May 20, 2003

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

Dear Mr. Cummins:

As you are aware, the U. S. Nuclear Regulatory Commission (NRC) staff is preparing the draft safety evaluation report (DSER) for the AP1000 design certification application submitted by Westinghouse Electric Company on March 28, 2002. The staff expects to issue the DSER in June, 2003. As of this date, the staff has identified two potential open items for DSER Chapter 5, "Reactor Coolant System and Connected Systems," which are enclosed for your information. Please note that the staff's review of the application will continue during preparation of the DSER, which may result in changes to the potential open items identified in the enclosure, or the addition of other open items.

The two potential open items in the enclosure have the original request for additional information (RAI) number included for reference. If the staff cannot resolve the potential open items before the issuance of the DSER, these items will be issued as DSER open items and be tracked with a corresponding open item number.

Previously, Westinghouse committed to provide responses to all identified open items within 9 weeks after the issuance of the DSER. The staff will be prepared to review your responses to the open items and have conference calls and meetings with your staff, as appropriate, after the DSER is issued. If Westinghouse chooses to address some or all of these open items before the issuance of the DSER, the staff may not have sufficient time to evaluate every response to the potential open items that Westinghouse submits to the NRC and make changes to the DSER before the scheduled DSER issuance in June, 2003.

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

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*see previous concurrence

ADAMS ACCESSION NUMBER: ML031400880

| OFFICE | PM:NRLPO | DD:NRLPO | D:NRLPO |
|---|---|---|---|
| NAME | JColaccino* | MGamberoni (JW for)* | JLyons |
| DATE | 5/20/2003 | 5/20/2003 | 5/20/2003 |

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**Westinghouse AP1000**
**Draft Safety Evaluation Report**
**Potential Open Items**
**Chapter 5**
**Reactor Coolant System and Connected Systems**

Open Item Number: 5.2.3-1

Original RAI(s): 251.012

Summary of Issue: The staff reviewed DCD Tier 2 Section 5.2.3.1, "Materials Specifications," to determine the suitability of the RCPB materials for this application. The AP1000 design conforms with the guidance provided in RG 1.85, "Materials Code Case Acceptability ASME Section III Division 1," and appropriate provisions of the ASME Code.

The staff noted that the DCD states that the RCP pressure housing will be made from SA 351 or SA 352 CF3A material and that the RCP pressure boundary valve bodies may be castings of SA 351 CF3A. In addition, the DCD states that CASS will not exceed a ferrite content of 30 FN. Since CASS RCP pressure boundary components are subject to thermal embrittlement, the staff requested, in RAI 251.012, the applicant discuss the impact of this aging effect on the integrity of these components, how the thermal embrittlement mechanism has been considered in the design and material selection for the RCPB components, and the need to perform inspections to detect this aging effect. In its response, the applicant stated that, based on experience with casting materials, the selection of low carbon grade casting, i.e., CF3A, and control of the material specifications to below 20 FN, there should be no significant impact of thermal aging on the integrity of the components. The applicant responded further that the inspections to detect the effects of any thermal aging will be part of COL applicant's inservice inspection (ISI) program. The proposed DCD change in the response to RAI 251.012 discusses the COL action items regarding these inspections in DCD Tier 2 Section 5.2.6, "Combined License Information Items." The applicant also committed to revising the limit of the ferrite content of CASS to a maximum of 20 FN. This revised FN was provided in Revision 4 of DCD Tier 2 Section 5.2.3.1, "Materials Specifications." The staff reviewed Revision 4 to the DCD and, subject to the clarification discussed below, finds it acceptable since it conforms with the guidance in RG 1.31, "Control of Ferrite Content in Stainless Steel Weld Metal," and criteria acceptable to the staff in the May 19, 2000, letter from C. Grimes to D. Walters.

The applicant needs to clarify in the DCD that the method used to calculate the δ-ferrite is based on Hull's equivalent factors or a method

producing an equivalent level of accuracy; i.e., ± 6% deviation between the measured and calculated values, as discussed in the May 19, 2000, letter from C. Grimes to D. Walters. This is Open Item 5.2.3-1.

Open Item Number: 5.3.3-1

Original RAI(s): 251.018

Summary of Issue: The staff requested, in RAI 251.018, that the applicant demonstrate that the P-T limits are in accordance with Appendix G to 10 CFR Part 50. The applicant responded, that the AP1000 heatup and cooldown operating curves were generated using the most limiting adjusted reference temperature values and the NRC-approved methodology as documented in WCAP-14040-NP-A, "Methodology Used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," with staff approved exceptions.

One exception is that instead of using best estimate fluence values, the applicant is using fluence values that are calculated fluence values. The staff finds this acceptable because this is in compliance with RG 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence." The other exception is that the $K_{Ic}$ critical stress intensities are used in place of the $K_{Ia}$ critical stress intensities. This methodology is taken from staff approved ASME Code Case N-641. The staff found the applicant's responses acceptable because the AP1000 P-T limit curves were developed in accordance with 10 CFR Part 50, Appendix G, with the exception that the flange requirement is in accordance with WCAP 15315, "Reactor Vessel Closure Head/Vessel Flange Requirements Evaluation for Operating PWR and BWR Plants." Currently, the staff has not approved WCAP 15315. Any changes to the RV closure head requirements would be incorporated into Appendix G of 10 CFR Part 50. If a relaxation to 10 CFR Part 50, Appendix G is approved, this will allow the operating window to be wider. Since applicants using AP1000 are required to meet the requirements of 10 CFR Part 50, Appendix G, applicants using AP1000 must meet the closure head requirements of Appendix G of 10 CFR Part 50. However, the AP1000 DCD does not provide limitations (values of $RT_{NDT}$) for the closure flange region of the RV and head. The AP1000 design must include these limitations in order to satisfy Appendix G of 10 CFR Part 50. The applicant should provide these limitations that are consistent with the present TSs and 10 CFR Part 50, Appendix G, or provide closure flange limitations with new TSs that are consistent with 10 CFR Part 50, Appendix G. This is Open Item 5.3.3-1.

AP 1000

cc:

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