May 19, 2008

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 52 RELATED TO THE SRP SECTION 02.05.04 FOR THE SOUTH TEXAS COMBINED LICENSE APPLICATION

Dear Mr. Gibson:

By letter dated September 20, 2007, STP Nuclear Operating Company (STPNOC) 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 45 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.

If you have any questions or comments concerning this matter, I can be reached at 301-415-1494 or by e-mail at George.Wunder@nrc.gov.

Sincerely,

/RA/

George F. Wunder, Senior Project Manager
ESBWR/ABWR Projects Branch 2
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-012
52-013

eRAI Tracking No. 214

Enclosure:
Request for Additional Information

cc: William Mookhoek

If you have any questions or comments concerning this matter, I can be reached at 301-415-1494 or by e-mail at George.Wunder@nrc.gov.

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Enclosure:
Request for Additional Information

cc: William Mookhoek

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YLi, NRO
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RidsNroDserRgs1
RidsNroDnrlNge2

ADAMS Accession No. ML081420331 NRO-002

OFFICE	DSER/RGS2	DSER/RGS1/BC	OGC	NGE1/L-PM
NAME	YLi	RKaras	JBiggins	GWunder
DATE	04/28/2008	05/14/2008	05/15/2008	05/19/2008

*Approval captured electronically in the electronic RAI system.

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Request for Additional Information
South Texas Project Units 3 and 4
South Texas Project Nuclear Operating Co.
Docket Nos. 52-012 and 52-013
SRP Section: 02.05.04 - Stability of Subsurface Materials and Foundations
Application Section: 2.5.4

QUESTIONS

02.05.04-1

Figure 2.5S.4-2, Power Block Plan STP COLA site, does not show borings located within the footprint of the STP 4 Radwaste building or the pump houses at the UHS Basin. The STP Unit 4 Radwaste building substructure and UHS structure are Category 1 safety related structures (see ABWR DCD Table 3.2-1). Soil profiles underlying specific structures may vary from site-wide soil properties, and soil data within the footprint of each Category 1 structure is specified by Regulatory Guide (RG) 1.132. Please provide static and dynamic soil data and the related stability analyses for the Radwaste Building and UHS structure, based on considerations of subsurface data obtained at those locations.

02.05.04-2

Section 2.5S.4.5 describes the excavation plan for the STP COLA site, but does not include stability analyses for the temporary deep excavations. The excavation slopes (1v:2h) for Units 1 and 2 are referenced, and you indicate that excavation slopes for Units 3 and 4 would have wider berms, making them effectively flatter (1v:2.25h). However, the temporary excavation is 35 feet deeper, and subsurface soil properties are not identical between Units 3 and 4 and Units 1 and 2. In addition, the retaining walls north of the control building and south of the reactor complicate stability considerations. Please provide the final excavation plan, slope stability analyses, retaining wall design, and excavation monitoring plan per RG 1.206.

02.05.04-3

Section 2.5S.4.6.2 indicates that shallow well points and deep wells will be used to draw the water table to 3 ft. below the slopes and bottom of the excavation. You also stated that a dewatering plan will be developed during detailed design. The depth of the excavation and complicated soil profile, coupled with the combination of slopes and vertical retention systems, will make dewatering a critical element in the overall safety of the foundations of the Category 1 structures. Please provide the dewatering plan and a dewatering monitoring plan for review.

02.05.04-4

Section 2.5S.4.5.4 describes the proposed settlement and heave monitoring that will occur during various stages of construction for selected major STP Units 3 and 4 structures, selected STP Units 1 and 2 major structures and selected lengths of the Main Cooling Reservoir (MCR) earth dike during STP Units 3 and 4 excavations and dewatering. You indicated that monitoring program specifications will be developed during the detailed design stage and were not included in the application. As potential settlements (total and differential) will be significant, and are difficult to predict, the settlement and heave monitoring plan will be critical to ensuring that overstressing of Category 1 structures and piping systems will not occur. Please submit your settlement and heave monitoring plan.

