June 10, 2008

MEMORANDUM TO: Brian Thomas, Chief
Structural Engineering Branch 1
Division of Engineering
Office of New Reactors

Eileen McKenna, Chief
AP1000 Projects Branch 2
Division of New Reactor Licensing
Office of New Reactors

FROM: Michael Miernicki, Project Manager ***/RA/***
AP1000 Projects Branch 2
Division of New Reactor Licensing
Office of New Reactors

SUBJECT: NRC ON-SITE TECHNICAL REVIEW OF THE AP1000 DCD REVISION 16 SEISMIC / SRUCTURAL DESIGN CHANGES

As part of its review of the Westinghouse AP1000 design certification amendment request, members of the U.S. Nuclear Regulatory Commission (NRC) staff performed an on-site technical review related to AP1000 seismic / structural design changes. The review was conducted at Westinghouse Electric Company (Westinghouse) headquarters in Monroeville, Pennsylvania, May 19–23, 2008. This was the fourth on site review conducted at Westinghouse's offices in support of the proposed seismic and structural design changes. The review team was comprised of personnel from the Division of Engineering and their contractors, accompanied by the Project Manager for Chapter 3 of the AP1000 DCA. The review team is listed in Enclosure 1.

This technical review involved a confirmatory audit of the analyses and calculations pertaining to some of the RAI responses received to date by the staff, and a review of unresolved Request for Additional Information RAIs related to Technical Reports (TRs) on: Extension of the Nuclear Island Analysis to Soil Sites, Containment Vessel Design of Penetrations, High Frequency Response of Structures, and Spent Fuel Storage Rack Structural and Seismic Analyses. The agenda for the review is provided in Enclosure 2. The names of Westinghouse and contractor personnel who participated in the review are listed in Enclosure 3.

Westinghouse provided copies of internal procedures, calculation notes, forms, and other documents in the course of the review. Items reviewed by members of the team are identified in Enclosure 4.

On Friday, May 23, the team conducted an exit meeting with Westinghouse. The staff's observations were discussed along with the summary of RAI closure results which are provided in Enclosure 4. Westinghouse provided the following schedule for upcoming TR revisions: TR-54 Rev. 2 (complete re-analysis for soil spectra) - 6/6/08, TR-44 Rev. 1 - 7/1/08, and TR-57 Rev. 2 - 6/6/08.

Enclosure:
1. NRC review team
2. On-site technical review agenda
3. Individuals interviewed
4. Documents reviewed and summary of RAI closure results

Enclosure 1

NRC Review Team

Name	Organization
Brian Thomas	NRC/NRO/DE/SEB1
Mike Miernicki	NRC/NRO/DNRL/NEW2
Pravin Patel	NRC/NRO/DE/SEB1
Bret Tegeler	NRC/NRO/DE/SEB1
Thomas Cheng	NRC/NRO/DSER/RGS1
Carl Costantino	CJC Assoc.
Rich Morante	BNL
Joe Braverman	BNL

Enclosure 2

On-Site Technical Review Agenda

Date	Description of Review Item	Participants
Mon 5/19 8 am to 9 am	Road map TR 3 Rev 2 (Extension NI Seismic analysis to soil sites) changes	Orientation by Westinghouse for NRC Staff
9 am to 5 pm	Review TR 3 RAIs working table	Westinghouse and NRC (Pravin Patel, Bret Tegeler, Tom Cheng, Rich Morante, Carl Costantino)
9am to 5pm	Review TRs 115 and 144 and RAI responses (SRP3.7.1) (High Frequency)	" "
Tue 5/20 8 am to 5 pm	Continuation of review of TR 3, TR 115, and TR 144	" "
Wed 5/21 8 am to 12 pm	Continuation review of TR115,TR 144, and TR 3	" "
8am to 5 pm	TR 54(Spent Fuel Storage Rack and Structural and Seismic analysis) RAI response review and Rev of TR	Westinghouse, Holtec and NRC(Joe Braverman and the Staff)
1 pm to 5 pm	TR 9 (Containment Vessel Design Adjacent to Large Penetrations) - RAI responses	Westinghouse, CBI and NRC (Rich Morante and the Staff)
Thur 5/22 8 am to 5 pm	TR 54(Spent Fuel Storage Rack and Structural and Seismic analysis)	Westinghouse, Holtec and NRC(Joe Braverman and the Staff)
1 pm to 5pm	TR 9 (Containment Vessel Design Adjacent to Large Penetrations	Westinghouse, CBI and NRC (Rich Morante and the Staff)
FRI 5/23 8am -11am	Continuation of TRs 3 and 54 reviews	Westinghouse and NRC Staff
FRI 5/23 11 am	Exit - Discussion with Westinghouse for all above reviews.	Westinghouse and NRC Staff

