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

April 27, 2010
U7-C-STP-NRC-100092

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
Response to Requests for Additional Information

Attached is the response to the NRC staff question in Request for Additional Information (RAI) letter number 326 related to Combined License Application (COLA) Part 2, Tier 2, Section 2.5S.4, "Stability of Subsurface Materials and Foundations." Attachment 1 provides the response to the RAI question listed below:

02.05.04-35

When a change to the COLA is indicated, it will be incorporated into the next routine revision of the COLA following NRC acceptance of the RAI response.

There are no commitments in this letter.

If you have any questions, please contact me 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 4/27/10

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

rhb

Attachment: RAI 02.05.04-35

D091
NRO

STI 32660880

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

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RAI 02.05.04-35:

QUESTION:

Supplemental Response 1 to RAI 2.5.4-29 did not provide the dynamic bearing capacity factor of safety for the RSW Tunnels and the Diesel Fuel Oil Storage Tanks. Please provide dynamic bearing capacity factor of safety for all Category I structures, or justify why sufficient margin exists for some structures such that performing these analyses is not necessary.

Relates to Open Item 2.5.4-29

RESPONSE:

The dynamic bearing capacity factors of safety for the RSW Piping Tunnels and the Diesel Generator Fuel Oil Storage Vaults (the Diesel Generator Fuel Oil Tanks are located inside these vaults) are shown in the revised COLA Table 2.5S.4-41C, which was originally submitted with the Supplemental Response 1 to RAI 2.5.4-29 in letter U7-C-STP-NRC-090228, dated December 30, 2009.

The COLA will be revised as a result of this response as shown on the following pages.

Section 2.5S.4.10.3 of COLA (last portion of section before 2.5S.4.10.4, Settlement) and Table 2.5S.4-41C will be revised as shown below:

2.5S.4.10.3 STP 3 & 4 Bearing Capacity Evaluation

The allowable bearing pressure due to seismic loads would be calculated from the allowable bearing pressure under equivalent static loads. For a transient (dynamic) loading condition applied to the foundation after it has adjusted to its applied static loading, the allowable bearing pressure is computed using the consolidated-undrained (CU) total stress shear strength parameters in the clay soils layers. The effective stress shear strength parameters are used in the sand soil layers.

The bearing capacity calculation for seismic loading utilizes the CU (total) strength parameters for the clay layers, the effective strength for the sand layers and the same bearing capacity equations as for static loading, and a reduced foundation width and length due to the eccentricity caused by the seismic loading. The equation for the reduced foundation width and length is:

$B' = B - 2e_x$, Equation 2.5S.4-24B
$L' = L - 2e_y$, where

B' = Reduced foundation width,
L' = Reduced foundation length,
e_x = eccentricity of load in direction parallel to B, and
e_y = eccentricity of load in direction parallel to L.

The criterion factor of safety (FOS) is 1.5 when dynamic or transient loading conditions such as seismic apply (Reference 2.5S.4-69). The calculated FOS values during dynamic or transient loading for the Reactor Buildings, Control Buildings, UHS/RSW Pump Houses, RSW Piping Tunnels, and Diesel Generator Fuel Oil Storage Vaults are shown on Table 2.5S.4-41C. FOS values for the Diesel Generator Fuel Oil Tunnels are not shown in this table; however, in comparison to the RSW Piping Tunnels and Diesel Generator Fuel Oil Storage Vaults, these structures are lightly loaded. Therefore, considering the large FOS values for the RSW Piping Tunnels and Diesel Generator Fuel Oil Storage Vaults, FOS values for the Diesel Generator Fuel Oil Tunnels are judged to be greater than the required value of 1.5.

Table 2.5S.4-41C Bearing Capacity of Foundations under Dynamic or Transient Loading

Structure	STP	Soil Strength Selection [1]	Factor of Safety (FOS) [2]
Reactor Building	3	Short Term	2.35
	4	Short Term	4.55
Control Building	3	Short Term	6.01
	4	Short Term	1.73
UHS/RSW Pump House	3	Short Term	5.89
	4	Short Term	7.94
RSW Piping Tunnels	3	Short Term	44.74
	4	Short Term	34.24
Diesel Generator Fuel Oil Storage Vaults	3	Short Term	68.06
	4	Short Term	90.22

[1] Short term – undrained condition
[2] See Section 2.5S.4.10.3 STP 3 & 4 Bearing Capacity Evaluation