August 21, 2006

Ms. Andrea Sterdis, Manager
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SUBJECT: WESTINGHOUSE AP1000 COMBINED LICENSE (COL) PRE-APPLICATION TECHNICAL REPORT 36 - REQUEST FOR ADDITIONAL INFORMATION (TAC NO. MD2109)

Dear Ms. Sterdis:

By letter dated June 5, 2006 (DCP/NRC1749), you submitted AP1000 Technical Report 36, "AP1000 Pressurizer Design," which summarized the design changes for the AP1000 pressurizer. The NRC staff has reviewed the application, and has determined that additional information is required. Our questions are provided in the Enclosure. We are including the questions issued by letter dated July 20, 2006, to include the question numbering scheme developed during conversations with you. Questions TR36-1 thru TR36-4 should be responded to by August 25, 2006. Questions TR36-5 thru TR36-7 were discussed with your staff on August 2, 2006 and questions TR36-8 thru TR36-11 were discussed with your staff on August 9, 2006. Your staff indicated that you would attempt to provide your response to questions TR36-5 thru TR36-11 by September 22, 2006.

Please contact me at (301) 415-1313, if you have any other questions on these issues.

Sincerely,

/RA/

Steven D. Bloom, Senior Project Manager
AP1000/EPR Projects Branch
Division of New Reactor Licensing
Office of Nuclear Reactor Regulation

Project No. 740

Enclosure: Request for Additional Information

cc w/encl: See next page

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ADAMS ACCESSION NO.:

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DATE	08/21/06	08/21/06

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REQUEST FOR ADDITIONAL INFORMATION

WESTINGHOUSE AP1000 DOCUMENT NO. APP-GW-GLR-016, Rev 0

TECHNICAL REPORT 36 - AP1000 PRESSURIZER DESIGN

PROJECT NUMBER 740

TR36-1 Section 2.1 of APP-GW-GLR-016, Rev 0 states that the inside diameter (ID) of the pressurizer was increased from 90 inches to 100 inches. Discuss the impact of the change in diameter on pressurizer stresses and pressurizer structural integrity.

TR 36-2 Table 5.1-2 of APP-GW-GLR-016 indicates that the pressurizer height and (ID) have changed and the volume remained the same. Figure 5.4-5 shows the original pressurizer (ID) equal to 90 inches (to clad). Revised figure 5.4-5 shows the new pressurizer (ID) equal to 100 inches (to base metal). Table 5.1-2 shows that the pressurizer (ID) changes from 90 to 100 inches. Dimensions 90 and 100 inches do not have the same reference. Explain the discrepancy and report (ID) used to calculate pressurizer volumes.

TR36-3A What is the pressurizer nominal base metal wall thickness and clad thickness?

TR36-3.B Provide the ASME code calculation used to establish the required pressurizer minimum wall thickness.

TR36-4 Section 2.1 of APP-GW-GLR-016, Rev 0 states that the pressurizer spray capacity was incorrectly shown to be 500 gpm and it has been changed to its corrected value of 700 gpm. Indicate whether this change in spray capacity changes the design transients used to evaluate the pressurizer or the pressurizer spray line. Was the 700 gpm flow rate used in the inadvertent pressurizer spray transient?

TR36-5 Westinghouse proposed in the topical report (TR), APP-GW-GLR-016, its design changes for the AP1000 pressurizer. Specifically, Section 2.1 of the TR proposed that the inside diameter of the pressurizer was increased, and the pressurizer vessel height was decreased while the internal volume of the pressurizer was maintained unchanged. These proposed changes would increase the cross-section of the pressurizer, and decrease the vessel height and the value (in percent of span) of the initial water level in the pressurizer assumed in the DCD chapter 15 transients and accidents analysis. Section 2.2 proposed that the vertical angular position of 14-inch ADS was changed. It is not clear whether the change will affect the ADS effective flow rate used in the DCD Chapter 15 analysis.

Enclosure

Sections 2.4 and 2.10 proposed that the setpoints (in a percent of span) were changed for the following functions: (1) the reactor trip on high-3 pressurizer water level; (2) the PRHR actuation of high-3 pressurizer water level; (3) the CVCS isolation on high-2 pressurizer water level; and (4) the CVCS isolation on high-1 pressurizer water coincident wit the S signal. These setpoint changes were to reflect the changes in dimension of the pressurizer and placement of the upper level tap on the upper head, while the water volumes of the respective setpoints were kept unchanged. Section 2.6 proposed that the elevations of ADS Stage 1, 2 and 3 were reduced, and Section 2.9 proposed that the pressurizer heater length was reduced to reflect the pressurizer dimension changes.