02.05.04-5

Tables 2.5S.4-34 and 2.5S.4-35 list points of potential liquefaction within layers determined by the SPT and CPT. Tier 1 of the DCD does not allow liquefaction to occur at the plant site. Please provide a graphic interpretation of the areal extent in plan and profile of the liquefiable zones based on SPT and CPT and justify the occurrence of liquefaction with respect to the DCD Tier 1 requirement.

02.05.04-6

Table 2.5S.4-16, as well as the graphic boring logs, reveals that layer M was not sampled with the SPT and N-values, and soil property data do not exist for layer M. The properties from layer K were adopted for layer M according to Table 2.5S.4-16. However, the shear wave velocity measured in layer M is less than the shear wave velocity measured in layer K. Provide additional justification for assuming N-values and soil properties for layer M based on N-values and soil properties for layer K in light of these differences in shear wave velocities between the two layers.

02.05.04-7

Figures 2.5S.4-29 and 2.5S.4-30 show over-consolidation ratios (OCR) derived from CPT test data at shallow depths (El. 30 to El. -70). The calculated OCR values vary significantly in the various clay layers, but show a general trend of decreasing average OCR with depth. Below El.-61 the OCR range varies from less than 1.0 to 3.0. You used an average OCR of 1.8 to represent this depth interval (Strata F and J). However, the CPT data indicates a trend of decreasing OCR below El. -60 ft, with some data points indicating OCR values of less than 1. Consolidation test data do not show this trend. Please reconcile the different results and justify the assumed OCR value of 1.8 given the observed CPT trend of decreasing OCR below El. -60.

02.05.04-8

Figure 2.5S.4-28 shows that the OCR computed from consolidation tests falls below 1.0 at or below El. -270 ft. The liquidity indices shown in Figure 2.5S.4-20 do not indicate near normally consolidated or under-consolidated layers below this depth. Please reconcile the difference in the interpretation of these data and explain how the consolidation data were used in computing settlements.

02.05.04-9

Section 2.5S.4.2.1.6 discusses Stratum F and the soil properties derived from field testing. Stratum F is predominately a clay soil with a high percentage of fines and plasticity. The overall USCS classification of the soil is CH and CL. You corrected the SPT N-values to account for overburden pressure, and also to estimate undrained shear strength. However, you developed SPT overburden pressure corrections from large scale tests on granular soils (not clay soils). Please justify correcting N-values for CH and CL soils for all clay strata where N-values were corrected for the effects of overburden, considering that when N-values are corrected for overburden pressures less than 1 tsf, the corrected N-value would become unconservative (such as Stratum D).

02.05.04-10

Section 2.5S.4.2.1.6 discusses the Stratum F shear strength derivation. You assumed an undrained shear strength of 3.4 ksf to represent the layer based on the results of CPT testing and confirmed by higher shear strength values obtained in Stratum F at Units 1 and 2. Using an uncorrected average SPT N-value of 22, the undrained shear strength for stratum F determined from equation 2.5S.4-2 is 2.75 ksf, which agrees very well with the average results obtained from unconfined and UU testing (2.7 ksf). Please clarify how CPT shear strength correlations are more credible than laboratory test measurements, since you derived the site-specific cone factor from the laboratory test results.

02.05.04-11

Section 2.5S.4.2.1.6 describes the determination of the drained strength parameters for Stratum F. Drained strength parameters from CIU bar tests were effective phi = 8 degrees and effective cohesion = 2.0 tsf. This appears reasonable for an overconsolidated soil that was not tested at pressures above the preconsolidation pressure. However, in lieu of using data derived from Stratum F, the test assumed an effective phi of 20 degrees determined from testing stratum D for the analyses. Please clarify what makes stratum D test data more representative than Stratum F test data.

02.05.04-12

According to the ABWR DCD (Chapter 2, “Site Characters”), the MINIMUM shear wave velocity requirement for subsurface soil is 305 m/sec (1,000 ft/sec). Based on Section 2.5.4, Figure 2.5 S. 4 - 39-44, shear wave velocities at multiple depths in the soil profiles are less than 1000 ft/sec below the foundation of seismic category 1 structures. Please discuss the shear wave velocities for the site with respect to the ABWR DCD Tier 1 criteria.