



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

May 19, 1994

Docket No. 52-003

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

Dear Mr. Liparulo:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION ON THE AP600

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 additional information is needed in the area of equipment qualification (Q270.4-Q270.14).^{*} Enclosed are the staff's questions. Please respond to this request by June 30, 1994 to support the staff's review of the AP600 design.

In addition, Section 3.11.1.2 of the SSAR states that the methodology for environmental qualification of electrical equipment is based on the guidelines provided in IEEE Standard 323-1983. The staff has reviewed this version of the standard, and, to date, has not endorsed the proposed revision. Therefore, references to this standard in its entirety or in part are not acceptable. As indicated in a footnote to 10 CFR 50.49 and stated in NUREG-0588 and Regulatory Guide 1.89, the guidance in IEEE Standard 323-1974 is acceptable to the NRC staff for qualifying equipment within the scope of 10 CFR 50.49. This question was addressed in your November 30, 1992 response to Q270.2. However, the staff concludes that this response is not acceptable because the staff does not agree with the position that qualification to the 1983 revision of IEEE 323 is equivalent to qualification to the 1974 revision. Therefore, you should modify your response to Q270.2 accordingly. Q270.7 and Q270.9 also address this concern.

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 this request for additional information does 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,

^{*}The numbers in parentheses designate the tracking numbers assigned to the questions.

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Mr. Nicholas J. Liparulo

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May 19, 1994

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.

This request for additional information affects nine or fewer respondents, and therefore is not subject to review by the Office of Management and Budget under P.L. 96-511.

If you have any questions regarding this matter, you can contact me at (301) 504-1120.

Sincerely,

Original Signed By:

Thomas J. Kenyon, Project Manager
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Associate Director for Advanced Reactors
and License Renewal
Office of Nuclear Reactor Regulation

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

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REQUEST FOR ADDITIONAL INFORMATION
ON THE WESTINGHOUSE AP600 DESIGN

Environmental Qualification of Mechanical and Electrical Equipment

- 270.4 Section 3.11.1.1 of the SSAR states that a master list of safety-related electrical and mechanical equipment and a summary of electrical and mechanical equipment qualification results are maintained as part of the equipment qualification file. The SSAR should identify who will be responsible for establishing and maintaining these files.
- 270.5 Section 3.11.1.2 of the SSAR states that "Demonstration of qualified life by test and analysis (or both), with adequate justification, is provided by equipment suppliers, including the effects of aging when applicable." It is the NRC staff position that compliance with environmental qualification requirements is the responsibility the COL applicant, not the equipment suppliers. The SSAR should be corrected to clearly state who is responsible for compliance with requirements.
- 270.6 Section 3D.4.3 of the SSAR states that "Equipment located in radiation-harsh zone experiences a total integrated dose (TID) of radiation in excess of 10^4 rads gamma (10^5 for integrated circuits [ICs] and microprocessors) during its installed life." The NRC staff position is that equipment located in a radiation-harsh zone experiences a total integrated dose of radiation in excess of 10^4 rads gamma (10^5 for electronic equipment) during its installed life. Electronic equipment includes integrated circuits and microprocessors. However, integrated circuits and microprocessors does not necessarily include all electronic equipment. Therefore, the SSAR should be updated to conform with this position.
- 270.7 In Section 3D.4.4 of the SSAR where clarifications to the IEEE Standard 323-1983 recommended test sequence are discussed, Item 2, "Performance Extremes Test," states "For equipment where seismic testing has previously been completed employing the recommended methods of IEEE 344-1987, seismic testing is not repeated. Testing of the equipment to demonstrate qualification at performance extremes is separately performed as permitted by IEEE 323-1983 Section 6.3.2(3)." This position is not consistent with Section 6.3.2(5) of IEEE Standard 323-1974. The staff finds this position unacceptable, because the staff has reviewed and approved the use of IEEE Standard 323-1974, but has not approved the use of IEEE Standard 323-1983. The SSAR should be modified to conform with the staff's position. The position discussed in Item 3 of Section 3D.4.4 of the SSAR, "Aging Simulation and Testing," is also unacceptable because it is not consistent with IEEE 323-1974. Address these concerns.
- 270.8 Section 3D.4.5.4 of the SSAR is titled "Qualified Life Extension." The NRC has not developed a final position on the extension of the life of a plant beyond 40 years. Therefore, there are no provisions

Enclosure

for approval or disapproval of this section as part of the design certification review. Consequently, the staff will not review this section as part of the design certification review. The staff recommends removal of this section from the AP600 design certification review.

