 and AP1000 designs. Despite these similarities, there may be several significant issues that will need to be resolved prior to issuance of the final design approval and completion of the design certification rulemaking. These issues include but may not be limited to the areas of liquid entrainment, fire protection, and safeguards and security requirements (as discussed below). Further complicating matters is the fact that, in at least two of these cases, the staff is waiting for Westinghouse to submit supplemental information to continue its review of these issues. Therefore, some amount of uncertainty exists with respect to assumptions regarding the resolution of these issues. Consequently, the enclosed schedule represents a current best-

estimate for resolution of all issues associated with the AP1000 design certification review given the staff's knowledge of the design and experience with previous design certifications. The staff plans to reevaluate the schedule at the draft safety evaluation report issuance stage to determine if the schedule can be modified. If high quality information is submitted by Westinghouse in its RAI responses, no other significant issues affecting the design certification review arise, and the resulting draft safety evaluation report contains minimal open items that can be expeditiously resolved, then the staff may be able to complete the final safety evaluation report in less time than that estimated in the enclosed schedule. However, if significant issues remain unresolved at the draft safety evaluation report stage, then the schedule will remain as stated. In any case the staff will continue to communicate with Westinghouse regarding any issue that may affect the schedule.

In the formulation of this schedule, the staff identified some areas of uncertainty that, depending upon the path of resolution, could challenge meeting the target dates. Some of these issues were identified during the pre-application review phase (as documented in our April 23, 2002, letter) and others became evident during the early stages of the design certification review. Following are discussions of these issues.

The NRC is currently assessing the need to revise its security requirements for operational and future nuclear plants. The NRC has already issued interim compensatory measures via Orders to enhance security at operational reactors. At this time, the NRC staff is reviewing the AP1000 design against the current safeguards and security requirements with consideration to including the design-related requirements of the interim compensatory measures for operational plants. The staff will attempt to forward RAIs in a timely manner and in accordance with the established schedule. However, the evolving nature of these issues may necessitate changes to target dates for the safeguards and security portions of the application. Communicating the details of the security requirements review with external stakeholders, including Westinghouse, is planned throughout this process.

Westinghouse and the NRC staff have identified areas in which additional information will be submitted to support the design certification review. Timely submission of the information cited in your letters dated May 15 and June 18, 2002, is integral to meeting the milestone target dates. Your May 15, 2002, letter described your plan to submit a revised fire risk assessment for the AP1000 design by July 31, 2002, and your June 18, 2002, letter described your plan to submit information addressing the validation of liquid entrainment models used in the NOTRUMP and WCOBRA/TRAC analysis codes by July 31, 2002. The former issue was previously documented in our letter dated April 23, 2002, and discussed with your staff at a meeting on May 1, 2002. The latter 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. At this time, these areas are considered critical paths to completion of the review due to the uncertainty of the content and quality of this information. Timely receipt of high-quality information that satisfactorily addresses both of these issues is crucial to completing the review in accordance with the enclosed schedule. Any delay in submission of this information will result in a corresponding delay in the established target dates.

With respect to the topic of timeliness of responses, an assumption of the schedule is that Westinghouse will respond in a timely manner to RAIs and draft safety evaluation report open items. Based on discussions with Mr. Michael Corletti, Westinghouse's Deputy Project

Manager for AP600 and AP1000 projects, Westinghouse intends to respond to RAIs and draft safety evaluation report open items within nine weeks of issuance. If additional time is necessary, please contact Mr. Lawrence J. Burkhart, the NRC AP1000 Project Manager, and the schedule will be revised accordingly.

The staff found during its pre-application review that there is a lack of sufficient test information supporting the understanding of the phenomenon of liquid entrainment in the hot leg and upper plenum during automatic depressurization system-4 (ADS-4) blowdown following a loss-of-coolant accident. Additional test data may be necessary contingent upon the outcome of the review of the supplemental information that will be submitted by July 31, 2002. At this time, the extent of additional testing, if any, that will be required to enable the staff to reach a conclusion on all safety questions associated with the liquid entrainment issue is unknown. If it is eventually decided that additional testing is needed, the schedule will be revised accordingly.

