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SCE&G®
A SCANA COMPANY

May 13, 2009
NND-09-0112

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

ATTN: Document Control Desk

Subject: Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 Combined License Application (COLA) - Docket Numbers 52-027 and 52-028 Response to NRC Request for Additional Information (RAI) Letter No. 034

Reference: Letter from Ravindra G. Joshi (NRC) to Alfred M. Paglia (SCE&G), Request for Additional Information Letter No. 034 Related to SRP Section 2.5.3 for the Virgil C. Summer Nuclear Station Units 2 and 3 Combined License Application, dated February 12, 2009.

The enclosure to this letter provides the South Carolina Electric & Gas Company (SCE&G) responses to all the RAI items included in the above referenced letter. The enclosure also identifies any associated changes that will be incorporated in a future revision of the VCSNS Units 2 and 3 COLA.

Should you have any questions, please contact Mr. Al Paglia by telephone at (803) 345-4191, or by email at apaglia@scana.com.

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

Executed on this 13th day of May, 2009.

Sincerely,

Ronald B Clary

Ronald B. Clary
General Manager
New Nuclear Deployment

AMM/RBC/am

Enclosure

D083
NRO

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NRC RAI Letter No. 034 Dated February 12, 2009

SRP Section: 2.5.3 – Surface Faulting

Questions from Geosciences and Geotechnical Engineering Branch 1 (RGS2)

NRC RAI Number: 02.05.03-1

FSAR Section 2.5.3.2 (pgs 2.5.3-5 through 2.5.3-9) discusses 12 bedrock faults which occur within the site vicinity and range in age from Paleozoic to Cenozoic. These faults are summarized in Table 2.5.3- 201 and also discussed in FSAR Section 2.5.1.1.2.4 and Section 2.5.3.4. There is no single figure that shows all 12 faults in the site vicinity relative to lithotectonic units (e.g., the tectonic features map of FSAR Figure 2.5.1-212 labels most, but not all, of these faults and does not include color patterns shown on the map, except that for Mesozoic basins, in the figure legend), and logic for the assigned ages is not summarized in Table 2.5.3-201 or in FSAR Section 2.5.3.4.

In order for the staff to understand the tectonic setting of the site vicinity in relation to these 12 bedrock faults, please accomplish the following:

(a) Locate all 12 structures on a single lithotectonic map of the site vicinity and include a legend which distinguishes both fault ages and lithotectonic units.

(b) Summarize the logic presented in FSAR Section 2.5.1.1.2.4 which is used to qualify ages of these 12 faults, possibly in a modified Table 2.5.3-201.

(c) Include in Section 2.5.3 the information provided in response to RAIs for Section 2.5.1 which is related to these 12 faults, as appropriate.

VCSNS RESPONSE:

(a) RAI Figure 02.05.03-1.1 shows the 12 faults within the site vicinity. FSAR Figure 2.5.1-204b provides a detailed explanation for RAI Figure 02.05.03-1.1.

(b) Revised FSAR Table 2.5.3-201 provides information used to assign ages to the 12 faults within the site vicinity.

(c) FSAR Subsection 2.5.3.4 text will be revised as described in response to RAI 02.05.03-4. Also, as noted in item (b) above, the revised FSAR Table 2.5.3-201 provides information used to assign ages to the 12 faults within the site vicinity.

This response is PLANT SPECIFIC.

