

October 21, 2003

MEMORANDUM TO: Laura A. Dudes, Section Chief  
New Reactors Section  
New, Research and Test Reactors Program  
Division of Regulatory Improvement Programs, NRR

FROM: Joseph Colaccino, Senior Project Manager /RA/  
New Reactors Section  
New, Research and Test Reactors Program  
Division of Regulatory Improvement Programs, NRR

SUBJECT: AUGUST 22, 2003, AP1000 TELEPHONE CONFERENCE CALL  
SUMMARY

On Friday, August 22, 2003, a telephone conference call was held with Westinghouse Electric Company (Westinghouse) representatives and Nuclear Regulatory Commission staff and contractors to discuss AP1000 draft safety evaluation report (DSER) open items in Chapters 2, 3, and 19 related to the structural and seismic design. The call participants are listed in Attachment 1. A summary of the status of each open item discussed during the conference call is included in Attachment 2.

During the conference call, the NRC staff and its consultants noted that confirmatory action 3.8.2.6-1 and confirmatory item 3.8.5.5-3 were discussed in the DSER but not included in the list of confirmatory items in Chapter 1.7 of the DSER (note that there is no difference between a confirmatory action and a confirmatory item). A summary of the confirmatory items discussed during the call is included in Attachment 3.

The NRC staff also noted that there were inconsistencies between the DCD and the Westinghouse response to NRC request for additional information (RAI) 220.007, Revision 1 to RAI 220.007 was submitted by Westinghouse in a letter dated May 21, 2003 (ADAMS Accession Number ML031430359). Westinghouse stated that they would revise the RAI response and address the inconsistencies noted in Revision 7 of the DCD.

The final resolution of several open items discussed during this conference call required the NRC staff and its consultants to audit certain AP1000 structural calculations. The open items associated with the audit are noted in Attachment 2. The NRC staff performed the audit at Westinghouse in Monroeville, PA, during the week of October 6, 2003. This audit was similar to the audits previously held in November of 2002 and April of 2003. The NRC staff plans to issue an audit summary discussing the status of the open items associated with the calculations reviewed during the audit.

Docket No. 52-006

Attachments: As stated

cc w/atts: See next page

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AUGUST 22, 2003  
TELEPHONE CONFERENCE CALL SUMMARY  
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J. Colaccino

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NRC Consultants

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J. Braverman, BNL  
C. Constantino, CJC Engineering Associates and staff

SUMMARY OF STRUCTURAL/ SEISMIC OPEN ITEMS  
AP1000 TELEPHONE CONFERENCE CALL  
AUGUST 22, 2003

Open Item (OI) 2.5.1-1

Westinghouse stated that they will revise the design control document (DCD) to address dynamic behavior during an earthquake.

OI 2.5.2-1

The NRC staff considers this item resolved.

OI 2.5.4-1

Westinghouse stated that they will address concerns related to the lateral passive pressure used in the design of the nuclear island in a revision to DCD Tier 2 Section 2.5.4.6.3.

OI 2.5.4-2

Westinghouse stated that they will revise the open item response to discuss the change in bearing capacity from 450,000 pounds per square foot (psf).

OI 2.5.4-3

The NRC staff stated that no additional information is needed from Westinghouse to address this open item.

OI 3.3.1-1

The NRC staff stated it appears that Westinghouse has deviated from the ASCE 7-98 Standard. Westinghouse stated that they will review this open item and may request another phone call to discuss the issue.

OI 3.3.1-2

The NRC staff stated that ASCE 7-98 provides total lateral wind load for the robust nuclear island structure. Therefore, the wind load distribution around the circumference may not be needed. Westinghouse stated that they will review this open item and may request another phone call to discuss this issue with the NRC staff.

OI 3.3.2-1

Westinghouse stated that the provision to use lower differential pressure is for the combined license (COL) applicant to consider. Only the shield building is vented such that the differential pressure is zero. Westinghouse will review this issue and may request another phone call.

OI 3.3.2-2

Westinghouse stated that they will revise the DCD to reference the 3 criteria discussed in the draft safety evaluation report.

OI 3.3.2-3

The NRC staff stated that there is no additional action required from Westinghouse to address this open item.

OI 3.7.1.5-1

This issue is related to OI 2.5.4-2. Westinghouse stated that they will revise the open item response and DCD to better define the allowable bearing capacity of the site. The NRC staff stated that they will review this open item in a future audit at Westinghouse.

(Subsequent to the discussion of this open item, Westinghouse stated that the bearing capacity would be changed from 85,000 psf to 120,000 psf. Justification for this change would be provided in a revised response to OI 2.5.4-2. Also see summary of OI 3.8.5.5-1)

OI 3.7.2.1-1

The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 3.7.2.3-1

The NRC summarized the four issues associated with the response to this open item: 1) effects of basemat uplift and reduced concrete shear wall stiffness were evaluated separately but not coupled together, 2) no consideration of slapping effect in analysis, 3) performed a comparison for design loads but frequency and response spectra not included, and 4) a justification for using a reduced shear wave velocity from 8000 to 5600 feet per second for a hard rock foundation was not provided in the open item response.

Westinghouse stated that the response to OI 3.7.2.3-1 was provided in its response OI 19A.2-8. Much of the information the NRC staff identified above is either included in this revised response or revisions to the DCD. The NRC staff requested that Westinghouse either revise the response to OI 3.7.2.3-1 or provide the staff with sufficient guidance to locate the specific information requested by the NRC staff.

The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 3.7.2.3-2

The staff informed Westinghouse that their latest response still did not address the NRC's concern regarding the vertical acceleration reduction at the top of the steel containment vessel. The staff will perform a more detailed review of this open item during the forthcoming audit.