You submitted a letter dated February 13, 2002, in which you discussed your intentions regarding the use of design acceptance criteria (DAC) in the seismic, structural, and piping design areas. Your letter stated your intention to restrict the design to hard rock sites, to use DAC in the piping design areas, and to provide sufficient information to preclude the need for use of DAC in the seismic and structural areas. Furthermore, you stated that Westinghouse would perform structural calculations of certain critical sections of several structures and that the associated reports would not be available for NRC audit until the first quarter of Calendar Year 2003. The late availability of these reports may result in a delay of the resolution of any issues that arise from the staff's review of these reports and could impact the overall schedule if significant issues are found.

Another potential impact to the review schedule involves the development and implementation of the piping DAC. The staff assumes that Westinghouse will develop piping DAC in a manner similar to that used by General Electric and ABB-Combustion Engineering for the ABWR and System 80+, respectively. The established approach involves resolution of leak-before-break (LBB), flooding and sub-compartment pressurization, and thermal-hydraulic issues prior to issuance of the design certification. The piping DAC approach would also entail establishing a benchmark piping analysis problem for a representative AP1000 piping system and assessing, at a minimum, the piping issues that were addressed in Section 3.12 of NUREG-1512, "Final Safety Evaluation Report Related to Certification of the AP600 Standard Design." If the development of DAC for the AP1000 piping design deviates significantly from the established method, impacts on the review schedule may result.

With respect to LBB analyses, the staff is reviewing industry experience with primary stress corrosion cracking of Inconel materials and the corresponding bases for allowing the use of the LBB methodology for licensing activities. The staff is reviewing this issue generically and any potential impact on the AP1000 review is not yet known. The NRC staff plans to discuss this issue with Westinghouse representatives at a meeting scheduled for July 17, 2002.

W. E. Cummins

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The NRC staff plans to perform quality assurance (QA) design control implementation inspections as necessary, to determine if QA-related activities performed as part of the design of the AP1000 were conducted in conformance with the Westinghouse 10 CFR Part 50, Appendix B, QA program as described in the AP1000 design control document. The implementation inspection will cover applicable design and test activities and computer code validation. These inspections will be coordinated with Westinghouse to support the design certification review schedule.

The NRC staff will continue to assess issues that may affect the schedule of the AP1000 design certification review and will communicate these issues with Mr. Corletti. If you have any questions or comments concerning this matter, you may contact Mr. Burkhardt at (301) 415-3053 or ljb@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

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Sincerely,

/RA/

James E. Lyons, Director
 New Reactor Licensing Project Office
 Office of Nuclear Reactor Regulation

Docket No. 52-006

Enclosure: As stated

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<u>Distribution:</u>		<u>E-Mail</u>	GHolahan
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AP1000 DESIGN CERTIFICATION REVIEW
MILESTONES AND TARGET DATES

Milestone	Target Date	Time from completion of application (May 31, 2002)
NRC Issue Requests for Additional Information (RAIs)	September 30, 2002*	4 months
Westinghouse respond to RAIs	December 2, 2002 **	6 months
NRC Issue Draft SER with open items	June 16, 2003	12.5 months
NRC/Westinghouse meet with ACRS re: Draft SER	June/July	12.5 - 13.5 months
Westinghouse address open items	August 18, 2003**	14.5 months
NRC/Westinghouse meet with ACRS re: Final SER	July 2004	25 months
NRC Issue Final SER	September 13, 2004	27.5 months
NRC Issue Final Design Approval	October 25, 2004	29 months
Design Certification Rulemaking Complete	December 2005***	42 months

* RAI target date based on submission of supplemental material (fire risk assessment and information addressing liquid entrainment issue) by July 31, 2002.

** Response times based on verbal commitment made by Westinghouse representatives.

*** Date is dependent upon extent of any design changes necessitating NRC staff review, additional regulatory requirements, duration of hearings, etc.

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