

PMSTPCOL PEmails

From: Tai, Tom
Sent: Monday, August 16, 2010 9:54 AM
To: Price, John E
Cc: STPCOL; Chappell, Coley; Mookhoek, William
Subject: STP - Draft RAI 4992&4993 for Ch 3.4.2
Attachments: RAI 4992 03.04.02-10.doc; RAI 4993 03.04.02-11.doc

John,

Attached for your information are draft RAI 4992 and 4993 for Chapter 3.4.2. These are supplements to RAI 03.04.02-8 and 03.04.02-9, respectively (eRAI 4058 and 4091).

We have a open public meeting on Wednesday to discuss RAI. I suggest we should take advantage of this coming Wednesday (8/18) to make sure the questions are understood. I plan to issue these two RAIs Wednesday.

Regards

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RAI 4992 03.04.02-10.doc		31226
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Request for Additional Information No. 4992 Revision 3

South Texas Project Units 3 and 4
South Texas Project Nuclear Operating Co
Docket No. 52-012 and 52-013
SRP Section: 03.04.02 - Analysis Procedures
Application Section: FSAR 3.4.2

QUESTIONS for Structural Engineering Branch 2 (ESBWR/ABWR Projects) (SEB2)

03.04.02-***

In its evaluation of Open Item 03.04.02-8, the staff noted that the applicant provided only a partial response to the questions regarding the design of SSC with interaction potential subject to flood and other severe environmental loading. The staff agrees with the following aspects of the applicant's response:

- (a) Hydrostatic and hydrodynamic design flood forces would be provided as answer to RAI 03.04.02-9;
- (b) Concrete structures would be designed according to ACI 349-97, Section 9.2.1, which provides load combinations including extreme environmental loads such as extreme floods, by substituting Wt (tornado loads) with Fa (flood loads) in load combination number 5; and
- (c) For non-Seismic Category I structures with potential for interaction, evidence of the analysis for flooding loads would be included in the structural analysis report

However, the applicant's response is incomplete. The staff requests that the applicant provide more complete design specification information against flood loads, including:

- (a) all materials used in design (not only concrete);
- (b) complete description of load combinations, load parameters and acceptance criteria;
- (c) safety factors for stability (sliding, overturning) and soil parameters; and
- (d) design procedures and ITAAC tables.

The staff needs this information to be able to conclude that SSC with interaction potential are designed and built to withstand the design basis flood without compromising the safety functions of the Seismic Category I SSCs.

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QUESTIONS for Structural Engineering Branch 2 (ESBWR/ABWR Projects) (SEB2)

03.04.02-***

With STP letter U7-C-STP_NRC-100165, dated July 12, 2010, Attachment 1, the applicant responded to **Open Item 03.04.02-9**, stating that:

“Waves generated based on the provisions of the reference given in Standard Review Plan (SRP) Section 3.4.2.11(3) are discussed in FSAR Section 2.4S.3.6, which refers to FSAR Section 2.4S.4.3.1, which concludes that the maximum flood level, including the maximum wave run-up, would be El. 34.4 ft MSL. Table 2.4S.4-8 presents the water levels due to dam break, wind set-up and wave run-up at STP 3 & 4 for the critical fetch. The dynamic load effects due to wave run-up splash of 0.4 ft above plant grade level would be negligible in comparison to out-of-plane design basis loads such as tornado wind pressure for seismic Category I structures. The methodology given by the Coastal Engineering Manual (CEM), Reference 2.4S.4-13, was adopted to estimate the wave height and wave run-up at STP 3 & 4 power block. The procedures outlined in the **CEM** use the wind speed, wind duration, water depth, and over-water fetch distance, and the run-up slope surface characteristics as input. Reference 2.4S.4-13 is the "Coastal Engineering Manual," U.S. Army Corps of Engineers, June 2006, which is a later version of the reference given in SRP Section 3.4.11 (3). As discussed in COLA Section 2.4S.4.2.2.4.3 and in response to RAI 03.04.02-1, the 44 pounds per square foot hydrodynamic drag force is due to velocity of the Main Cooling Reservoir breach flood flow.”

During its evaluation the staff noted that the applicant’s response refers to the wave action associated with the postulated river dam breaks located upstream of the Units 3 & 4-site. These events are calculated to result in a maximum flood elevation (including wave action) of 34.4ft MSL, thus only 0.40ft above nominal finished plant grade set at 34.0 ft MSL. The staff agrees that the resulting hydrodynamic and wave loads from those events are not significant. The governing flood event is however the assumed breach of the Main Cooling Reservoir which leads to a calculated flood elevation of 38.8ft MSL or nominal DBFL of 40.0ft MSL. As stated in its response, the fluid analysis has determined a flow velocity of 4.72 fps with an associated hydrodynamic surcharge fluid pressure of 44 psf. For DBFL above finished grade, SRP Section 3.4.2.11(3) requires consideration of wave load effects in the design of Seismic Category I SSC.

In its response the applicant has not evaluated the effect of water waves that may propagate on the water surface of the governing flood event. In its response to RAI 03.04.02-1 (RAI 3322 Question 13161), the applicant also referred to responses to four other RAIs (RAI 03.08.01-4, RAI 03.04.02-2, RAI 03.04.02-4, and RAI 03.04.02-5) for

the resolution of RAI 03.04.02-1. The applicant is therefore requested to evaluate the effect of water waves that may propagate on the water surface of the governing flood event, and to track the closure status of the above noted four RAIs. The staff needs this information in order to be able to conclude that the above defined DBF effects are adequately accounted for in the design of Seismic Category I SSC pursuant to SRP Section 3.4.2.II(3).