2.5S.3 Surface Faulting

The following site-specific supplement addresses COL License Information Item 2.25.

Subsection 2.5S.3 contains an evaluation of the potential for tectonic surface deformation and non-tectonic surface deformation at the STP 3 & 4 site. Information contained in Subsection 2.5S.3 was developed in accordance with both RG 1.165 and RG 1.208 and is intended to demonstrate compliance with 10 CFR 100.23, Geologic and Seismic Siting Criteria.

This subsection contains information on:

- Potential surface deformation associated with capable tectonic sources
- Potential surface deformation associated with growth faults
- Potential surface deformation associated with non-tectonic processes, such as collapse structures (karst collapse), subsurface salt migration (salt domes), volcanism, and man-induced deformation (e.g., mining collapse, subsidence due to fluid withdrawal)

To summarize the conclusions of this subsection, there are no capable faults and negligible potential for non-tectonic fault rupture within the STP site vicinity. The STP site lies within a regional belt of potentially active growth faults along the Gulf coast. However, detailed studies of the site area show that there are no growth faults whose surface projections lie within the STP site, and thus there is negligible potential for growth-fault-related surface deformation at the STP site, and no other potential for non-tectonic deformation in the site area. In accordance with RG 1.165 and RG 1.208, the exposed surfaces of open excavations for the safety-related structures of STP 3 & 4 will be geologically mapped in order to identify and evaluate any geologic features that might pose a hazard to the facility. The NRC will be notified when these excavations are open for inspection.

The following sections contain the data, observations, and references to support these conclusions.

2.5S.3.1 Geological, Seismological, and Geophysical Investigations

An extensive body of information regarding the potential for surface faulting is available for the STP 3 & 4 site and is documented in several primary sources:

- Previous site investigations described in the STP 1 & 2 UFSAR Section 2.5 (Reference 2.5S.3-1)
- Geologic mapping published by the U.S. Geological Survey (USGS), the State of Texas, and other researchers (Reference 2.5S.3-2)
- Geophysical and tectonics articles published by various researchers in refereed journals and field trip guidebooks

- Seismicity data compiled and analyzed in published journal articles, EPRI (Reference 2.5S.3-3), and the updated seismicity catalog (Subsection 2.5S.2)

In addition to reviewing this existing information, the following investigations were performed to assess the potential for tectonic and non-tectonic deformation within the STP site area:

- Compilation and review of existing data and literature, with emphasis on reports published since the STP 1 & 2 UFSAR (Reference 2.5S.3-1) and EPRI (Reference 2.5S.3-3) studies
- Interpretation of aerial photography and remote sensing imagery
- Field and aerial reconnaissance
- Review of pre- and post-EPRI seismicity
- Discussions with current researchers in the area

2.5S.3.1.1 Previous Site Investigations

The results of previous geology and seismology investigations at the STP site are presented in Section 2.5 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1). The previous work documented the absence of tectonic faulting within the site area and it provides the following results documenting the absence of Quaternary faults at and within the area of the STP site:

- Interpretation of air photos, satellite imagery, and topographic maps: Evaluation of a variety of remote sensing imagery is documented in Subsection 2.5.1 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1). Numerous tonal lineaments were identified on the imagery and investigated in the field. Reference 2.5S.3-1 contains documentation and conclusions that the lineaments were associated with recent and old cultural features, vegetation patterns, soil-type changes related to stratigraphic facies variations, concentrations of mima mounds (gilgai), and apparent alignments of non-related features. Reference 2.5S.3-1 contains documentation that there is no evidence of surface rupture, surface warping, or offset of geomorphic features indicative of active faulting.

- Seismicity analysis: The STP 1 & 2 UFSAR (Reference 2.5S.3-1) describes the analysis of regional seismicity. This analysis documented that no earthquakes had been reported within 80 miles of the STP site and that no capable faults were present in the site region. Subsection 2.5.2 of the STP 1 & 2 UFSAR concluded that there was no association of significant seismic activity with known faulting in the site region.

- Detailed analysis of geotechnical boring data: Subsection 2.5.1 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) describes an extensive subsurface exploration program to evaluate the site geomorphology, stratigraphy, lithology, structure, and tectonics. The program included a total of 157 borings: standard penetration tests with 2-inch-diameter split-spoon sampling, 3-inch and 6-inch-diameter thin-wall

tube sampling, 3-inch-diameter thin-wall stationary piston sampling, static cone penetration testing (CPT), test pits, and piezometer installations (Reference 2.5S.3-1). The data were used to demonstrate that there are no geologic structures or other geologic hazards at the site and in the near vicinity that would represent a threat to the facility.