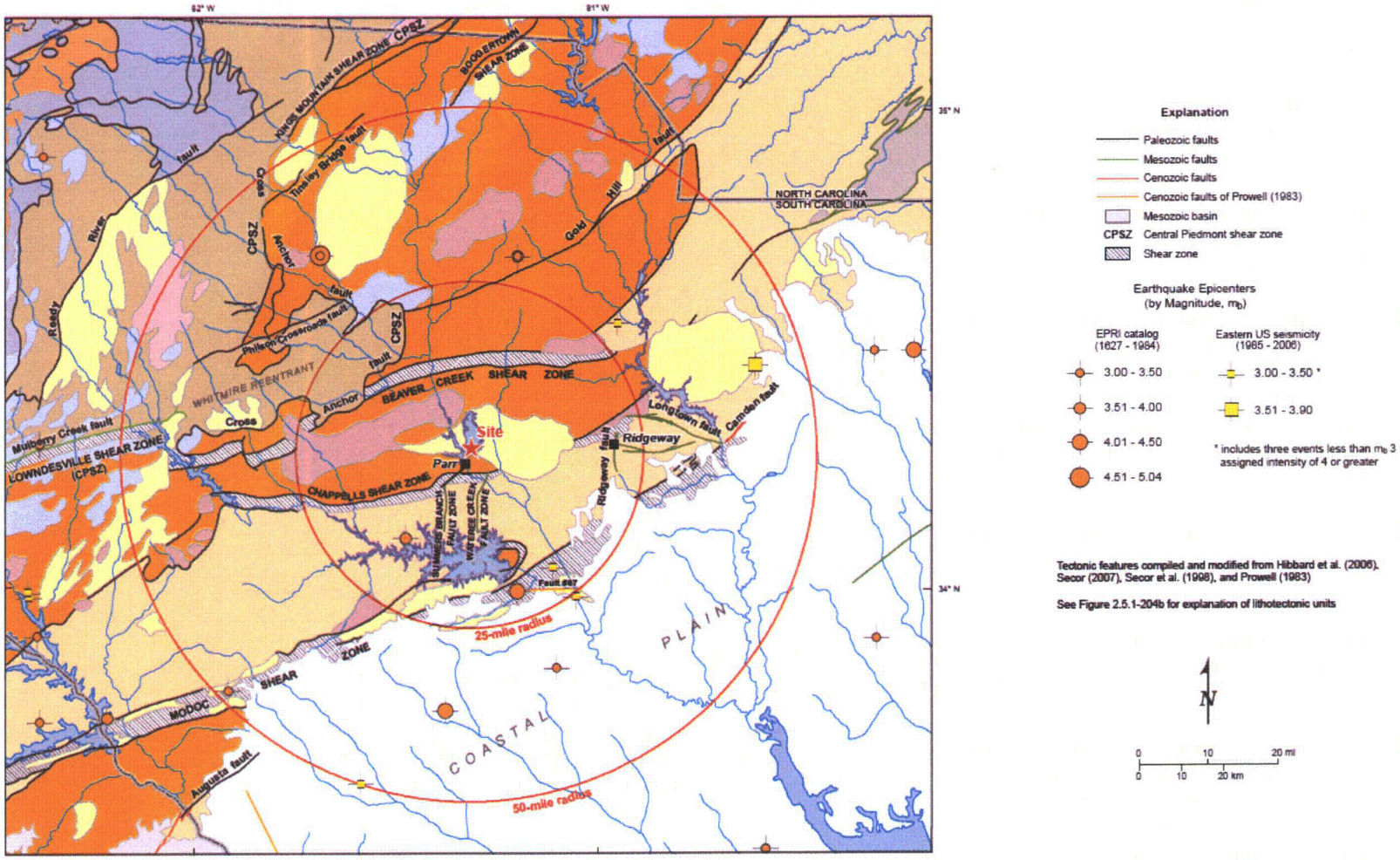
ASSOCIATED VCSNS COLA REVISIONS:

The following changes to the FSAR will be incorporated in a future revision of the VCSNS Units 2 and 3 COLA:

Revised FSAR Table 2.5.3-201 is attached.

ASSOCIATED ATTACHMENTS:

RAI Figure 02.05.03-1.1
Revised FSAR Table 2.5.3-201



RAI Figure 02.05.03-1.1. 50-Mile Tectonic Features Map

Explanation

- Paleozoic faults
- Mesozoic faults
- Cenozoic faults
- Cenozoic faults of Prowell (1983)
- Mesozoic basin
- CPSZ Central Piedmont shear zone
- Shear zone

Earthquake Epicenters (by Magnitude, m_b)

EPRI catalog (1627 - 1984)	Eastern US seismicity (1985 - 2006)
3.00 - 3.50	3.00 - 3.50 *
3.51 - 4.00	3.51 - 3.90
4.01 - 4.50	
4.51 - 5.04	

* includes three events less than m_b 3 assigned intensity of 4 or greater

Tectonic features compiled and modified from Hibbard et al. (2006), Secor (2007), Secor et al. (1998), and Prowell (1983)

See Figure 2.5.1-204b for explanation of lithotectonic units

N

0 10 20 mi
0 10 20 km

Table 2.5.3-201
Summary of Bedrock Faults Mapped Within the 25-Mile VCSNS Site Vicinity

