May 15, 2007

Ms. Andrea Sterdis, Manager
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SUBJECT: WESTINGHOUSE AP1000 COMBINED LICENSE PRE-APPLICATION TECHNICAL REPORT 3 - REQUEST FOR ADDITIONAL INFORMATION (TAC NO. MD2358)

Dear Ms. Sterdis:

By letter dated June 14, 2006 (DCP/NRC1751), you submitted AP1000 Technical Report 3, "Extension of Nuclear Island Seismic Analyses to Soil Sites," which provided information and documentation on the seismic analyses that have been performed to extend applicability of the AP1000 to soil sites. The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the application and has determined that additional information is required. Our questions are provided in the Enclosure. We discussed these issues with your staff on April 20, 2007. Your staff indicated that you would attempt to provide your response within 30 days of the date of this letter.

Please contact me at (301) 415-2304, if you have any other questions on these issues.

Sincerely,

/RA/

Michael J. Miernicki, Project Manager
AP1000 Projects Branch 2
Division of New Reactor Licensing
Office of New Reactors

Project No. 740

Enclosure:
Request for Additional Information

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION

WESTINGHOUSE AP1000 DOCUMENT NO. APP-GW-S2R-010, REV 0

TECHNICAL REPORT 3 - EXTENSION OF NUCLEAR ISLAND SEISMIC ANALYSES

TO SOIL SITES

PROJECT NUMBER 740

TR3-34 In Table 4.2.4-1, Westinghouse summarized the type of structural models (including models of soil foundation), analysis methods, and computer codes used in the task to extend the NI seismic analysis to soil sites. In the table, Westinghouse stated that the 2D finite element lumped-mass stick model of the auxiliary and shield building was analyzed, using the SASSI code, by time history analysis method for the purpose of parametric studies to establish the bounding generic soil conditions.

However, during its review of the response to RAI's, the staff noted that 2D seismic analyses were apparently used for other purposes also (e.g., 2D ANSYS time history analyses, 2D SASSI analyses based on 3D model (although it is not clear whether a finite element or a stick model was used), and 2D ANSYS time history analysis based on stick model, etc.).

Westinghouse is requested to clarify the information provided in table 4.2.4-1, and update this table as needed, to identify all applications of 2D seismic analysis and how results were utilized.

TR3-35 Since Westinghouse is in the process of extending the AP1000 design certification, which assumes a hard rock foundation, to cover a full range of possible soil sites, DCD Tier 2 Section 3.7 is being revised. The site parameters in the geotechnical and seismic areas also need to be updated.

Westinghouse should submit the required revisions to DCD Tier 2 Section 2.5 and DCD Tier 1 (design description, ITAAC, figures, and site parameters) for staff review.

TR3-36 Following its review of the applicant's response to RAI-TR03-023, the staff determined that it needs to conduct a more in-depth evaluation of how the equivalent static seismic acceleration method was implemented to calculate internal forces and moments needed for detailed design. The staff requests the applicant to provide the following additional information:

a. The detailed step-by-step description of how the equivalent static accelerations applied to the NI05 model were derived from the multiple NI20 time history analyses.

b. For each soil condition case, a set of 3 tables corresponding to revised Tables 6.4-1 through 6.4-3, which were included in the response to RAI-TR03-023 for the fixed base case.

c. An additional set of 3 tables, corresponding to revised Tables 6.4-1 through 6.4-3, that compares the NI05 equivalent static acceleration results with the envelope of the NI20 equivalent static acceleration results, and with the envelope of the NI20 time history results.

d. A detailed explanation, including quantitative data as appropriate, why significant differences (>10% under-prediction) between the design-basis NI05 static analysis results and the envelope of the NI20 time history results are considered acceptable.

e. A discussion of the extent of significant differences at locations that are NOT presented in the tables, including an explanation of the basis for acceptability.

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