- Analysis of seismic reflection data: Subsection 2.5.1 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) describes a detailed program to acquire and interpret seismic reflection data within the site area to identify and characterize growth faults in the subsurface. Based on analysis and interpretation of these data, the STP 1 & 2 UFSAR in Subsections 2.5.1 and 2.5.3 concluded that all growth faults in the site area, except two, die out in strata of Miocene age or older, and thus have not been active since Miocene time. Two of the identified growth faults (growth faults "A" and "I", as described in Subsection 2.5.1.2.5.3 of the STP 1 & 2 UFSAR [Reference 2.5S.3-1]) extend into Miocene strata and to within 800 ft. to 1000 ft. of the ground surface, but do not displace shallow reflectors or the ground surface.

- Field Investigations: Field reconnaissance studies were performed to evaluate features identified during analysis of remote sensing imagery, as well as the two growth fault features interpreted on seismic reflection profiles. Subsection 2.5.1.2.5 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) contains documentation that there is no evidence for tectonic or non-tectonic surface faulting within the site area.

2.5S.3.1.2 Regional and Local Geological Studies

The U.S. Geological Survey (USGS) completed a compilation of all Quaternary faults, liquefaction features, and possible tectonic features in the central and eastern United States, including the Gulf Coastal Plain region (References 2.5S.3-4 and 2.5S.3-5). These compilations do not show any Quaternary tectonic faults or tectonic features within the STP site vicinity.

As discussed in Subsection 2.5S.1.1.4.4.5.4, evidence for Quaternary activity in the form of surface deformation has been documented on some growth faults in the Texas Coastal Plain. As noted by Wheeler (Reference 2.5S.3-6):

> The gulf-margin normal faults in Texas are assigned as Class B structures due to their low seismicity and because they may be decoupled from underlying crust, making it unclear if they can generate significant seismic ruptures that could cause damaging ground motion.

The definition of a Class B structure, in accordance with U.S. Geological Survey criteria (Reference 2.5S.3-5), is as follows:

> Class B: Geologic evidence demonstrates the existence of Quaternary deformation, but either (1) the fault might not extend deeply enough to be a potential source of significant earthquakes, or (2) the currently available geologic evidence is too strong to confidently assign the feature to Class C but not strong enough to assign it to Class A.

In contrast, a Class A structure exhibits “geologic evidence (that) demonstrates the existence of a Quaternary fault of tectonic origin, whether the fault is exposed by mapping or inferred from liquefaction or other deformational features” (Reference 2.5S.3-5).

The assessment of the U.S. Geological Survey (Reference 2.5S.3-6) is, consistent with the data in Subsection 2.5.1 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) and studies published since the EPRI study (Reference 2.5S.3-3) (see discussion in Subsection 2.5S.1.1.4.4.5.4), that growth faults are confined to the Coastal Plain section and do not extend into the crystalline basement. The assessment of the U.S. Geological Survey (Reference 2.5S.3-6) that growth faults will not generate significant seismic ruptures also is consistent with the conclusion in Subsection 2.5.1 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) that the sediments involved in growth faulting do not have sufficient elastic strength to store strain energy that can be released in moderate to large earthquakes.

Since the analyses described in the STP 1 & 2 UFSAR (Reference 2.5S.3-1), additional analysis and mapping of the subsurface geology in the site vicinity has been published to document the locations of growth faults. This mapping is tabulated and described in Subsection 2.5S.1.2.4.2.2.2. This mapping supports the analysis and conclusions of the UFSAR regarding the locations of growth faults in the site area, and it specifically indicates that no previously unknown or undocumented growth faults have been identified in the site area.

2.5S.3.2 Geological Evidence, or Absence of Evidence, for Surface Deformation

2.5S.3.2.1 Bedrock Faults

As shown on Figure 2.5S.1-27, no bedrock faults have been mapped within the STP 3 & 4 site area (Subsection 2.5S.1.2.4.1).

