

October 30, 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: OCTOBER 6-9, 2003, AP1000 STRUCTURAL AND SEISMIC AUDIT  
CONDUCTED AT WESTINGHOUSE ELECTRIC COMPANY

During the period of October 6, 2003, through October 10, 2003, Nuclear Regulatory Commission (NRC) staff members (Thomas Cheng, Goutam Bagchi, and myself), along with NRC contractor personnel from Brookhaven National Laboratory and CJC Associates, performed an audit of certain AP1000 structural and seismic calculations at Westinghouse Electric Company (Westinghouse) in Monroeville, Pennsylvania. A summary of the status of each AP1000 draft safety evaluation report (DSER) open item associated with the audit is included in Attachment 1. In addition, a summary of the status of each AP1000 DSER confirmatory item associated with the audit is included in Attachment 2.

The audit agenda is included as Attachment 3. Please note that the NRC staff were able to complete the audit in four days. Attachments 4-7 include information provided by Westinghouse to the staff in support of the audit activities.

Docket No. 52-006

Attachments: 1) Open Item Summary  
2) Confirmatory Item Summary  
3) Audit Agenda (ADAMS Accession No. ML032950113)  
4) AP1000 List of Open Items and Associated AP1000 Calculations  
(ADAMS Accession No. ML032950121)  
5) AP1000 Containment Vessel Design Presentation (ADAMS Accession  
No. ML032950124)  
6) Preliminary Response to DSER Open Item 3.7.2.3-2 (ADAMS Accession  
No. ML032950129)  
7) Draft Revision 8 of AP1000 Design Control Document, Tier 2 Section 3.3  
and a related Preliminary Revised Response to DSER Open Item 3.8.4.3-  
1, Revision 1 (ADAMS Accession No. ML032950131)

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**ACCESSION NUMBER: ML032950116-Pkg.**

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|---------------|-------------------|-----------------|-----------------|-----------------|
| <b>OFFICE</b> | <b>RNRP/PM</b>    | <b>EMEB</b>     | <b>EMEB</b>     | <b>RNRP/SC</b>  |
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| <b>DATE</b>   | <b>10/23/03</b>   | <b>10/24/03</b> | <b>10/23/03</b> | <b>10/30/03</b> |

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SUMMARY OF AP1000 OPEN ITEMS  
DISCUSSED DURING STRUCTURAL/SEISMIC AUDIT  
OCTOBER 6-10, 2003

Open Item (OI) 2.5.1-1

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 8 of the Ap1000 design control document (DCD).

OI 2.5.4-1

The NRC staff stated that this open item is considered resolved.

OI 2.5.4-2

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 8 of the DCD.

OI 3.3.1-1

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 8 of the DCD.

OI 3.3.1-2

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 8 of the DCD.

OI 3.3.2-1

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 8 of the DCD.

OI 3.3.2-2

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 8 of the DCD.

OI 3.7.1.5-1

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 8 of the DCD.

OI 3.7.2.1-1

The NRC staff stated that this open item is considered resolved.

#### OI 3.7.2.3-1

The NRC staff reviewed the seismic analysis of the basemat uplift and slapping. The NRC staff concluded that the effect of uplifting and slapping is small for safe shutdown earthquake. The shear stiffness reduction to the seismic response was also discussed and Westinghouse agreed to revise the open item response. The NRC staff stated that this open item is considered confirmatory pending a review of the revised open item response.

#### OI 3.7.2.3-2

The NRC staff stated that this open item is considered confirmatory pending a review of the revised open item response.

#### OI 3.7.2.3-3

The NRC staff stated that this open item is considered confirmatory pending a review of the revised open item response.

#### OI 3.7.2.9-1

The NRC staff stated that this open item is considered confirmatory pending a review of the revised open item response.

#### OI 3.7.2.16-1

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 8 of the DCD.

#### OI 3.8.2.1-1

The NRC staff stated that this open item involving the containment design is considered open. Westinghouse is considering options to resolve this open item. Westinghouse will provide a revised response and will discuss further in a conference call.