Feature Name	Distance from Site (mi)	Mapped Length (mi)	Orientation	Assigned Age	Basis for Assigned Age
Beaver Creek shear zone	10	>50	ENE-NE	Paleozoic	Paleozoic Newberry granite crosses but not deformed by shear zone (Reference 230).
Chappells shear zone	2	60	NE-ENE	Paleozoic	Paleozoic (Reference 211) Winnsboro pluton crosses but not deformed by shear zone (Reference 230).
Cross Anchor fault	10	>60	Variable	Paleozoic	Pre- to syn-kinematic Paleozoic granite crosses fault (Reference 230).
Fault #67 of Prowell (1983)	20	18	E	Cenozoic	5 ft vertical separation of Cenozoic Coastal Plain sand and gravel deposits (Reference 217).
Gold Hill fault extension	20	75	NE	Paleozoic	Paleozoic Concorde intrusive suite cut by fault (Reference 230); fault is truncated by the Paleozoic Cross Anchor fault (Reference 230).
Longtown fault	25	20	WNW	Mesozoic (minimum age)	Undeformed Jurassic diabase dikes cross fault (Reference 202).
Modoc shear zone	>12	20	NE	Paleozoic (possible localized Mesozoic reactivation)	$^{40}Ar/^{39}Ar$ ages indicate ductile fabrics formed in Paleozoic (Reference 216); localized silicified breccias suggest possible Mesozoic brittle reactivation (Reference 220).
Ridgeway fault	20	>9	N	Mesozoic (minimum age)	Association with Wateree Creek fault (Reference 220).
Summers Branch fault	6 [?]	8 [?]	N [?]	Mesozoic [?] (minimum age) (likely non-existent)	Association with Wateree Creek fault (Reference 220); parameters are queried indicating fault likely non-existent (References 216 and 221).
Unnamed fault near Parr	3 [?]	5 [?]	NE [?]	Paleozoic [?] (likely non-existent)	No data constraining age; parameters are queried indicating fault likely non-existent.
Unnamed fault near Ridgeway	20	9	E	Mesozoic (minimum age)	Six undeformed Triassic to Jurassic diabase dikes cross fault (References 202 and 220).
Wateree Creek fault	2	>8	N	Mesozoic (minimum age)	Undeformed Triassic to Jurassic diabase dike crosses fault (Reference 219).

NRC RAI Letter No. 034 Dated February 12, 2009

SRP Section: 2.5.3 – Surface Faulting

Questions from Geosciences and Geotechnical Engineering Branch 1 (RGS2)

NRC RAI Number: 02.05.03-2

FSAR Section 2.5.3.2 (pg 2.5.3-7) states that the Modoc shear zone separates the Carolina Terrane (including the Slate and Charlotte Belts) from the Kiokee belt. The terminology used in Section 2.5.3.2, however, is not consistent with other sections of the FSAR, which correctly refer to the "Carolina Zone," rather than the "Carolina Terrane," and the "Charlotte Terrane," rather than the "Charlotte Belt." In addition, the Kiokee belt is not defined or described anywhere in the FSAR, so its importance in the regional geologic setting of the Summer site is not clear.

In order for the staff to clearly understand the geologic setting of the Summer site in relation to regional geology and lithotectonic elements, please correctly distinguish the area which contains the infrastructural Charlotte Terrane. Please also locate the Kiokee Belt on the appropriate regional map and discuss its relationship to the Summer site.

VCSNS RESPONSE:

Based on synthesis of available data, Hibbard et al. (2002; 2006) (FSAR References 2.5.1-283 and 2.5.3-213) revamp the archaic "belt" terminology of the southern Appalachians. This more modern lithotectonic classification scheme associates the rocks formerly placed in the "Kiokee belt" with the Savannah River terrane (Hibbard et al. 2006) (FSAR Reference 2.5.3-213).

FSAR Subsection 2.5.3.2 will be revised to eliminate reference to the older "belt" terminology and to be consistent with other subsections of the FSAR. Specifically, FSAR Subsection 2.5.3.2 will be revised to describe the Modoc shear zone in terms of the lithotectonic elements defined by Hibbard et al. (2006) (FSAR Reference 2.5.3-213).

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

The following changes to the FSAR will be incorporated in a future revision of the VCSNS Units 2 and 3 COLA:

FSAR Subsection 2.5.3.2, pages 2.5.3-7 through 2.5.3-8 will be revised as follows:

