

August 19, 2010

Mr. Scott Head, Manager  
Regulatory Affairs  
STP Nuclear Operating Company  
P. O. Box 289  
Wadsworth, TX 77483

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 358 RELATED TO  
SRP SECTION 03.04.02 FOR THE SOUTH TEXAS PROJECT COMBINED  
LICENSE APPLICATION

Dear Mr. Head:

By letter dated September 20, 2007, STP Nuclear Operating Company (STP) submitted for approval a combined license application pursuant to 10 CFR Part 52. The U. S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application to enable the staff to reach a conclusion on the safety of the proposed application.

The NRC staff has identified that additional information is needed to continue portions of the review. The staff's request for additional information (RAI) is contained in the enclosure to this letter.

To support the review schedule, you are requested to respond within **30** days of the date of this letter. If changes are needed to the safety analysis report, the staff requests that the RAI response include the proposed wording changes.

S. Head

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If you have any questions or comments concerning this matter, I can be reached at 301-415-8484 or by e-mail at [Tom.Tai@nrc.gov](mailto:Tom.Tai@nrc.gov) or you may contact George Wunder at 301-415-1494 or [George.Wunder@nrc.gov](mailto:George.Wunder@nrc.gov).

Sincerely,

**/RA/**

Tom M. Tai, Senior Project Manager  
ABWR Projects Branch  
Division of New Reactor Licensing  
Office of New Reactors

Docket Nos. 52-012  
52-013

eRAI Tracking No. 4992 and 4993

Enclosure:  
Request for Additional Information

cc: William Mookhoek  
John Price  
Coley Chappell  
Loree Elton

S. Head

-2-

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NRO-002

OFFICE	SEB2/TR	SEB2/BC	NGE2/PM	NGE2/L-PM
NAME	DJeng	KHawkins	TTai	GWunder
DATE	8/10/10	8/11/10	8/19/10	8/16/10

**\*Approval captured electronically in the electronic RAI system.**

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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)

**03.04.02-10**

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) a complete description of load combinations, load parameters and acceptance criteria;
- (c) the safety factors for stability (sliding, overturning) and soil parameters; and
- (d) the 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.

## Request for Additional Information No. 4993 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)

#### 03.04.02-11

With STP letter U7-C-STP\_NRC-100165, dated July 12, 2010, Attachment 1, the applicant responded to **RAI 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.II(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).