2.5S.3.2.2 Growth Faults

2.5S.3.2.2.1 Previous Studies for the STP 1 & 2 UFSAR

As discussed in Subsection 2.5S.1.2.4.1.2.1, Subsection 2.5.1.2.5.3 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) documents the presence of 10 growth faults within the greater site area. These faults are confined to the Mesozoic and Cenozoic Gulf Coastal Plain stratigraphic section and do not extend into the underlying crystalline basement. Subsection 2.5.1.2.5.3 of the STP 1 & 2 UFSAR presents seismic reflection and borehole data that demonstrate 8 of the 10 growth faults are buried by 3900 ft. or more of undisturbed sediments that are at least Pliocene and probably Miocene in age or younger, indicating that there has been no movement on these 8 faults in the past approximately 3 million years or longer. Two of these growth faults (“A” and “I”; Figure 2.5S.1-43) exhibit evidence for Miocene to Pliocene or younger deformation and can be traced on seismic reflection profiles to within 900 ft. or less of the ground surface. The closest approach of growth faults “A” and “I” to the STP site is approximately 3.0 miles and 3.8 miles, respectively. Subsection 2.5.1.2.5.3 of the STP 1 & 2 UFSAR notes that this depth range is the effective limit of resolution of the seismic reflection

data, and thus the reflection data cannot be used to assess whether the faults approach closer to the surface. Based on field reconnaissance and inspection of a shallow excavation along the western margin of the main cooling water reservoir, Subsection 2.5.1.2.5.3 of the STP 1 & 2 USFAR (Reference 2.5S.3-1) contains conclusions that there is no discrete displacement of the land surface, or of continuous stratigraphic contacts in the shallow subsurface, above the up-dip projections of growth faults “A” and “I.”

2.5S.3.2.2.2 Current Investigations

Subsection 2.5S.1.2.4.2.2.1 contains discussions of the compiled mapping and subsurface data that document the location and geometry of growth faults in the site area. These data support the mapping of growth faults in the site area documented in Subsection 2.5.1.2.5.3 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1), and do not indicate the presence of any additional growth faults not recognized during the UFSAR investigations for STP 1 & 2. Specifically, there are no previously published data or new data that indicate the presence of growth faults whose surface projection approaches within the site.

New air photo analysis and aerial and field reconnaissance were performed for this COL investigation to assess the surface expression or lack of surface expression of growth faults “A” and “I,” as well as other growth faults in the site area. This analysis is described in detail in Subsection 2.5S.1.2.4.2.2.2, and the main observations are summarized as follows:

- Lineaments identified on aerial photographs, similar to lineaments discussed in Subsection 2.5.1.2.5.5 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1), are locally associated with subtle down-to-the-south slope breaks, vegetation lineaments, and linear drainages. Lineaments identified along growth fault “I” are more pronounced and obvious than other lineaments mapped in the site area.

- Subtle south-facing topographic breaks along growth fault “I,” initially identified from interpretation of aerial photography, were discernable in aerial reconnaissance. No slope breaks or other geomorphic features potentially indicative of deformation of the surface of the Beaumont Formation were observed in association with other lineaments in the site area during aerial or field reconnaissance, consistent with conclusions of the Subsection 2.5.1.2.5.5 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1).

- Three topographic profiles that were surveyed using a total-station instrument document local down-to-the-south relief of the land surface across growth fault “I” at distances of approximately 4.8 miles and greater from the site area. The deflection of the land surface is characterized as a variable south-facing monoclinal flexure, exhibiting about 1.5 ft. to 6 ft. of total relief over horizontal distances ranging from about 180 ft. to 500 ft. The monoclinal flexures represent a localized increase of about 0.3° to 0.8° in the southward gradient of the land surface above the buried tip of growth fault “I.”

- A north-south topographic profile measured along the western margin of the main cooling water reservoir shows substantial short-wavelength topographic relief due to non-tectonic natural and cultural modifications of the land surface, but no consistent and well-expressed south-down tilting across the surface projection of growth fault "I." Although the short-wavelength relief makes it difficult to confidently identify and correlate uneroded remnants of the upper surface of the Beaumont Formation adjacent to the cooling water reservoir, we conclude that there is no south-facing monoclinal tilting that can be unequivocally determined within the resolution of the survey. This conclusion is consistent with shallow trench observations discussed in Subsection 2.5.1.2.5.6 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) that document no deformation of continuous, stratified bedding in the Beaumont Formation above the updip projection of growth fault "I" along the western margin of the cooling water reservoir.

