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. 49 RELATED TO THE SRP SECTION 02.05.01 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. 208

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.

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. 208

Enclosure:
Request for Additional Information

cc: William Mookhoek

Distribution:
PUBLIC
NGE 1/2 R/F
GWunder, NRO
YLi, NRO
JBiggins, OGC
RidsNroDserRgs1
RidsNroDnrlNge2

ADAMS Accession No. ML081410483 NRO-002

OFFICE	DSER:RGS1	DSER:RGS1:BC	OGC	NGE1/L-PM
NAME	YLi	RKaras	JBiggins	GWunder
DATE	04/24/2008	05/13/2008	05/13/2008	05/19/2008

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

OFFICIAL RECORD COPY

Requests 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: 02.05.01 - Basic Geologic and Seismic Information
Application Section: 2.5

QUESTIONS

02.05.01-1

Based on Blum and Aslan (SSAR Reference 2.5S.1-38) and dozens of papers during the past 15 years, the present concept of the "Beaumont Formation" in terms of both the origin and age of its sediments and the landforms associated with it is quite different than described in Section 2.5S.1.1.4.1.3. Please provide an up-to-date summary of the Pleistocene and Holocene sediments (age, origin, process, landform morphology) and their relation to the tectonic history of the region. In particular, address why Pleistocene surfaces of increasing age in this area are tilted at increasingly high angles as described in several of the references cited and whether the tilting is related to fault movement.

02.05.01-2

Please label examples of Gravity Feature J on Figure 2.5S.1-15 or Figure 2.5S.1-20 and Gravity Feature E on Figure 2.5S.1-21 and 1-22.

02.05.01-3

Section 2.5S.1.1.4.4.3 describes that "basement block bounding faults formed during the extensional episode have been interpreted within both the thick and thin transitional crust." Also, according to Figure 2.5S.1-15, the site region is underlain by thick and thin transitional crust. Thus, the geologic setting and tectonic history of much of the site region is similar to other regions where large historic earthquakes have occurred, such as Charleston, South Carolina. Please provide additional information on strong earthquake potential for thick and thin transitional crustal structures beneath the site region.

02.05.01-4
Section 2.5S.1.1.4.4.5.1 describes that normal faults of the Mt. Enterprise-Elkhart Graben System (MEEG) displace gravel of late Quaternary age, but also says that seismic reflection data indicate that the faults are rooted in Jurassic salt and that movement of salt at depth probably drives slip on the faults. Please provide a more detailed summary of the data (including deposits, landform morphology, and updated ideas on age [see Collins et. al. 1980; Reference 2.5S.1-121]) for late Quaternary faulting on the MEEG. Provide a more detailed discussion of whether or not salt movement at depth could produce modern slip of 4mm/yr on overlying normal faults, and whether stratigraphic relations of the displaced gravel favor sudden surface displacement of tens of centimeters or gradual creep. Please cite examples of other places in the Gulf Coast region, or other similar regions, where salt movement has caused similar rates of surface deformation.

02.05.01-5

Section 2.5S.1.1.4.4.5.1 references Section 2.5S.1.1.4.3.3, which appears to actually reference 2.5S.1.1.4.4.3. Likewise, Section 2.5S.1.1.4.4.3 is not correct in cross-referencing Section 2.5S.1.1.4.4.5.1. In addition, Section 2.5S.1.1.4.4.5.2 directs the reader to Section 2.5S.1.1.4.3.4.3 for a review of the Balcones Fault and Luling Fault Zones. This reference is incorrect. Please review and correct the references.

02.05.01-6

Section 2.5S.1.1.4.4.5.2 indicates that Collins et. al. 1990 (Reference 2.5S.1-134) concluded that there is a need for a paleoseismic study to determine if the Balcones fault zone is active. Please explain why you have not conducted such a study.

02.05.01-7

In Section 2.5S.1.1.4.4.5.4, you stated that Wheeler, 1999 (Reference 2.5S.1-70) assessed growth faults in the broad Gulf Coast region as unlikely to be a potential source of significant earthquakes and that this supports the conclusions reached in STP 1 and 2 updated final safety analysis report (UFSAR). Please summarize the earlier investigations directed at assessing the growth faults, including the objectives, methods used, and types, amounts, and locations of data acquired. Also, please summarize problems with interpretations of the data and the final conclusions of the earlier studies. Provide readable summarized figures from the UFSAR for STP 1 and 2 and the earlier PSAR showing locations and interpretations of key data used to support the conclusions. For those faults that potentially reach the surface (inferred from the earlier seismic investigations), discuss errors in projecting fault planes to the surface and provide a map that shows the approximate width of error bands on fault plane projections at the surface. Describe in detail trenching investigations used to preclude a faulting or folding origin for imagery-observed tonal anomalies (as defined in UFSAR for STP 1 and 2) near the site. Please state whether the investigations used trenches to assess the projections of faults A or I to the surface and, if so, describe those investigations in detail.