OI 3.7.2.3-3

The issue identified in this open item is closely related to OI 3.7.2.3-1. Therefore, this open item is considered resolved pending the resolution of OI 3.7.2.3-1.

OI 3.7.2.9-1

The issue identified in this open item is closely related to OI 3.7.2.3-1. Therefore, this open item is considered resolved pending the resolution of OI 3.7.2.3-1.

OI 3.7.2.16-1

Westinghouse stated that they will address this open item in conjunction with OI 3.7.1.5-1.

OI 3.8.2.1-1

The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 3.8.2.2-2

Westinghouse stated that this information would be designated as Tier 2\* in Revision 7 to the DCD. The NRC staff stated that this open item is considered confirmatory.

OI 3.8.3.5-1

The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 3.8.3.5-2

The NRC staff noted that it appears certain load combinations in DCD Tier 2 Table 3.8.3-4 Revision 6 changed from Revision 3 and these load combinations appear to be inconsistent with the description in DCD Tier 2 Section 3.8.3.3.1. Westinghouse believes the assumptions are conservative and may need to revise DCD to address the apparent inconsistencies identified by the NRC staff. The NRC staff stated that they will review this open item in a future audit at Westinghouse.

During the discussion of this open item, Westinghouse also noted that Revision 3 of the DCD contained AP600 criteria and this was noted in footnotes throughout DCD Tier 2 Chapter 3. Westinghouse stated that the DCD has been updated to specify AP1000 criteria. The NRC staff stated that during the April 2003 audit, they were not aware that they were reviewing AP600 information.

OI 3.8.3.5-3

The issue identified in this open item is closely related to OI 3.8.4.2-1. Therefore, this open item is considered resolved pending the resolution of OI 3.8.4.2-1.

OI 3.8.4.2-1

Westinghouse stated that the only location in AP1000 that is exposed to high compressive stresses is the shield building and that Wall 7.3 frames into the shield building. This issue is discussed in the response to OI 3.8.3.5-3. The NRC staff stated that they will confirm this in a future audit.

OI 3.8.4.3-1

The NRC staff stated that Westinghouse did not provide adequate technical justification that cracking of concrete does not provide degradation of walls. Westinghouse stated that this information is summarized in DCD Tier 2 Section 3.8.3.4 and they may revise their open item response and the DCD to address this issue.

OI 3.8.4.5-1

The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 3.8.4.5-2

Westinghouse stated that they would revise their open item response to address that this analysis method does not apply when large compressive loads are present, verification that the compression steel does yield when the ultimate strength of the section is reached, limits on the percentage of steel reinforcement specified in the code are not exceeded, and that the analysis method is not used outside its valid range. The NRC staff stated that this issue would be reviewed in the forthcoming audit.

OI 3.8.5.1-1

The NRC staff stated that the open item response did not include a technical basis for acceptability. Westinghouse stated that they understand the NRC staff's concerns and may revise the DCD as necessary and may request a conference call to discuss this issue further. The NRC staff stated that this issue will be reviewed during a future audit.

Separate to the discussion of this open item, Westinghouse stated that they will change the bearing capacity from 85,000 psf to 120,000 psf because the soil springs were modeled incorrectly. This change will be included in Revision 7 of the DCD.

OI 3.8.5.4-1

Westinghouse stated that this issue was addressed in their response to OI 19A2-8 and will revise this open item response to reference OI 19A.2-8. The NRC staff stated that they will review this issue in a future audit.

OI 3.8.5.4-2

The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 3.8.5.4-3

The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 3.8.5.5-1

The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 14.3.2-3

The NRC staff stated the proposed changes to the DCD did not address the issues identified by the NRC staff. Westinghouse stated that they will change the DCD to classify the thickness of the lower containment shell as Tier 2\* information. Therefore, this open item remains confirmatory.

OI 19.2.6-1

The NRC staff considers this open item resolved.

OI 19.2.6-2

Westinghouse stated they will revise their open item response to state that they used Code Case N284 with a multiplier of 1.5.

OI 19.2.6-3

The NRC staff considers this open item resolved.

OI 19A.2-1

The NRC staff considers this open item resolved.

OI 19A.2-2

The NRC staff considers this open item resolved.

OI 19A.2-3

The NRC staff considers this open item resolved.

OI 19A.2-4

The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 19A.2-5

The NRC staff considers this open item confirmatory pending a review of the AP1000 probabilistic risk assessment.



OI 19A.2-6

The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 19A.2-7

The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 19A.2-8

Westinghouse will revise their open item response to include a description of the seismic model. Westinghouse will also reference OI 3.8.5.4-1 in their response. The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 19A.2-9

The NRC staff requested the quantitative technical basis for the HCLPF (high confidence in low probability of a failure) values for components other than valves. Westinghouse stated that they would revise their open item response to include piping. Westinghouse also stated that they will specifically address areas where there are problems. The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 19A.3-1

The NRC staff stated that they will review this open item in a future audit at Westinghouse.

OI 19A.3-2

The NRC staff stated they do not require any additional information to evaluate this open item.

OI 19A.3-3

Westinghouse stated that they would revise their open item response. The NRC staff considers this open item confirmatory and will review the revised response.

Summary of Structural Confirmatory Items  
Discussed During AP1000 Telephone Conference Call  
August 22, 2003

The NRC stated that the following confirmatory items are now considered resolved:

3.8.2.2-1	3.8.4.1-1
3.8.2.4-1	3.8.4.5-1
3.8.2.4-2	3.8.5.4-1
3.8.3.2-1	3.8.5.4-2
3.8.3.5-1	
3.8.3.5-2	

Westinghouse stated that the following confirmatory items will be addressed in Revision 7 of the AP1000 design control document:

3.7.2.1-2  
3.8.2.1-1

AP 1000

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