- Modoc Shear Zone. At its nearest point, the Modoc shear zone is about 20 miles south of the VCSNS site (Figures 2.5.1-211, Figures 2.5.1-212, and 2.5.1-220). The Modoc shear zone is a region of high ductile strain separating the suprastructural Charlotte Terrane and infrastructural Carolina Terrane ~~(Carolina Slate and Charlotte belts)~~ from the amphibolite facies migmatitic and gneissic infrastructural rocks of the Uchee and Savannah River Terranes and the suprastructural rocks of the Milledgeville Terrane~~Kiokee belt~~ (References 205, 213, and 218) (Figure 2.5.1-202a). The northeast~~-trending~~ striking Modoc zone dips steeply to the northwest and can be traced through the Piedmont from central Georgia to central South Carolina based on geological and geophysical data. The shear zone appears to continue northeastward to North Carolina beneath the Coastal Plain, as demonstrated by ~~aero~~magnetic data (Figure 2.5.1-206). The Modoc shear zone contains fabrics characterized by brittle and ductile deformation produced during an early phase of the Alleghanian orogeny approximately 315 to 290 Ma (Reference 208). There is no evidence in the published literature for significant post-290 Ma slip on the Modoc shear zone.

ASSOCIATED ATTACHMENTS:

None

NRC RAI Letter No. 034 Dated February 12, 2009

SRP Section: 2.5.3 – Surface Faulting

Questions from Geosciences and Geotechnical Engineering Branch 1 (RGS2)

NRC RAI Number: 02.05.03-3

FSAR Section 2.5.3.3 (pg 2.5.3-10) states that no faults or geomorphic features within 80 km (50 mi) of the site can be correlated with earthquakes. This FSAR section also states that only three historical earthquakes of mb greater than or equal to 3 occur within 40 km (25 mi) of the site (i.e., within the site vicinity). However, FSAR Figure 2.5.1-212 shows that two of these three earthquakes appear to have epicenters which lie along the trend of the Modoc shear zone.

In order for the staff to assess the seismotectonic setting of the Summer site, please discuss the significance of the two earthquake epicenters that appear to lie along the trace of the Modoc shear zone within the site vicinity.

VCSNS RESPONSE:

FSAR Subsection 2.5.3.3 describes two small earthquakes located within the VCSNS site vicinity near the mapped location of the Modoc shear zone. These earthquakes are:

- The 5/20/1853 Emb 4.3 earthquake, located approximately 20 miles south-southeast of the site; and
- The 2/18/2005 Emb 3.17 earthquake, located approximately 20 miles southeast of the site.

As described in the response to RAI 2.5.1-39, the positional uncertainties of instrumentally recorded earthquakes, including the 2/18/2005 earthquake, are large in the region spanned by FSAR Figure 2.5.1-212. These large uncertainties are due to sparse and widely separated seismographic station installations. Larger still are the positional uncertainties of pre-instrumental earthquakes, including the 5/20/1853 earthquake. As such, no definite association can be made between these two earthquakes and the Modoc shear zone. Moreover, as described in FSAR Subsection 2.5.3.2, the Modoc shear zone dips northwest, whereas the epicenters of these two earthquakes plot on or southeast of the Modoc shear zone as mapped at the surface (FSAR Figure 2.5.1-212).

The overall earthquake location uncertainties in the area shown in FSAR Figure 2.5.1-212 are sufficiently large such that: (1) the definite association of seismicity with particular fault structures is precluded; and (2) the possibility that some earthquakes are located on faults mapped at the surface cannot be entirely precluded.

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

No COLA changes have been identified as a result of this response.

ASSOCIATED ATTACHMENTS:

None

NRC RAI Letter No. 034 Dated February 12, 2009

SRP Section: 2.5.3 – Surface Faulting

Questions from Geosciences and Geotechnical Engineering Branch 1 (RGS2)

NRC RAI Number: 02.05.03-4

FSAR Section 2.5.3.4 (pg 2.5.3-10) discusses the ages of the 12 faults identified in the site vicinity and states that two of these structures (i.e., Fault #67 of Prowell and the unnamed fault near Parr, if it exists) are likely non-tectonic in origin. The basis for this conclusion is not summarized for either feature. Furthermore, the unnamed fault near Parr is described in FSAR Section 2.5.3.2 (pg 2.5.3-9) as containing "shear fabrics" that could be indicative of a tectonic origin for this feature.

In order for the staff to assess whether or not these two features are non-tectonic in origin, please summarize the logic used for making this conclusion, including the significance of the "shear fabrics" observed where the unnamed fault was initially identified.

VCSNS RESPONSE:

The phrase "non-tectonic in origin" should not be used to describe Prowell's (1983) (FSAR Reference 2.5.1-217) fault #67. Likewise, the phrase "non-tectonic in origin" should not be used to describe Dames & Moore's (1972) (FSAR Reference 2.5.1-207) postulated unnamed fault near Parr. FSAR Subsection 2.5.3.4 will be revised to reflect a Cenozoic age for Fault #67, which was observed in a short-lived man-made exposure. This FSAR Subsection will also state that the postulated fault near Parr, if it exists, is inferred to be Paleozoic in age.

