Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

October 6, 2010
U7-C-STP-NRC-100224

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Revised Response to Request for Additional Information

Attached is a revised response to an NRC staff question included in Request for Additional Information (RAI) letter number 345 related to Combined License Application (COLA) Part 2, Tier 2, Section 3.4, Water Level (Flood) Design. This revised response provides consistency with previously submitted RAI responses. Attachment 1 provides the revised response to the RAI question listed below:

03.04.02-8

There are no commitments in this letter.

If you have any questions, please contact Scott Head at (361) 972-7136, or Bill Mookhoek at (361) 972-7274.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 10/6/10

Scott Head
Manager, Regulatory Affairs
South Texas Project Units 3 & 4

jep

Attachment: RAI 03.04.02-8, Revision 2

D091
NRO

STI 32762002

cc: w/o attachments and enclosure except*
(paper copy)

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RAI 03.04.02-8, Revision 2

QUESTION:

In its response to RAI 3.4.2-4 (RAI 3322, Question 13165), the applicant has confirmed that nonseismic category I SSC will be designed against collapse when exposed to a DBF. Since the acceptance criteria in SRP (3.7.2.II.8) and the ABWR DC FSER, NUREG 1503 (Section 3.7.2) allow for design against collapse of interacting SSC, the applicant should provide design procedures for SSC with interaction potential, to resist the site-specific external events including design basis floods. Such procedures should include the corresponding ITAAC, the load parameters, load combinations, design acceptance criteria and the safety margins against failure that are equivalent to that of seismic category I SSC. The staff needs this information to conclude that there will be no adverse II/I interactions associated with the design basis flood.

REVISED RESPONSE:

The original response to this RAI, submitted with STPNOC letter U7-C-STP-NRC-100141 (ML1016900150), dated June 15, 2010, referred to values for hydrodynamic and hydrostatic flood forces that were anticipated to be provided in STPNOC's response to RAI 03.04.02-9. However, since the subsequent response to RAI 03.04.02-9 did not include specific design values for hydrodynamic and hydrostatic flood loads, STPNOC submitted Revision 1 to the response to RAI 03.04.02-8 to explicitly include the flood loads (see letter U7-C-STP-NRC-100193 dated August 19, 2010). The hydrodynamic and hydrostatic flood loads used in the design of Seismic Category I structures were subsequently provided in STPNOC's response to RAI 03.04.02-11 (see letter U7-C-STP-NRC-100208 dated September 15, 2010). The following revised response references the response to RAI 03.04.02-11. This response completely supersedes the previous response. The revised portion of the response is marked with a revision bar.

As discussed in STPNOC's response to RAI 03.04.02-4 (STPNOC letter U7-C-STP-NRC-090161 dated October 7, 2009), non-safety-related Structures, Systems, and Components (SSCs) that are located such that they could collapse onto safety-related SSC will be designed for design basis flood loads. SSCs with potential for interaction with Seismic Category I structures are those non-Seismic Category I structures that are within one building height above grade of a Seismic Category I structure; for example, a non-Seismic Category I building that extends 50 feet above grade and is less than 50 feet away from a Seismic Category I building.

The response to RAI 03.04.02-11 provides hydrodynamic and hydrostatic flood forces used in the design of Seismic Category I structures. For simplicity, these flood forces will also be used for the analysis of non-Seismic Category I structures with interaction potential in lieu of the flood forces previously provided in response to RAI 03.04.02-4.

ACI 349-97, Section 9.2.1 provides for other extreme environmental loads such as extreme floods by substituting the extreme environmental load for W_t in Load Combination number 5. In the case of extreme flood loads, F_a is substituted for W_t, as shown below. Safety margin is satisfied by maintaining the required strength, U, considering this load combination:

$$U = D + F + L + H + T_o + R_o + F_a$$

Where: U = required strength to resist factored loads or related internal moments and forces

D = dead loads, or related internal moments and forces, including piping and equipment dead loads

F = loads due to weight and pressures of fluids with well-defined densities and controllable maximum heights, or related internal moments and forces

L = live loads, or related internal moments and forces

H = loads due to weight and pressure of soil, water in soil, or other materials, or related internal moments and forces

T_o = internal moments and forces caused by temperature distributions within the concrete structure occurring as a result of normal operating or shutdown conditions

R_o = piping and equipment reactions, or related internal moments and forces, which occur under normal operating and shutdown conditions, excluding dead load and earthquake reactions

F_a = extreme flood load (as described in response to RAI 03.04.02-11)

The acceptance criteria for the required strength, U, are given in ACI 349-97.

SRP 3.7.2.II.8 referenced in this RAI is specific to the analysis of the potential for interaction between non-Seismic Category I structures for seismic events and does not address flooding or other non-seismic events. Compliance with the acceptance criterion of SRP 3.7.2.II.8 is addressed by various ITAAC contained in Tier 1 of the certified design control document (e.g., Section 2.15.11, Turbine Building, Table 2.15.11). These ITAAC require a structural analysis report which concludes that under seismic loads corresponding to the safe-shutdown earthquake ground acceleration the as-built structure does not damage safety-related functions.

For non-Seismic Category I structures with potential for interaction with Seismic Category I structures during flooding events, evidence of the analysis for flooding loads will be included in the structural analysis report for the respective non-Seismic Category I building.

No COLA revision is required as a result of this RAI response.