



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

September 22, 1995

APPLICANT: Westinghouse Electric Corporation  
PROJECT: AP600  
SUBJECT: SUMMARY OF TELEPHONE CONFERENCES TO DISCUSS AP600 DESIGN  
ISSUES FROM MATERIALS AND CHEMICAL ENGINEERING BRANCH

The subject telephone conferences were held on September 11 and 19, 1995, between representatives of Westinghouse Electric Corporation and the Nuclear Regulatory Commission (NRC) staff. The purpose of the meeting was to discuss several draft safety evaluation report (DSER) open items (OI) in Chapters 4, 5 and 6. On September 11, Don Lindgren represented Westinghouse and Goutam Bagchi, David Terao, Diane Jackson and Mel Cowgill (consultant) represented the NRC. On September 19, Don Lindgren represented Westinghouse and Diane Jackson and Mel Cowgill (consultant) represented the NRC. A discussion sheet was faxed to Westinghouse on September 6, 1995. Attachment 1 is the reviewer's discussion sheet that was faxed with additional fields that explains Westinghouse's response for each item and the date of response. Attachment 2 is a Westinghouse response to discussions on open item 5.4.2.1-3. This response was provided to the NRC by electronic mail on September 13 and by fax on September 14, 1995.

The status of the open items discussed in the telephone conferences are detailed below:

<u>OI No.</u>	<u>DSER OI No.</u>	<u>Status and Action detail</u>
869	4.5.1-13	Action W - Westinghouse will review EPRI specifications and 2SSAR MIL specification references.
900	5.2.4-1	Resolved
902	5.2.4-3	Resolved
921	5.3.2-7	Resolved
933	5.4.2.1-1	Action N - Westinghouse stated that AP600 water chemistry guidelines follow or are more restrictive than EPRI guidelines; NRC to review.
934	5.4.2.1-2	Action W - (No change in status detail - SSAR has not been updated yet)
935	5.4.2.1-3	Resolved
967	6.1.1-8	Resolved

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- 1030 6.6-5 Resolved - Westinghouse states that relief is not expected for baseline design certification. Westinghouse will delete "expected."
- 1032 6.6-7 Action W - Westinghouse should address in one SSAR section how the AP600 is designed to minimize the effects of erosion/corrosion (E/C) and state surveillance commitments to identify how degradation caused by E/C will be detected.
- 1033 6.6-8 Action W - See response to open item #1032. In addition, Westinghouse shall include in a COL action item the need for augmented inspections.
- 1034 6.6-9 Action W - Westinghouse should provide a COL action item stating that the E/C inspection requirements be in accordance with ASME code, Generic Letter 89-08, and/or other, NRC staff approved methods.

Original signed by  
 Diane T. Jackson, Project Manager  
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Docket No. 52-003

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Westinghouse Electric Corporation

Docket No. 52-003

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## Discussion of Open Items

### DSER Item #

#### 5.2.4 - Reactor Coolant Pressure Boundary (RCPB) Inservice Inspection (ISI) and Testing

- 5.2.4-1 "Westinghouse should revise the SSAR to commit to ASME Ultrasonic Examination (UT) standards in Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems."

W status: Closed - Revision 3 of the SSAR commits the design to this standard.

Comment: it's not readily apparent that specific reference to Appendix VIII has been included in the revised SSAR.

Response (9/11): SSAR commits (5.2.4.2) to designing to the Code and its mandatory appendices. Appendix VIII is one of the Mandatory Appendices of Section XI, 1989 Edition plus Addenda.

- 5.2.4-3 "Westinghouse should modify the SSAR to indicate that the AP600 design will provide for pre-service and inservice inspection (PSI and ISI) examinations to meet the requirements of Appendix VIII. In addition, Westinghouse should provide the means of accomplishing this commitment during the design phase."

W status: Closed - SSAR Rev. 3 describes the design for inspectability program.

Comment: The description of the design for inspectability program is of a very general nature. There is no specific reference to Appendix VIII in the revised SSAR.

Response (9/11): see response to 5.2.4-1.

#### 5.3.2 - Reactor Vessel Materials

- 5.3.2-7 "Westinghouse has not described the specimens in the surveillance capsule as requested in Q252.94. The SSAR should be modified to include this information.

W status: Closed - the RAI requests information on use of correlation material. This material was a common lot of SA-302 material included in capsules for a number of vessels. The AP600 does not use SA-302 in the vessel and will not include correlation material.

