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Your ref: Docket No. 52-006
Our ref: DCP_NRC_002882

May 19, 2010

Subject: AP1000 Response to Proposed Open Item (Chapter 3)

Westinghouse is submitting the following responses to the NRC open item (OI) on Chapter 3. These proposed open item responses are submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in these responses 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 proposed Open Item(s):

OI-SRP3.9.1-EMB1-07 R1

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,

A handwritten signature in black ink, appearing to read 'Robert Sisk'.

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

/Enclosure

1. Response to Proposed Open Item (Chapter 3)

cc:	D. Jaffe	- U.S. NRC	1E
	E. McKenna	- U.S. NRC	1E
	P. Clark	- 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

AP1000 Response to Proposed Open Item (Chapter 3)

AP1000 TECHNICAL REPORT REVIEW

Response to SER Open Item (OI)

OI Response Number: OI-SRP3.9.1-EMB1-07
Revision: 1

Question: (Revision 0)

WESTEMS program provided an option to eliminate peak/valley points during calculation. The staff noted that the computer output should not be modified after executing the program. The staff requested the applicant to provide the configuration control and limitations of the program for this option. This concern is identified as **Open Item OI-SRP3.9.1-EMB1-07**.

In its response to RAI-SRP3.9.1-EMB1-07, the applicant indicated that WESTEMS provides various tools and options for the user to select the appropriate peak and valley points for the fatigue evaluation. It noted that the use of the WESTEMS peak time selection tools and options, as well as the interactive peaks editor, does not involve user modification of the fatigue analysis results output files. The applicant also noted that these tools allow the user to modify parameters of the peak time selection process and/or ultimately the peak and valley times/stresses used in the final analysis. The modifications are saved as revised inputs to the interactive fatigue analysis or in a file for fatigue reanalysis. The applicant is requested to discuss how the interactive WESTEMS allowing the user to manually modify the peak and valley times/stresses without the configuration control and documentation changes record satisfies the quality assurance requirements in accordance with 10 CFR 50 Appendix B and ASME NQA-1. **This is related to OI-SRP3.9.1-EMB1-07.**

Additional Question: (Revision 1)

In the response of OI-SRP3.9.1-EMB1-07, Westinghouse stated that "The user does not modify peak and valley times/stresses without configuration control. All peak and valley selection is recorded in the final configured output files so that inputs and outputs can be verified according to the QA process."

It is noted that the interactive WESTEMS allowing the user to manually modify the peak and valley times/stresses. The echo printout of the stress peak/valley modifications does not provide technical basis to modify the stress result calculated by WESTEMS. The staff requests Westinghouse to explain how to control the user operation for the modification and provide the technical basis for stress modification. Since the modifications are saved as revised inputs to the interactive fatigue analysis or in a file for fatigue reanalysis, the technical justification for modification should be provided by the analyst in the print out or recorded in file. The staff notes that the inclusion of peaks editor may imply that WESTEMS cannot select peak/valley locations adequately. Therefore, the peaks editor is required to modify the WESTEMS peak/valley stress results. The staff requests Westinghouse to discuss why peak editor is required to modify the peak/valley stress calculated by WESTEMS.

References:

1. ADAMS "Chapter 3 SER," ML092150664.

AP1000 TECHNICAL REPORT REVIEW

Response to SER Open Item (OI)

Westinghouse Response:

Revision 1:

This open item response has been revised to respond to the follow-up request by the NRC to the Rev. 0 response.

The ability for the user to edit stress peak and valley times is provided because the total set of peaks and valleys selected by the automated algorithm in WESTEMS™ is somewhat dependent on the user definition of the transient inputs and because the algorithm is designed to be conservative in the selection process. If the user determines that the conservative set of peaks and valleys is acceptable for qualification, no further action is required. On the other hand, the user has the ability to perform a more detailed evaluation by removing conservatism with the editing process and to document the justification for the final set of peaks and valleys for analysis. The revised peaks and valleys may be used in another execution of the program using the new input file to produce the final analysis for documentation.

Guidelines for accomplishing this process and the required analysis documentation are provided in a separate draft document, "WESTEMS™ Peak Selection Guidelines," which has been made available for staff review at the Westinghouse Twinbrook Office. This instruction will be included in the analysis plan for the AP1000 piping analyses and will also be incorporated in the next revision of the WESTEMS™ User Manual.

Revision 0:

Although WESTEMS™ provides various tools and options™ for the user to select the appropriate peak and valley points for the fatigue evaluation, it is important to note that the use of the WESTEMS™ peak time selection tools and options, as well as the interactive peaks editor, does not involve user modification of the fatigue analysis results output files. These tools allow the user to modify parameters of the peak time selection process and/or ultimately the peak and valley times used in the final analysis. The modifications are saved as revised inputs to the interactive fatigue analysis or in a file for fatigue reanalysis. These user modifications are reflected in the echo of inputs in fatigue analysis results files and/or in an intermediate fatigue analysis input file that is saved for use in reanalysis. When the fatigue analysis is run or re-run in the program, a separate set of analysis output files is created with the configuration control information, the echo of inputs, including the peak and valley time and stress information, and the fatigue stress range and usage factor calculation outputs. These analysis results output files constitute the quality assurance (QA) record for the analysis and include the program configuration control information, an echo of all of the analysis inputs, including time histories, selected peak and valley times and stress quantities, and details of the stress range and usage

AP1000 TECHNICAL REPORT REVIEW

Response to SER Open Item (OI)

factor calculations. These analysis records, together with the program user's documentation, provide sufficient documentation for independent verification of the fatigue analysis inputs and results, as required by the Westinghouse QA process. No additional information is needed to satisfy the QA requirements.

Response to follow-up question:

The user does not modify peak and valley times/stresses without configuration control. All peak and valley selection is recorded in the final configured output files so that inputs and outputs can be verified according to the QA process.

Design Control Document (DCD) Revision:

None

PRA Revision:

None

Technical Report (TR) Revision:

None