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

The following changes to the FSAR will be incorporated in a future revision of the VCSNS Units 2 and 3 COLA:

FSAR Subsection 2.5.3.4, page 2.5.3-10, will be revised as follows:

Of the twelve faults identified in the VCSNS site vicinity, ~~five~~ six are Paleozoic in age (i.e., Beaver Creek shear zone, Chappells shear zone, Cross Anchor fault, Modoc shear zone, and the Gold Hill fault extension, and the postulated fault of Dames & Moore 1972 near Parr); five are Mesozoic or pre-Mesozoic in age (Wateree Creek fault, Summers Branch fault [if it exists], Ridgeway fault, Longtown fault, and the unnamed fault of Secor et al. (Reference 220) and Barker and Secor (Reference 202) south of the Longtown

fault); and ~~two are likely nontectonic in origin~~one is Cenozoic in age (fault #67 of Prowell (1983) (Reference 217))~~ and the unnamed fault of Dames & Moore 1972 near Parr, South Carolina [if it exists])~~.

The Cenozoic fault #67 of Prowell (1983) (Reference 217) was temporarily exposed in a construction grade at the junction of Interstate 26 and US Route 76-176, located over 20 miles southeast of the site (Figure 2.5.1-212). As described by Prowell (1983) (Reference 217), "a number of reverse faults were exposed in excavation (now covered) but only one had substantial offset." The largest of these faults was oriented N80°E, 87°NW and exhibited 5 feet of vertical separation in Cenozoic Coastal Plain fluvial sand and gravel deposits.

The next nearest fault to the VCSNS site with demonstrable Cenozoic activity is the northeast striking Camden fault, about 40 miles east of the VCSNS site (see discussion in Subsection 2.5.1.1.2.4.3). Total slip on the Camden fault is unresolved, although Secor et al. (Reference 220) suggest total displacement on the order of kilometers is likely in order to explain the apparent disruption of crystalline rocks across the fault. Up-to-the-north vertical separation of the basal Late Cretaceous unconformity of about 50 to 80 feet suggests Late Mesozoic and possibly Cenozoic (pre-Oligocene) reactivation of the Camden fault (References 201 and 220). Knapp et al. (Reference 215) describe seismic reflection and gravity data that they interpret as suggesting an 80 to 100 feet offset of the base of the Coastal Plain section. Knapp et al. (Reference 215) suggest that the Tertiary Upland formation (Oligocene age) covers and is likely undeformed by the Camden fault, providing a potential upper age limit on the Cenozoic movement of the fault.

ASSOCIATED ATTACHMENTS:

None

NRC RAI Letter No. 034 Dated February 12, 2009

SRP Section: 2.5.3 – Surface Faulting

Questions from Geosciences and Geotechnical Engineering Branch 1 (RGS2)

NRC RAI Number: 02.05.03-5

FSAR Section 2.5.3.5 (pgs 2.5.3-10 and 2.5.3-11) suggests that a relationship exists between certain of the 12 faults defined in the site vicinity and regional tectonic structures, and specifically mentions the Beaver Creek and Modoc shear zones and the Cross Anchor fault. Information which bears out such a relationship for these three tectonic structures is not summarized in the FSAR, and no single figure illustrates this suggested relationship of structures in the site vicinity to regional tectonic elements. In addition, other structures in the site vicinity (e.g., the Chappells shear zone and the Gold Hill fault) parallel the northeast-trending regional structural grain of this part of the Appalachian orogen.

In order for the staff to assess the possible relationship of tectonic features occurring within the site vicinity to regional tectonic structures, please accomplish the following:

(a) Provide a figure which illustrates the suggested relationship of structures in the site vicinity to regional tectonic elements.

(b) Summarize the information used to conclude that the Beaver Creek and Modoc shear zones and the Cross Anchor fault do show a relationship with regional tectonic structures.

(c) Discuss whether or not the Chappells shear zone and the Gold Hill fault may be related to regional tectonic structures and, if they are, address the potential implications for the Summer site.

VCSNS RESPONSE:

(a) RAI Figure 02.05.03-5.1 shows the suggested relationships between structures in the site vicinity and regional tectonic elements.