Comment: Action on this item is assigned to NRC. There is no requirement that states that such material should be included in the surveillance program so, essentially, it hinges on whether the NRC wants to see specimens of a standard reference heat of material in the surveillance program. W's comment that they do not use SA-302 in the vessel is irrelevant. There is available material from a standard heat of SA-533 Type B Class 1 steel, from the NRC-sponsored HSST program - this is the type of material specified for use in the AP600 vessel. More to the point, material from this standard heat is used to permit comparisons of the irradiation effects from different operating reactors. It would be particularly appropriate to obtain such information from the AP600 because of differences in design and design life from currently operating PWRs. If Westinghouse does not wish to include such material at this stage in the design life certification process, an alternative would be to make this a COL Action Item.

Response (9/11): none required.

#### 5.4.2 - Steam Generator

- 5.4.2.1-1 "The AP600 design should meet the requirements of EPRI NP-5960, "PWR Primary Water Chemistry Guidelines," Rev. 1, and EPRI NP-6239, "PWR Secondary Water Chemistry Guidelines," Rev. 2."

W status: Action W - discuss guidelines with NRC.

Comment:

Response (9/11): W guidelines are more restrictive than those in the EPRI report. NRC will review info in the SSAR and compare with EPRI recommendations.

- 5.4.2.2-2 "Westinghouse should revise the SSAR to include the assumed corrosion allowances for the steam generator shell and support plate materials."

W status: Resolved - Allowance for the shell is 0.050. The stainless steel support plates do not have a corrosion allowance. This information will be included in the SSAR.

Comment: When is this addition anticipated?

Response (9/11): W regretted the omission of the statement from the last revision of the SSAR and committed to put it in the next revision.

5.4.2.1-3 "Westinghouse should describe in the SSAR its procedures for removing and replacing steam generators."

W status: Action W - Discuss this with the NRC. Inclusion of procedure not appropriate for SSAR. The design features of the steam generator easing replacement is described.

Comment: Is this a safety issue? Description of design features that ease replacement is minimal - basically just two statements.

Response (9/11): W reasserted that their belief that procedures such as that requested did not belong in the SSAR. The procedures in question had not yet been developed and even after they had been, revisions would inevitably be required at later dates. NRC would agree that the details of such procedures are not required for the SSAR but there is a need to address the safety aspects associated with the replacements. Can the SGs be easily removed through the equipment hatch? can the equipment and structures sustain the additional loadings that might be imposed by the operations? For example, are the loading capacities of the crane and the floor sufficient or will they need to be increased? W will review these safety aspects associated with SG replacement.

Follow up (9/14): W faxed response addressing concerns; NRC satisfied; matter resolved.

#### 6.1.1 - ESF Structural Materials

6.1.1-8 "Westinghouse should confirm that the ESF materials are compatible with the reactor coolant as described in Subarticles NB-, NC- and ND-2160, as well as Subarticles NB-, NC- and ND-3120, of the ASME Code, as appropriate."

W status: Action W - Address the operating temperature of cast material in ESF materials.

Comment: What is the status of this item?

Response (9/11): Don could not recall the original context of the response, thought the only place that castings were used were in the valves and temperatures would never be above that of the reactor coolant. Thermal embrittlement was not thought to be a problem for the ESF components. W was requested to include a statement to this effect in the SSAR.

Discussion (9/19): NRC informed W that it had resolved concerns regarding thermal embrittlement and no further action was needed.

6.6 - ISI of Class 2 and 3 Components

6.6-5 "Westinghouse should revise the SSAR to reflect the position that relief of ISI would be granted to COL applicant only for inspection conducted under later Code and would not apply to PSI requirements of the design certification Code"

W status: Closed - Combined License information item is included in SSAR Rev. 3

Comment - information item supposedly added to cover this not apparent in Rev. 3

Response (9/11): Item is resolved. SSAR states that relief is not expected to be required for baseline design certification; W will delete the "expected" phrase.

6.6-7 "Westinghouse should add COL Action Item 6.6-2 to the SSAR"  
COL AI 6.6-2 - "The COL applicant is responsible for inspecting pipe wall thinning as a result of E/C."

W status (6.6-7): Closed - Combined License information item is included in SSAR Revision 3

(COL AI 6.6-2): Proposed - COL item is not needed because the design addresses pipe thinning by materials selection and layout.

