Westinghouse

Westinghouse Electric Company
Nuclear Power Plants
P.O. Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, D.C. 20555

Direct tel: 412-374-6206
Direct fax: 412-374-5005
e-mail: sisk1rb@westinghouse.com

Your ref: Docket No. 52-006
Our ref: DCP/NRC2455

April 30, 2009

Subject: AP1000 Response to Request for Additional Information (SRP 3)

Westinghouse is submitting a response to the NRC request for additional information (RAI) on SRP Section 3. This RAI response is submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in this response is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification and the AP1000 Design Certification Amendment Application.

Enclosure 1 provides the response for the following RAI(s):

RAI-SRP-3.8.3-SEB1-05

Questions or requests for additional information related to the content and preparation of this response should be directed to Westinghouse. Please send copies of such questions or requests to the prospective applicants for combined licenses referencing the AP1000 Design Certification. A representative for each applicant is included on the cc: list of this letter.

Very truly yours,

Robert Sisk, Manager
Licensing and Customer Interface
Regulatory Affairs and Standardization

/Enclosure

1. Response to Request for Additional Information on SRP Section 3

D063
NRO

cc:	D. Jaffe	-	U.S. NRC	1E
	E. McKenna	-	U.S. NRC	1E
	B. Gleaves	-	U.S. NRC	1E
	C. Proctor	-	U.S. NRC	1E
	T. Spink	-	TVA	1E
	P. Hastings	-	Duke Power	1E
	R. Kitchen	-	Progress Energy	1E
	A. Monroe	-	SCANA	1E
	P. Jacobs	-	Florida Power & Light	1E
	C. Pierce	-	Southern Company	1E
	E. Schmiech	-	Westinghouse	1E
	G. Zinke	-	NuStart/Entergy	1E
	R. Grumbir	-	NuStart	1E
	D. Lindgren	-	Westinghouse	1E

ENCLOSURE 1

Response to Request for Additional Information on SRP Section 3

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP-3.8.3-SEB1-05
Revision: 0

Question:

DCD Section 3.8.3.5.8 describes the design summary of critical sections for the CIS. Westinghouse is requested to address the following items related to this revised section:

For DCD Section 3.8.3.5.8.1 – Structural Wall Modules

1. The last paragraph, was revised to eliminate some Tier 2* information and criteria (denoted by italicized text, square bracket, and a superscript *). Westinghouse is requested to provide the basis for removing this information. The information removed relates to DCD Rev. 16 Tables 3.8.3-3 through 3.8.3-6. These tables have been substantially revised from the prior DCD tables to remove significant design information. Westinghouse is requested to provide the same or comparable information that was provided in prior revisions of the DCD.

2. The last two sentences in the referenced paragraph are italicized but are outside the square bracket with a star. These sentences should be placed inside the square brackets.

3. The last sentence states "See Appendix 3H for more detailed discussion." Westinghouse should explain why a reference for more detailed information of structural wall modules inside containment is made to Appendix 3H which addresses auxiliary and shield building critical sections.

For DCD Section 3.8.3.5.8.2 – IRWST Steel Wall

4. Same issue discussed in item 3 above is also applicable to DCD Section 3.8.3.5.8.2.

For DCD Section 3.8.3.5.8.3 – Column Supporting Operating Floor

5. Same issues as items 1 and 3 above are also applicable to DCD 3.8.3.5.8.3

Updating of all analyses due to changes in seismic and other loads

6. Westinghouse is requested to explain whether the information presented for all structures in DCD Rev. 16, Sections 3.8.1 through 3.8.5, and associated appendices reflect the latest set of updated analyses for the revised seismic loads (e.g., extension of design to soil sites and resolution of RAIs related to seismic) and revision of other loads which might have been updated from the prior version of the DCD.

If your response to this request for additional information will reference Revision 17 to the AP1000 DCD, please provide an exact reference.

Westinghouse Response:

1. The removal of the subject information was identified and explained in APP-GW-GLR-045 (Reference 1). This report supports the removal of the design load summary tables in Design Control Document (DCD) Subsection 3.8.3 and 3.8.4 and the tables of member forces and moments in Appendix 3H. The last paragraph of DCD Section 3.8.3.5.8.1 in DCD Revision 15 referenced member forces tables in DCD Revision 15. The information removed from tables in the DCD represents the results of detailed calculations and analyses. These results change slightly during the design finalization due to changes related to constructability and construction sequence. Finalization of the design spectra can also result in minor changes in the as-designed results. The DCD changes between Revision 15 and Revision 16 also supported the change of the design spectra from a hard rock only case to design spectra acceptable for multiple rock and soil cases. Small changes in modeling and updates to software may also have a minor effect on the results. For these reasons, it is not practical to lock in these design and analysis results in the DCD.