(b) The Beaver Creek shear zone is located 4 kilometers to the northeast of, and along strike with, the Lowndesville shear zone. West (1998) (FSAR Reference 2.5.3-230) concludes that these may be extensions of one another, based on the following observations: (1) both shear zones deform mylonitic paragneiss, amphibolites, and paragneiss; (2) both shear zones exhibit similar foliation orientations (Lowndesville shear zone foliations strike N65 to 80°E with subvertical dips and subhorizontal stretching lineations, Beaver Creek shear zone foliations strike N80°E with

subvertical dips and shallowly plunging mineral elongation lineations); and (3) both shear zones exhibit dextral shear sense indicators.

The Cross Anchor fault is one of many faults interpreted as part of the regional Central Piedmont shear zone (West 1998) (FSAR Reference 2.5.3-230). The Cross Anchor fault connects with the Lowndesville and the Kings Mountain shear zones to define the western edge of the Charlotte Terrane.

The Modoc shear zone is considered part of the Eastern Piedmont fault system (Hatcher et al. 1977) (FSAR Reference 2.5.3-212). This fault system extends from eastern Alabama to Virginia and is mapped on the basis of linear magnetic anomalies and similarities in deformational fabrics. Figure RAI 02.05.03-5.1 shows the location of the Modoc shear zone in relation to the Eastern Piedmont fault system.

(c) The Chappells shear zone is not specifically related to any other structures in the site vicinity. The Gold Hill fault, however, is related to other features within and beyond the site vicinity. Along with the nearby and subparallel Silver Hill fault, the Gold Hill fault is part of the Gold Hill-Silver Hill shear zone, northeast of the site vicinity in North Carolina (FSAR Figure 2.5.1-211). Recent work indicates the Gold Hill-Silver Hill shear zone is not a terrane boundary (Allen et al. 2007) (Reference 1) and is not correlated with other regional tectonic structures. Neither the Chappells shear zone nor the Gold Hill fault (or Gold Hill-Silver Hill shear zone) is considered a capable tectonic structure.

References:

1. Allen, J.S., Miller, B., Hibbard, J., and Boland, I., *Significance of Intrusive Rocks Along the Charlotte-Carolina Terrane Boundary: Evidence for the Timing of Deformation in the Gold Hill Fault Zone Near Waxhaw, NC*, Geological Society of America Southeast Section Abstracts with Programs, v. 39, p. 12, 2007.

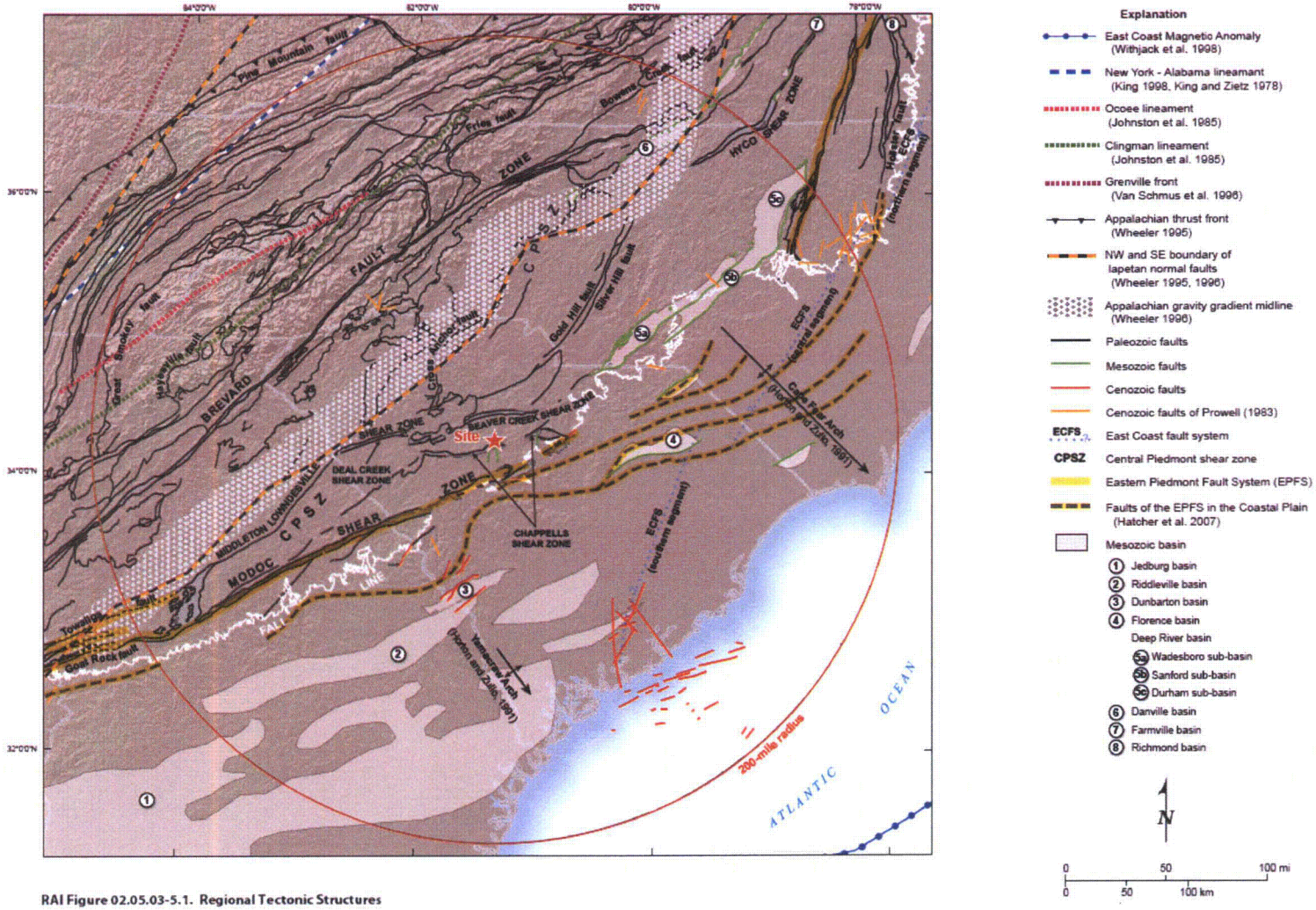
This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