- 270.9 Sections 3D.4.6, 3D.4.7 and 3D.4.8 of the SSAR include discussions on operability time, performance criterion, and margin, respectively. Although the SSAR states that these discussions are consistent with the staff positions on these issues, the staff has determined that these discussions are not consistent with staff practice as outlined in NUREG-0588 and Regulatory Guide 1.89. The staff believes that this is due, in part, to the reference to IEEE Standard 323-1983 rather than IEEE 323-1974 in the SSAR. In order to eliminate the differences between the SSAR and the staff's positions, use NUREG-0588 and Regulatory Guide 1.89 in conjunction with IEEE Standard 323-1974 with the understanding that, if the IEEE Standard differs from the NUREG and the Regulatory Guide, then the guidance of the NUREG and Regulatory Guide should be followed. Note that the staff position is that operability time, performance criterion, and margin should be based on the AP600 accident analysis. The SSAR should be updated to conform with the staff's position on these issues.
- 270.10 Similarity is discussed in Section 3.D.10.2 of the SSAR. It is not clear that this discussion is consistent with staff practice on similarity. One of the most important aspects of the staff's position on this issue is that it is unlikely that similarity can be adequately demonstrated between equipment from different manufacturers. This section of the SSAR should address the staff's practice on this issue.
- 270.11 Section 3D.5 of the SSAR states that "normal conditions are those sets and ranges of plant conditions that are expected to occur regularly and for which plant equipment is expected to perform its safety-related function, as required, on a continuous, steady-state basis. Abnormal refers to the operating range in which the equipment is designed to operate for a period of time without any special calibration or maintenance effort. Design basis event conditions refers to environmental parameters to which the equipment may be subjected without impairment of its defined operating characteristics for those conditions." The descriptions of the three conditions are in terms of expected equipment performance rather than reactor operating conditions; consequently, the descriptions provide no information on the expected environmental conditions anticipated under each of the three conditions. The SSAR should discuss the anticipated environmental conditions associated with normal, abnormal, and design basis event conditions.
- 270.12 In Section 3D.5.5.1.1 of the SSAR, "Radiation Environment - Loss of Coolant Accident," there is no specific identification of what accident source term is being used in the AP600 accident analysis. For example, is the AP600 using the TID 14844 source term, the draft

NUREG-1465 source term, the EPRI source term, or something entirely different from these three? The SSAR should clearly and specifically identify the source term used in the AP600 accident analysis.

- 270.13 In Paragraph D.4.1.1 of Attachment D to Appendix 3D of the SSAR, "External Ambient Temperature (Ta)," provide the rationale for the following two sets of conditions described in this paragraph:
- a. For equipment located in areas supplied by an air-conditioning system, a typical value assumed for (Ta) throughout the qualified life is 77°F (25°C). For air-conditioning systems, two excursions per year to 91°F (33.3°C), each lasting 72 hours, has a negligible additional effect.
 - b. For equipment located in areas supplied by a ventilation system, a typical value assumed (Ta) throughout the qualified life is 68°F (20°C). Two excursions per year to 122°F (50°C), each lasting 72 hours, has a negligible additional aging effect."
- 270.14 Sections 3.11.1.2 and 3.11.2.1 of the SSAR imply that qualification by analysis alone is not permitted for the AP600 design. Page 3D-1 of Appendix 3D to the SSAR implies qualification by analysis only is permitted. Section 3D.6.2 states that the AP600 equipment qualification program does not establish qualification on the basis of analyses alone. In the sample equipment qualification data package (EQDP) on page 3D-69, it is stated that the AP600 EQ program does permit qualification solely on the basis of analyses. However, in accordance with 10 CFR 50.49(f), paragraphs 2.1(2) and 22.1(4) of NUREG-0588, and previous NRC staff practice, qualification by analyses only is not acceptable. Environmental qualification of electrical equipment important to safety for the AP600 design should be in accordance with the requirements of 10 CFR 50.49. Clarify your position. This question was also addressed in the November 30, 1992 response to Q270.3. However, the updated SSAR that was intended to address this issue is inconsistent.