#### OI 3.8.2.2-2

The NRC staff stated that this open item is considered resolved.

#### OI 3.8.3.5-1

The NRC staff stated that this open item is considered resolved.

#### OI 3.8.3.5-2

The NRC staff stated that this item remains open. The columns have not been evaluated in the Westinghouse reconciliation calculation. In addition, the DCD and design report need to reflect consistent design parameters. Westinghouse also needs to explain the interaction value for the design of the in-containment refueling water storage tank column calculation. Westinghouse will revise the open item response and DCD.

OI 3.8.3.5-3

The NRC staff stated that this open item is considered confirmatory pending a review of the revised open item response.

OI 3.8.4.2-1

The NRC staff stated that this item remains open. Westinghouse presented an approach to address the issue on boundary elements for structural walls outside containment. Westinghouse will provide a revision to the open item response.

OI 3.8.4.3-1

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 8 of the DCD.

OI 3.8.4.5-1

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 8 of the DCD.

OI 3.8.4.5-2

This item remains open. Westinghouse needs to revise the open item response to document the implementation of the corrected interaction guidance for axial and bending moments.

OI 3.8.5.1-1

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 8 of the DCD.

OI 3.8.5.4-1

The NRC staff stated that this open item is considered resolved for safe shutdown earthquake.

OI 3.8.5.4-2

The NRC staff stated that this open item is considered resolved.

OI 3.8.5.4-3

The NRC staff stated that this open item is considered resolved.

OI 3.8.5.5-1

The NRC staff stated that this open item is considered resolved.

OI 14.3.2-1

The NRC staff stated that this item remains open pending the resolution of OI 3.8.2.1-1

OI 14.3.2-2

The NRC staff stated that this open item is considered resolved.

OI 14.3.2-3

The NRC staff stated that this open item is considered resolved.

OI 14.3.2-13

The NRC staff stated that this item remains open pending resolution of OI 3.7.2.3-1.

OI 14.3.2-14

The NRC staff stated that this open item is considered resolved.

OI 19.2.6-2

The NRC staff stated that this open item is considered resolved.

OI 19A.2-4

The NRC staff stated that this open item is considered confirmatory pending a review of PRA Table 55-1 and DCD Chapter 19.

OI 19A.2-5

The NRC staff stated that this open item is considered confirmatory pending a review of the AP1000 PRA.

OI 19A.2-6

The NRC staff stated that this open item is considered resolved.

OI 19A.2-7

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 8 of the DCD.

OI 19A.2-8

The NRC staff stated that this item remains open. Westinghouse is considering options to resolve this open item.

OI 19A.2-9

The NRC staff stated that this open item is considered confirmatory pending a review of Revision 2 of the open item response.

OI 19A.3-1

The NRC staff stated that this open item is considered resolved

OI 19A.3-2

The NRC staff stated that this open item is considered resolved.

OI 19A.3-3

The NRC staff stated that this open item is considered resolved.

SUMMARY OF AP1000 CONFIRMATORY ITEMS  
DISCUSSED DURING STRUCTURAL/SEISMIC AUDIT  
OCTOBER 6-9, 2003

The NRC staff stated that the following draft safety evaluation report (DSER) confirmation items (CI) are now considered resolved.

CI 3.7.2.1-3  
CI 3.7.2.2-1  
CI 3.7.3.2-1  
CI 3.8.2.1-1  
CI 3.8.4.5-2

The NRC staff also noted that Confirmatory Action 3.8.2.6-1 and Confirmatory Item 3.8.5.5-3 were identified in Chapter 3 of the DSER but not listed in the Confirmatory Item Table included in Chapter 1.7 of the DSER. The staff stated that both items are also considered resolved.

Westinghouse noted that the issues associated with CI 3.7.2.1-2 will be addressed in Revision 8 to the AP1000 design control document.

AP 1000

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