As discussed above, the proposed changes involve the following design parameters:

(I) The cross-section area of the pressurizer, the pressurizer vessel height, and the analytical value of the initial water level (in a percent of span);
(II)The effective ADS flow rate;
(III)The setpoints (in a percent) of the pressurizer for 4 functions;
(IV)The elevations of ADS Stage 1, 2 and 3 valves; and
(V)The pressurizer heater length.

Please provide information to address the impact of the proposed pressurizer design changes identified above on the results of the transient and accident analysis in DCD Chapter 15. The information should include:

i) A table that lists the values used in the DCD Chapter 15 analysis and the values for the proposed design changes for the parameters listed in items (I) through (V); and

ii) A discussion that addresses the impact of the changes for each parameter of items (I) through (V) on the Chapter 15 analysis, and demonstrates that the effects are insignificantly small and the Chapter 15 analysis is bounding and remains valid. If it is determined that Chapter 15 analysis is invalid, provide an acceptable reanalysis to the NRC for review and approval.

RAI36-6 On page 31 of the COLA Technical Report 36, the location of the Pressurizer centerline from the steam generator wall is shown to be 113.5" on the East side and 83.0" on the West side. On page 32 (which is the revised dwg.) the same dimensions are shown as 9'-7.39" and 7'-5.33" respectively. The applicant is requested to explain this difference in the text as is done for all the other changes.

RAI36-7 The applicant is requested to identify any modeling changes that were made to incorporate the configuration changes to the pressurizer. A comparison of the resulting spectra to the original spectra at the different locations where the desired response was expected to be lowered by this modification should also be presented.

TR36-8 It appears from the proposed changes made to Table 3.3-1 (Definition of Wall Thicknesses for Nuclear Island Buildings and Annex Building) of the AP1000 Tier One DCD that the thickness of the concrete walls surrounding the redesigned pressurizer have not changed as a result of this proposed change in the pressurizer dimensions. Verify that the thickness of these walls is sufficient to ensure that the radiation zones outside of the pressurizer compartment will not increase as a result of any possible increase in the radiation levels from the pressurizer as a result of the proposed pressurizer dimension changes.

TR36-9 Describe what affects, if any, the increase in the diameter of the pressurizer will have on the radiation levels (during full power, 24 hours after shutdown, and post-accident) inside the pressurizer compartment. If radiation levels from the pressurizer will increase, describe any effects this may have on exposures to personnel working in the vicinity of the pressurizer and describe any changes (e.g., extra shielding, administrative controls) that will be made to counteract this increase in radiation levels resulting from this design change.

TR36-10 On the basis of this proposed pressurizer design change, Westinghouse has modified various plant layout drawings in Chapters 1, 3, 5, and 9 to reflect the dimension changes to the concrete walls surrounding the pressuizer. Similar changes should be made to the applicable layout drawings shown in Figures 12.3-1, 12.3-2, and 12.3-3 in Chapter 12. In addition, these revised radiation zone drawings should indicate the resulting projected radiation levels (during full power, 24 hours after shutdown, and post-accident) in the vicinity of the pressurizer as a result of the pressurizer dimension changes.

TR36-11 Section 2.1 (Pressurizer Vessel) of the submittal states that the inside diameter of the pressurizer will be increased from 90 to 100 inches while the inside dimensions of the concrete walls enclosing the pressurizer will remain unchanged. Section 2.3 (Pressurizer Manway) states that the pressurizer manway will be relocated from the spherical head of the pressurizer to the cylindrical portion of the pressurizer. Table 12.4-6 of the AP1000 DCD, Tier 2, states that the annual dose estimate for in-service inspection work associated with the pressurizer shell is 1.20 man-rem. Discuss what affect the decrease in work area surrounding the pressurizer (due to the increase in pressurizer diameter), coupled with the relocation of the pressurizer manway, will have on personnel accessibility inside the pressurizer compartment and on the estimated annual dose for pressurizer shell in-service inspection.

General Comment: To enhance the review of the proposed changes to the configuration the staff suggests that the revision block in the drawings be used to reference the appropriate section of the text where the change is discussed.

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