No COLA changes have been identified as a result of this response.

ASSOCIATED ATTACHMENTS:

RAI Figure 02.05.03-5.1



RAI Figure 02.05.03-5.1. Regional Tectonic Structures

Explanation

- East Coast Magnetic Anomaly (Withjack et al. 1998)
- New York - Alabama lineament (King 1998, King and Zietz 1978)
- Ocoee lineament (Johnston et al. 1985)
- Clingman lineament (Johnston et al. 1985)
- Grenville front (Van Schmus et al. 1996)
- Appalachian thrust front (Wheeler 1995)
- NW and SE boundary of lapetan normal faults (Wheeler 1995, 1996)
- Appalachian gravity gradient midline (Wheeler 1996)
- Paleozoic faults
- Mesozoic faults
- Cenozoic faults
- Cenozoic faults of Prowell (1983)
- ECFS — East Coast fault system
- CPSZ — Central Piedmont shear zone
- Eastern Piedmont Fault System (EPFS)
- Faults of the EPFS in the Coastal Plain (Hatcher et al. 2007)
- Mesozoic basin
  - (1) Jedburg basin
  - (2) Riddleville basin
  - (3) Dunbarton basin
  - (4) Florence basin
  - Deep River basin
    - (5a) Wadesboro sub-basin
    - (5b) Sanford sub-basin
    - (5c) Durham sub-basin
  - (6) Danville basin
  - (7) Farmville basin
  - (8) Richmond basin

N

0 50 100 mi
0 50 100 km

NRC RAI Letter No. 034 Dated February 12, 2009

SRP Section: 2.5.3 – Surface Faulting

Questions from Geosciences and Geotechnical Engineering Branch 1 (RGS2)

NRC RAI Number: 02.05.03-6

FSAR Section 2.5.3.6 (pg 2.5.3-11) concludes that no capable tectonic sources are identified within 40 km (25 mi) of the Summer site based on review of updated geologic, seismic, and geophysical data. However, this important data (derived from published literature, interviews with experts, and field investigations) is not summarized in FSAR Section 2.5.3.6 although it bears directly on the conclusion presented in FSAR Section 2.5.3 8 that the potential for surface tectonic deformation at the site is negligible.

In order for the staff to assess the information used to conclude that no capable tectonic sources exist within 40 km (25 mi) of the Summer site and that the potential for surface tectonic deformation at the site is negligible, please summarize the pertinent data used to document these important conclusions.

VCSNS RESPONSE:

The conclusions that (1) no capable tectonic sources exist within the site area; and (2) the potential for surface tectonic deformation at the site is negligible are based on studies performed for the VCSNS Units 2 and 3 COLA. These studies include:

- Literature review and interviews with experts – A comprehensive review of published literature and interviews with experts in the geology of the site area revealed no evidence for Quaternary deformation or the potential for surface tectonic deformation in the site area.
- Aerial photograph interpretation – Assessment of stereo aerial photography of the site area and beyond revealed no evidence for Quaternary deformation or the potential for surface tectonic deformation.
- Geologic field reconnaissance, including interpretation and confirmation of existing geologic maps – Aerial and ground reconnaissance of the site area included investigations of rock outcrops and exposures, including outcrops along the Broad River and tributaries. These investigations focused on confirmation and critical analysis of existing maps, assessment of linear geomorphic features, and investigation of Quaternary alluvial deposits and surfaces. None of these activities revealed evidence for Quaternary deformation or the potential for surface tectonic deformation in the site area.