02.05.01-8

Seismic reflection, well log, and imagery data sources described in Section 2.5S.1.2.4.2.2.1 and Section 2.5S.1.2.4.2.2.1 were not capable of resolving the surface locations of growth faults. Please explain why the investigations for the STP COLA site did not include a LiDAR survey of the site area to reassess evidence for possible subtle surface folding or faulting along growth faults in the site area, particularly along the possible surface trace of fault I.

02.05.01-9

Section 2.5S.1.2.4.2.2.2 references Figures 2.5S.1-44 and 2.5S.1-45 as showing lineaments mapped from air photographs, yet Figure 2.5S.1-44 does not show any lineament. The legend of Figure 2.5S.1-45 indicates that purple lines are “Lineaments from aerial photographs,” yet no purple lines are on the map. Please provide detailed figures showing lineaments investigated in previous investigations with new lineaments or other features identified as part of investigations for the STP COLA site. Please explain why you only measured the topographic offset at four locations across

possible scarps along the surface projection of fault I. Please show error bands indicating uncertainty in projecting fault I to the surface on Figure 2.5S.1-46 and discuss the degree of association between the projections and the topographic gradients measured by the four profiles.

02.05.01-10

Please discuss whether or not the methods used to measure possible cumulative displacement across the projection of fault I in Section 2.5S.1.2.4.2.2.2 are capable of measuring displacements of a few tens of centimeters over hundreds of years. In addition to broad monoclinal folding, assess the potential for growth fault I to splay upward near the surface into many normal faults of small displacement over a zone tens to hundreds of meters wide. Given the late Holocene surface processes at the site, please discuss whether it is possible to preserve scarps with heights of, for example, 0.5 m, at the surface as a distinct topographic break for hundreds to thousands of years. Please explain why you inferred that the surface projection of fault I/GMO bends to the southeast around the reservoir.

02.05.01-11

Please explain how a cross section with the orientation of Figure 2.5S.1-47 and with contacts that die out as shown provides evidence for or against displacement on fault I/GMO between boreholes 431 and 432.

02.05.01-12

In Section 2.5S.1.2.4.3, you concluded that "there was no observed surface expression of this growth fault to suggest that it has been active since the deposition of the late Pleistocene Beaumont Formation." This conclusion depends on an estimate of the age of the geomorphic surface in the site area and of the rate of erosion of a scarp. How old is the surface in the site area? Please describe over what period of time, fault scarps of various heights can be preserved (such as 0.5 m and 1.0 m).

02.05.01-13

If comparison of growth faults identified or precluded in the UFSAR for STP 1 and 2 with the new data described in this report is "problematic," as stated in Section 2.5S.1.2.4.3, please explain why growth faults GMH and GMK could not project through the STP COLA site and why growth faults GMO and GMI could not project through the reservoir.

02.05.01-14

The first paragraph of Section 2.5S.1.2.4.3.1 states that the data "demonstrates that no new information has been developed to alter the conclusion of the UFSAR for STP 1 and 2 … that no growth faults project to the surface through the STP site." In contrast, the second paragraph says that there is evidence of localized tilting and down-to-the-south monoclinal flexure of the ground surface above two growth faults within the 5-mile site radius. Please reconcile these two seemingly conflicting statements. Also, the UFSAR for STP 1 and 2 included an extensive discussion of possible subsidence in the site area due to withdrawal or injection of water, oil, and gas from wells in the area. If growth faults are

present near the reservoir, describe the potential for future subsidence to differential displacement across the faults.

02.05.01-15

As illustrated in Figure 2.5S. 1-8, 1-15, 1-16, and Plate 6 of Reference 2.5S.1-23, faults that were active during Mesozoic rifting and are now buried by 3-15 kilometers of Mesozoic and Cenozoic deposits are likely to occur below the site region. Direct study of these buried faults in outcrop or in excavations is not possible. Elsewhere in the Central and Eastern U. S. (CEUS) where similar geologic conditions exist, researchers used liquefaction features induced by large earthquakes to estimate timing, source areas, magnitudes, and recurrence intervals of large prehistoric earthquakes. Holocene and Late Pleistocene deposits (e.g., fluvial, deltaic, beach and back beach deposits) that are likely to be susceptible to liquefaction during large earthquakes occur in the STP site region. Please explain why you did not search for liquefaction features potentially produced during large earthquakes in the site region.

02.05.01-16

Please explain the units marked as “Bay City,” “El Campo,” and “Lolita” in Figure 2.5S.1-14. What are their origin and age and what are their relevance to the site? Are these units consistent with current ideas on sediments and landforms of this age in Blum and Aslan (2006) and references therein?

02.05.01-17

Figure 2.5S.1-17 shows earthquakes and salt diapirs with similar symbols and colors. Please provide a new version of the figure with earthquakes clearly distinguished from the diapirs.