Enclosure 3

Westinghouse Staff and Contractors Interviewed

Ed Cummins
Don Lindgren
Rob Sisk
William LaPay
Lee Tunon-Sanjur
Rob Morrow
Narendra Prasad
Dali Li
John Iacovino
Igor Tatarintseu
Keith Coogler
Vince Beddick
Carlos Cantarero-Leal
Chuck Bullard (Holtec)
Alan Soler (Holtec)
Dale Swanson (CB&I)

Enclosure 4

Documents Reviewed and Summary of RAI Closure Results

1. APP-GW-S2R-010, (TR 3), Rev 2 – Extension of Nuclear Island Analysis to Soil Sites
2. APP-GW-GLR-005(TR 9), Rev. 1- Containment vessel design Adjacent to Large Penetrations
3. APP-GW-GLR-033(TR 54), Rev. 1, Spent Fuel Storage Rack Structural Analysis
4. APP-GW GLR-115, (TR 115), Rev. 0, Effect of High Frequency Seismic Content on SSCs
5. APPGW-GLN-144, (TR 144) , Rev.0, High Frequency Tier 1 Changes
6. APP- MV50-S2C-013, Rev. 1, Reconciliation of Containment Vessel Seismic Design for Soil Sites. (reviewed input and results only)
7. APP-MV50 S2C-012, Rev 2, Design of Containment Vessel Penetration Reinforcement.
8. APP-MV50-S2C-010, Rev. 0, #D model Analysis Of large Penetrations. (reviewed input and results only)
9. APP-MV50-S3R-003, Containment Design report, (reviewed input and results only)
10. Holtec Report (Calculation) No HI-2063523, Rev. 0, Spent Fuel Rack Structural/ Seismic Analysis for Westinghouse AP1000. (Reviewed input and results only).

Changes to the RAI closure status are listed below. If an RAI number is not listed its status remains unchanged as a result of this on- site technical review. RAI closure working tables with the detailed status of information associated with each RAI are maintained by the SEB1 Branch.

TR3	-01	resolved
	-03	resolved
	-10	unresolved-agree in principle (U-AIP)
	-14	U-AIP
	-15	U-AIP
	-16	Unresolved, Will be transferred to TR#9 RAI table. Currently, Place holder
	-17	U-AIP
	-19	U-AIP
	-20	resolved
	-21	parts b and c unresolved
	-22	unresolved
	-32	U-AIP
	-34	U-AIP
SRP3.7.1	-01	resolved

	-02	confirmatory
	-03	resolved
	-04	resolved
	-05	resolved
	-06	unresolved
	-07	U-AIP
	-08	unresolved
	-09	U-AIP
	-10	U-AIP
	-11	unresolved
	-12	resolved
SRP3.7.1	-13	resolved
	-14	confirmatory
TR-9	-01	U-AIP
	-02	resolved
	-03	unresolved
	-04	unresolved
	-05	U-AIP
	-06	U-AIP
	-07	resolved
	-08	U-AIP
TR-54	-02	unresolved
	-03	unresolved
	-05	resolved
	-06	resolved
	-08	resolved
	-09	resolved
	-10	resolved
	-11	resolved
	-14	unresolved

	-15	unresolved
	-16	unresolved
	-17	unresolved
	-18	resolved
	-21	resolved
	-23	resolved
	-25	unresolved
	-26	unresolved
	-27	resolved
	-29	unresolved
	-30	unresolved
TR-54	-32	unresolved
	-35	unresolved
	-36	unresolved
	-37	resolved
	-38	unresolved
	-39	resolved