- An east-west cross section (C-C'; Figure 2.5S.1-47) of interpreted and correlated borehole data along the southern margin of the main cooling water reservoir documents lateral variation and interfingering of sand and clay textural facies of the late Pleistocene Beaumont Formation in the vicinity of the updip projection of the growth fault "I," but no positive evidence for systematic displacement or offset of stratigraphic contacts. Given the extremely low relief across the slope breaks that we tentatively associate with growth fault "I" to the west (i.e., about 1.5 ft. to 5 ft.), it is possible that comparable displacements at depth would not be discernable within the resolution of cross section C-C'.

The geomorphic relations described above are interpreted as variable south-down deformation of the upper surface of the Beaumont Formation above the buried tip of growth fault "I." The deformation is characterized by very low-amplitude homoclinal flexure of the land surface, suggesting that the deformation is related to local fault-propagation folding above the buried tip of growth fault "I." The closest documented geomorphic expression of potential surface tilting, due to movement on growth fault "I" to the site area is located at a distance of about 4.8 miles. Survey data along the western margin of the cooling reservoir at a distance of about 3.2 miles from the site reveal no obvious monoclinal tilting of the surface of the Beaumont Formation, consistent with shallow excavation exposures of undeformed stratigraphy in the Beaumont Formation discussed in Subsection 2.5.1.2.6.6 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1).

Although there is *prima facie* evidence for late Quaternary movement on local reaches of growth fault "I" within the site area, the closest approach of growth fault "I" to the site is 3.8 miles, and thus there is no potential for permanent ground deformation from activity on this structure within the site.

2.5S.3.3 Correlation of Earthquakes with Capable Tectonic Sources

There is no seismicity within the site vicinity of STP 3 & 4 (Figure 2.5S.2-8), and as such there is no spatial correlation of earthquake epicenters with known or postulated faults, other tectonic features, or other geomorphic features.

As part of this COL application, the EPRI earthquake catalog was updated to incorporate southern United States and Gulf of Mexico earthquakes that occurred between 1984 and 2006. The updated earthquake catalog contains no earthquakes with body wave magnitude (m_b) $\geq$ 3.0 within the site vicinity. No reported historical earthquake epicenters have been associated with buried bedrock faults or growth faults within the site vicinity (Figure 2.5S.1-42).

Subsection 2.5.2.1 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) discussed reports of microearthquake activity associated with growth faults in Brazoria County, Texas, and Percperdue, Vermillion Parish, Louisiana, but noted that no events with magnitudes larger than 1.5 have been reported.

The February 10, 2006 Emb 5.5 earthquake in the Gulf of Mexico (discussed in Subsection 2.5S.2.3) has been proposed by M. Nettles (Reference 2.5S.2-7) to be related to gravity sliding on a low-angle normal fault at the edge of the continental shelf; however, no other events within the updated catalog have been attributed to such mechanisms.

2.5S.3.4 Ages of Most Recent Deformation

2.5S.3.4.1 Conclusions of the STP 1 & 2 UFSAR

As summarized in Subsection 2.5.S.1, the most recent bedrock deformation in the site region occurred during the Mesozoic and is related to rifting that led to development of the Gulf of Mexico basin. As the Gulf of Mexico opened, basement crust beneath the STP 3 & 4 site subsided and became part of a passive continental margin. The passive margin crust was progressively buried by Mesozoic and Cenozoic marine deposits of the Gulf of Mexico, and it presently is at a depth of about 6.6 miles beneath the STP site. There is no documented evidence of faulting in the basement younger than Mesozoic in age beneath the STP site.

Subsection 2.5.1.2.5 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) identified 10 growth faults in the subsurface of the STP 1 & 2 site area. The UFSAR presented evidence that:

- Eight of the 10 growth faults are overlain by undeformed deposits of at least Pliocene and probably Miocene age or older. Based on these relations, the UFSAR concluded that these eight growth faults have not been active since approximately Miocene time.

- Two of the 10 growth faults (growth faults “A” and “I”) deform sediments of Miocene-Pliocene age, and possibly younger. Based on field reconnaissance and examination of shallow exposures, Subsection 2.5.1.2.5.6 of the STP 1 & 2 UFSAR concluded that there was no discrete displacement of the land surface, or bedding in the shallow subsurface, at the updip projections of growth faults “A” and “I” in the site area. Given that the Beaumont Formation deposits that directly underlie the land surface in the site area are about 100,000 years old (Reference 2.5S.3-2), these relationships imply that there has been no discrete surface faulting in the past approximately 100,000 years.