Comment: Inconsistent status responses.

Note that Rev. 3 of the SSAR states (page 10.3-5) "Pipe wall thickness inspections are performed to monitor erosion rates." If the COL applicant does not have the responsibility for this, who does?

Re proposal: not acceptable. Materials selection and layout can be used to minimize the potential for erosion/corrosion damage. However, the SSAR does not indicate how this potential has been evaluated. There is, for example, no acknowledgement that the report EPRI NP-3944, "Erosion/Corrosion in Nuclear Plant Steam Piping: Causes and Inspection Guidelines," has been consulted.

Response (9/11): W will prepare an addition to the SSAR summarizing how they evaluated the potential for E/C in the AP600.

6.6-8 "Westinghouse should discuss in the SSAR its design approaches to reduce the potential for erosion or corrosion of steel piping, apply measures to ensure that inspection will be possible and meaningful, and provide provision for repair or replacement."

W status: Closed - This information is included in SSAR Revision 3.

Comment: Westinghouse should include a COL Action Item indicating that the potential deterioration of piping due to flow-assisted corrosion will be addressed by use of the EPRI-developed CHECMATE computer code. This code can be used to predict corrosion rates and calculate the time remaining before reaching a defined acceptable wall thickness. Thus it can be used to identify areas where design improvements may be required to ensure adequate margin for the extended piping performance demanded by the AP600 design and where augmented inservice inspection might be appropriate.

Response (9/11): see response to 6.6-7. In addition, W will prepare an addition to the SSAR addressing COL actions to address need for augmented inspections.

6.6-9 "Westinghouse should add COL Action Item 6.6-3 to the SSAR."  
COL AI 6.6-3 - "The COL applicant should submit PSI and ISI program plan for staff review and approval. The COL applicant should verify its PSI and ISI programs will incorporate the requirements of Appendices VII and VIII of ASME, Section XI, and Generic Letter 89-08, "Erosion/Corrosion-Induced Pipe Wall Thinning."

W status (6.6-7): Closed - Combined License information item is included in SSAR Revision 3

(COL AI 6.6-3): Closed - Combined License information item is included in SSAR Revision 3

Comment: Rev. 3 of the SSAR indicates (6.6.9.1) that the COL applicant will only prepare PSI and ISI programs. This Combined License Information Item should be expanded to indicate that the COL applicant verify the inclusion in the PSI and ISI programs of the requirements of Appendices VII and VIII of ASME, Section XI, and Generic Letter 89-08, "Erosion/Corrosion-Induced Pipe Wall Thinning."

Response (9/11): see response to 6.6-8. In addition, W will prepare an addition to the SSAR to address COL applicant verification of inclusion of E/C inspection requirements per Generic Letter or other acceptable document.



Additional Item for 9/19 Teleconference:

4.5.1 - Control Rod and Drive System Structural Materials

- 4.5.1-13 "Because of the past history of failures with Inconel X-750, the staff requests that Westinghouse submit a copy of the specification to be used for this material in the control rod drive mechanisms (CRDMs). The differences between Westinghouse's specifications and the recommendations in EPRI-NP-7032 should be identified and discussed."

W/NRC status: Staff will review Utility Requirements Document (URD) Rev. 5 and the information included in draft revision of the SSAR as discussed in phone call of 4/27/95.

Discussion (9/19): NRC pointed out that one of the MIL specs. quoted in the draft SSAR, MIL-N-24114, was not generally available and that they had not yet been able to obtain a copy of the other one, MIL-S-23192. W was asked if they could supply a copy of MIL-S-23192 so that NRC could confirm that it was in compliance with the recommendations in the EPRI URD. Alternatively, W could revise the draft SSAR to reference to the EPRI-recommended specification included in EPRI-NP-7032.

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Open item 5.4.2.1-3 Considerations for steam generator replacement.

In response to the question about the feasibility of steam generator replacement the following information is provided.

SSAR subsection 3.8.2.1.1 notes that the crane rail girder and polar crane bridge are sized for steam generator replacement.

The equipment hatch is sized to permit one piece removal of the steam generator as noted in 3.8.2.1.3.

The transport of a steam generator during a steam generator replacement is one of the loads considered for design of the containment internal structures and for the path through the annex building. The design for and evaluation of these loads is part of the first of a kind effort.

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