   Subsection 3.8.3, 3.8.4, and Appendix 3H as shown in Revision 17 provide information on the requirements and criteria for design configuration, and concrete reinforcement. These requirements and criteria lock-in the design for NRC review and demonstrate that the requirements and criteria for the design conforms with review guidance or otherwise uses appropriate design and analysis methods. The level of detail represented by the design summary tables of forces and moments does not appear to be consistent with the guidance of Regulatory Guide 1.70 and Standard Review Plan Section 3.8.4. SRP Section 3.8.3 and 3.8.4 do not suggest that this detailed information should be included in the DCD. Attempting to lock in the design loads results over specifies the design. The design loads and related information removed in DCD Revision 16 included the amount of reinforcement provided and identified the fraction of the limit calculated. This overly restricted the changes to the design during design finalization.

   Based on the above information, Westinghouse does not believe it is necessary to return the information on member forces and moments and the specific amount of reinforcement provided removed in DCD Revision 16 to the DCD. Detailed results of the analyses of the critical structures and other structures are available for NRC audit and have been reviewed by NRC review staff. These detailed design calculations include the design summary Tables of Forces and Moments. One of the reasons that the specific results for the critical structures were included in the DCD through Revision 15 was because of the relatively limited amount of design information available for the NRC review staff to look at to make a judgment about the implementation of the design methods, requirements, and criteria in the structural design. The information now available for NRC review is much more complete and comprehensive. Finally, the sufficiency of the as-built structural design is subject to verification with reports required by the inspections, tests, analyses, and acceptance criteria

(ITAAC) in Tier 1 of the DCD. Tier 1 of the DCD includes dimensional requirements for structures in the AP1000 design including critical structures.

Based on the above information Westinghouse does not believe it is appropriate to return the information on member forces and moments, and the specific amount of reinforcement provided, to the DCD.

2. In DCD Revision 17, the last two sentences of the last paragraph of DCD Section 3.8.3.5.8.1 were corrected to be standard, non-italic text because the text only provides cross-references, not design information critical to the NRC approval.

3. The last sentence of the last paragraph of DCD Section 3.8.3.5.8.1 should have been "See Technical Report APP-GW-GLR-045 for more details."

   This correction will be incorporated in next DCD revision as shown below.

4. The last sentence of the last paragraph of DCD Section 3.8.3.5.8.2 should have been "See Technical Report APP GW GLR 045 for more details."
   The latest set of updated analyses for the revised seismic loads including the extension of design to soil sites (six soils cases) was included in DCD Revision 17. These analyses also reflected changes to methods and criteria that resulted from resolution of RAIs related to seismic design and analysis.

5. For the same reasons outlined in item 1 above Westinghouse does not believe it is necessary to return the information on member forces and moments and the specific amount of reinforcement provided removed in DCD Revision 16 to the DCD Section 3.8.3.5.8.3

   The last sentence of the last paragraph of DCD Section 3.8.3.5.8.2 should have been "See Technical Report APP-GW-GLR-045 for more details."

   This correction will be incorporated in next DCD revision as shown below.

6. The last sentence of the last paragraph of DCD Section 3.8.3.5.8.3 should have been "See Technical Report APP-GW-GLR-045 for more details."

   This correction will be incorporated in next DCD revision as shown below.

References:

1. APP-GW-GLR-045, "AP1000 Standard Combined License Technical Report, Nuclear Island, Evaluation of Critical Sections" Westinghouse Electric Company LLC.

Design Control Document (DCD) Revision:

Revise the final paragraph of Subsection 3.8.3.5.8.1 as follows:

> [*The three walls extend from the floor of the in-containment refueling water storage tank at elevation 103′0″ to the operating floor at elevation 135′3″. The south west wall is also a boundary of the refueling cavity and has stainless steel plate on both faces. The other walls have stainless steel on one face and carbon steel on the other.*]* Design summaries are given in Table 3.8.3-4, 3.8.3-5, and 3.8.3-6. See Technical Report APP-GW-GLR-045 (Reference 56) for more details.

Revise the final paragraph of Subsection 3.8.3.5.8.2 as follows:

> *The wall is evaluated as vertical and horizontal beams. The vertical beams comprise the T-section columns plus the effective width of the plate. The horizontal beams comprise the L-section angles plus the effective width of the plate. Table 3.8.3-7 shows the ratio of the design stresses to the allowable stresses. When thermal effects result in stresses above yield, the evaluation is in accordance with the supplemental criteria*]* as described in subsection 3.8.3.5.3.4. See Technical Report APP-GW-GLR-045 (Reference 56) for more details.

Revise the final paragraph of Subsection 3.8.3.5.8.3 as follows:

> *The load combinations limits in Table 3.8.4-1 are used to assess the adequacy of the column.]* See* Technical Report APP-GW-GLR-045 (Reference 56) for more details.

Add Item 56 to Subsection 3.8.7 References

56. APP-GW-GLR-045, "AP1000 Standard Combined License Technical Report, Nuclear Island, Evaluation of Critical Sections" Westinghouse Electric Company LLC.

PRA Revision:
None

Technical Report (TR) Revision:
None