2.5S.3.4.2 Results of Current Investigations

Based on interpretation of aerial photography, aerial reconnaissance, field reconnaissance, and topographic surveys, there is *prima facie* evidence for localized, low relief tilting of the upper surface of the Beaumont Formation above growth fault "I" at a distance of 4.8 miles from the site. The deformation is characterized by south-down monoclinal flexure of the land surface, and is distributed across a horizontal distance that ranges from 180 ft. to 500 ft. at the sites evaluated for this COL application. Survey and field data acquired within the site area clearly document the absence of discrete surface rupture above growth fault "I." Topographic profiles surveyed at intervals over a distance of several miles document significant variability in the magnitude and width of the zone of tilting, suggesting that activity is not uniform along strike. Surface deformation above growth fault "I" does not occur within the STP site. Based on a review of available published geologic literature, field and aerial reconnaissance, and interpretation of aerial photography, no other growth faults within the 5-mile site area exhibit evidence of Quaternary activity.

2.5S.3.5 Relationship of Tectonic Structures in the Site Area to Regional Tectonic Sources

There are no tectonic bedrock faults within the STP site area. Growth faults, which are confined to the Gulf Coastal Plain stratigraphic section and do not involve the basement, have been mapped in the site area and are associated with the Frio fault zone, which has been mapped for a minimum of 500 mi along trend in the Gulf Coastal Plain (see discussion in Subsection 2.5S.1.1.4.4.4.2). Although the Frio zone of growth faults is regionally extensive, it is designated a "Class B" feature by the U.S. Geological Survey (References 2.5S.3-5 and 2.5S.3-6) because it is unclear that growth faults are capable of producing significant seismic rupture and associated strong vibratory ground motion (see discussion in Subsection 2.5S.2.1.1.2). Subsection 2.5.2.4 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) concluded that growth faults are not capable of storing significant elastic strain energy to produce moderate to large earthquakes. Consequently, we conclude there is no correlation of geologic structures in the site area to regional, capable tectonic sources.

2.5S.3.6 Characterization of Capable Tectonic Sources

Based on data presented in Subsection 2.5S.1 and previous discussions in Subsection 2.5S.3.4, there are no capable tectonic sources within the STP site area.

2.5S.3.7 Designation of Zones of Quaternary Deformation in the Site Region

There are no zones of Quaternary deformation associated with tectonic faults requiring detailed investigation within the site area. A review and interpretation of aerial photography and available geotechnical boring logs, coupled with aerial and field reconnaissance, identified possible Quaternary deformation associated with growth fault "I" in the site area. However, the closest approach of the surface projection of growth fault "I" to the STP 3 & 4 site is 3.8 miles. Thus no further investigations were conducted to better characterize growth fault "I."

2.5S.3.8 Potential for Surface Tectonic Deformation at the Site

2.5S.3.8.1 Potential for Surface Tectonic Deformation at the Site

The potential for tectonic deformation at the site is negligible. There are no capable tectonic faults within the site vicinity.

2.5S.3.8.2 Potential for Non-Tectonic Deformation

The potential for non-tectonic deformation at the site is negligible. Soils within the site area are not susceptible to karst-type dissolution collapse or to subsidence due to fluid withdrawal.

There are non-tectonic growth faults within the site area that have deformed sediments younger than late Miocene, and growth fault "I" locally exhibits evidence for Quaternary activity in the form of monoclinal tilting of the surface of the late Pleistocene Beaumont Formation. The potential for surface deformation associated with growth fault activity is discussed in the following section.

2.5S.3.8.2.1 Growth Faults

The potential for non-tectonic deformation at the STP site from movement on growth faults is negligible. As summarized in Subsection 2.5S.1.2.4.2.1, previous detailed studies of growth faults in Subsection 2.5.1.2.5.6 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) documented the absence of growth faults that project to the surface within the STP site. The UFSAR identified only two growth faults within the site area that deform sediments younger than late Miocene. Of these two structures, only growth fault "I" exhibits *prima facie* evidence for Quaternary activity, and the closest approach of the surface projection of growth fault "I" to the STP site is about 3.8 miles. Future activity on growth fault "I," if any, will not impact the STP 3 & 4 site.

2.5S.3.8.2.2 Other Potential Sources of Non-Tectonic De-formation

There is no evidence of non-tectonic deformation at the STP 3 & 4 site in the form of glacially-induced faulting, collapse structures, salt migration, or volcanic intrusion:

- All documented faulting within the site vicinity is attributed by researchers to movement on growth faults, the activity of which is related to sediment compaction, dewatering, and flow of salt in the subsurface.
- There are no documented examples of glacially-induced faulting in the site region.