During the course of these studies, particular attention was paid to faults mapped in the site area. Various researchers map a total of twelve faults within the site vicinity, including:

- Beaver Creek shear zone;
- Chappells shear zone;
- Cross Anchor fault;
- Modoc shear zone;
- Gold Hill fault extension;
- Postulated unnamed fault near Parr;
- Wateree Creek fault;
- Summers Branch fault;
- Ridgeway fault;
- Longtown fault;
- Unnamed fault of Secor et al. (1998) (FSAR Reference 2.5.3-220) and Barker and Secor (FSAR Reference 2.5.3-202) south of the Longtown fault; and
- Unnamed fault #67 of Prowell (1983) (FSAR Reference 2.5.3-217).

FSAR Subsections 2.5.3.2 and 2.5.3.4 describe constraints on the existence and age of these features. RAI responses 02.05.01-12, 02.05.01-14, 02.05.01-15, 02.05.01-16, 02.05.01-19, 02.05.01-20, 02.05.03-1, 02.05.03-4, and 02.05.03-5 provide additional detail regarding these features. The response to RAI 02.05.03-1 includes a table summarizing evidence constraining ages for each of the twelve site vicinity faults. None of these faults are capable tectonic structures and none are associated with the potential for surface tectonic deformation.

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

No COLA changes have been identified as a result of this response.

ASSOCIATED ATTACHMENTS:

None

NRC RAI Letter No. 034 Dated February 12, 2009

SRP Section: 2.5.3 – Surface Faulting

Questions from Geosciences and Geotechnical Engineering Branch 1 (RGS2)

NRC RAI Number: 02.05.03-7

FSAR Section 2.5.3.7 (pg 2.5.3-11) concludes that there is no evidence of Quaternary deformation within the site area based on review of updated geologic, seismic, and geophysical data. However, this important data (derived from published literature, interviews with experts, and field investigations) is not summarized in FSAR Section 2.5.3.7 although it bears directly on the conclusion presented in FSAR Section 2.5.3.8 that the potential for surface tectonic deformation at the site is negligible.

In order for the staff to assess the information used to conclude that no Quaternary deformation exists within the site area and that the potential for surface tectonic deformation at the site is negligible, please summarize the pertinent data used to document these important conclusions.

VCSNS RESPONSE:

The conclusions that (1) no Quaternary deformation exists within the site area; and (2) the potential for surface tectonic deformation at the site is negligible are based on studies performed for the VCSNS Units 2 and 3 COLA. These studies include:

- Literature review and interviews with experts – A comprehensive review of published literature and interviews with experts in the geology of the site area revealed no evidence for Quaternary deformation or the potential for surface tectonic deformation in the site area.
- Aerial photograph interpretation – Assessment of stereo aerial photography of the site area and beyond revealed no evidence for Quaternary deformation or the potential for surface tectonic deformation.
- Geologic field reconnaissance, including interpretation and confirmation of existing geologic maps – Aerial and ground reconnaissance of the site area included investigations of rock outcrops and exposures, including outcrops along the Broad River and tributaries. These investigations focused on confirmation and critical analysis of existing maps, assessment of linear geomorphic features, and investigation of Quaternary alluvial deposits and surfaces. None of these activities revealed evidence for Quaternary deformation or the potential for surface tectonic deformation in the site area.

During the course of these studies, particular attention was paid to faults mapped in the site area. Various researchers postulate a total of three faults within the site area. These include the Wateree Creek fault, the postulated unnamed fault near Parr, and the

Chappells shear zone. FSAR Subsections 2.5.3.2 and 2.5.3.4 describe constraints on the existence and age of these features. RAI responses 02.05.01-14, 02.05.01-19, 02.05.03-1, and 02.05.03-4 provide additional detail regarding these features. The response to RAI 02.05.03-1 includes a table summarizing evidence constraining ages for each of the site area features. None of these three site area features is a capable tectonic structure and none is associated with the potential for surface tectonic deformation.

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

No COLA changes have been identified as a result of this response.

ASSOCIATED ATTACHMENTS:

None