Subsection 2.5.1.1.6.6.7.1 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) concluded that there were no deposits of limestone or other carbonate rocks at shallow depth within the STP site area that pose potential collapse and surface subsidence hazards. There are no new data since of the studies documented in the STP 1 & 2 UFSAR (Reference 2.5S.3-1) that contradict these conclusions.

No piercement-type salt domes are located within the site area. As noted in Subsection 2.5.1.1.6.6.7 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1), the closest salt dome to the STP site is Big Hill Salt Dome, located 10 miles from the site. No data

collected since of the studies documented in the STP 1 & 2 UFSAR (Reference 2.5S.3-1) indicate the presence of any previously unknown salt domes within 10 miles of the STP site (Reference 2.5S.3-8).

The Texas Gulf Coast is part of a stable intraplate region, and there are no volcanic rocks of any age mapped within the site vicinity. Based on a review of geologic literature, there is no documented intrusive or extrusive volcanic activity of Tertiary age within the site region. The youngest documented magmatic activity in the site region is Mesozoic in age and is spatially associated with the Balcones fault zone (Reference 2.5S.3-9) at a distance of about 138 miles from STP 3 & 4.

There are no mining activities within the site area that may produce man-induced surface collapse.

As discussed extensively in Subsection 2.5.1.1.6.6.7.2 of the STP 1 & 2 UFSAR (Reference 2.5S.3-1), the STP site is considered a non-productive future source of oil and gas because of unfavorable structural and stratigraphic conditions extending to a minimum depth of 10,000 ft.

As discussed in Subsection 2.5S.1.2.6.5, subsidence as a result of dewatering of the shallow aquifer(s) and/or removal of potential petroleum resources from beneath the STP 3 & 4 site is not anticipated to be significant. The maximum anticipated subsidence at STP due to construction dewatering is between 0.04 and 0.05 ft. Because there are other considerations, such as infiltration by stormwater, which will replace some of the water in the aquifer, it is unlikely that subsidence will reach this level. There are no new data contradicting the conclusion of the STP 1 & 2 UFSAR (Reference 2.5S.3-1) that subsidence of the land surface from hydrocarbon extraction will not occur at the STP 3 & 4 site.

2.5S.3.9 References

2.5S.3-1 “STPEGS Updated Final Safety Analysis Report, Units 1 and 2,” Revision 13, April 2006.

2.5S.3-2 “Signatures of Climate vs. Sea-Level Change within Incised Valley-Fill Successions: Quaternary Examples from the Texas Gulf Coast,” Sedimentary Geology, v. 190, p. 177-211, Blum, M.D., and Aslan, A., 2006.

2.5S.3-3 “Seismic Hazard Methodology for the Central and Eastern United States, Tectonic Interpretations,” v. 5 through 10, Electric Power Research Institute (EPRI), 1986.

2.5S.3-4 “Data For Quaternary Faults, Liquefaction Features, and Possible Tectonic Features in The Central And Eastern United States, East of the Rocky Mountain Front,” United States Geological Survey Open-File Report 00-260, Crone, A.J., and Wheeler, R.L., 2000.

2.5S.3-5 "Known or Suggested Quaternary Tectonic Faulting, Central and Eastern United States-New and Updated Assessments for 2005," U.S. Geological Survey Open-File Report 2005-1336, Wheeler, R.L., 2005.

2.5S.3-6 "Fault Number 924, Gulf-Margin Normal Faults, Texas," Quaternary fault and fold database of the United States, U.S. Geological Survey, Wheeler, R.L., compiler, 1999. Available at http://earthquakes.usgs.gov/regional/qfaults, accessed May 16, 2007.

2.5S.3-7 "Analysis Of The 10 February 2006 Gulf Of Mexico Earthquake from Global Regional Seismic Data," Offshore Technology Conference Paper No. 19099, Nettles, M., 2007.

2.5S.3-8 "Upper Texas Gulf Coast Mapping Service Maps 327 and 328," Geomap, 2007, Licensed from Geomap Company to William Lettis and Associates, Inc. from February 1, 2007 to January 31, 2008.

2.5S.3-9 "Igneous Activity," The Geology of North America, v. J, The Gulf of Mexico Basin, pp. 91-108, Byerly, G.R., Geological Society of America, 1991.