Bryan J. Dolan
VP, Nuclear Plant Development

Duke Energy
EC09D/ 526 South Church Street
Charlotte, NC 28201-1006

Mailing Address:
P.O. Box 1006 – EC09D
Charlotte, NC 28201-1006

704-382-0605

bjdolan@duke-energy.com

April 14, 2009

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Duke Energy Carolinas, LLC.
William States Lee III Nuclear Station - Docket Nos. 52-018 and 52-019
AP1000 Combined License Application for the
William States Lee III Nuclear Station Units 1 and 2
Response to Request for Additional Information
(RAI No. 2002)
Ltr# WLG2009.04-04

Reference: Letter from Brian Hughes (NRC) to Peter Hastings (Duke Energy), Request for Additional Information Letter No. 065 Related to SRP 02.05.03 for the William States Lee III Units 1 and 2 Combined License Application, dated March 12, 2009

This letter provides the Duke Energy response to the Nuclear Regulatory Commission's request for additional information (RAI) included in the referenced letter.

The response to the NRC information request described in the referenced letter is addressed in a separate enclosure, which also identifies associated changes, when appropriate, that will be made in a future revision of the Final Safety Analysis Report for the Lee Nuclear Station.

If you have any questions or need any additional information, please contact Peter S. Hastings, Nuclear Plant Development Licensing Manager, at 980-373-7820.

Bryan J. Dolan
Vice President
Nuclear Plant Development

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NRO

Enclosure:

1) Duke Energy Response to Request for Additional Information Letter 065, RAI 02.05.03-010

AFFIDAVIT OF BRYAN J. DOLAN

Bryan J. Dolan, being duly sworn, states that he is Vice President, Nuclear Plant Development, Duke Energy Carolinas, LLC, that he is authorized on the part of said Company to sign and file with the U. S. Nuclear Regulatory Commission this supplement to the combined license application for the William States Lee III Nuclear Station and that all the matter and facts set forth herein are true and correct to the best of his knowledge.

Bryan J. Dolan

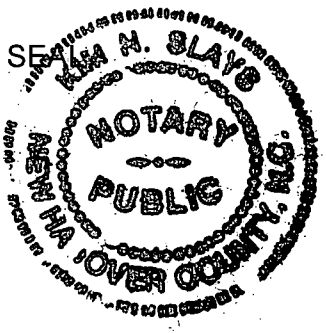
Bryan J. Dolan

Subscribed and sworn to me on April 14, 2009

Notary Public

My commission expires: April 19, 2010

SEAL



xc (w/o enclosure):

Loren Plisco, Deputy Regional Administrator, Region II
Stephanie Coffin, Branch Chief, DNRL

xc (w/ enclosure):

Brian Hughes, Senior Project Manager, DNRL

Lee Nuclear Station Response to Request for Additional Information (RAI)

RAI Letter No. 065

NRC Technical Review Branch: **Geosciences and Geotechnical Engineering Branch 2 (RGS2)**

Reference NRC RAI Number(s): **RAI 02.05.03-010**

NRC RAI:

In the response to RAI 2.5.3-5 (Question 3646), there was no discussion regarding whether the possibility of localized post-Miocene (i.e., potentially Quaternary) displacement along the Eastern Piedmont Fault System (EPFS) was indicated in the data presented by Nystrom (2006) or Howard and others (2005). Although information presented in the RAI response provided a basis for proposing a limiting Paleozoic or Mesozoic age for latest displacement along the EPFS, the interpretations related to later reactivation of this fault system as formulated by these researchers should be addressed directly.

In order for the staff to assess the potential for possible Quaternary displacement along the EPFS, please discuss in more detail the potential for localized post-Miocene (i.e., possibly Quaternary) displacement along the EPFS based on information presented by Nystrom (2006) and Howard and others (2005).

Duke Energy Response:

Howard et al. (2005) (Reference 1) mapped a complex set of brittle fabrics in the Modoc zone (Eastern Piedmont Fault System (EPFS)) exposed in the foot of the Saluda Dam. Their discussion indicates that they were able to establish relative ages for these structures based on cross cutting relationships from Paleozoic (D4 event) to Mesozoic in age. In their discussion, they also offer the conjecture of likely Cenozoic faulting. Their abstract presented no specific evidence or reasoning to support their conclusion for likely Cenozoic activity on these structures and specifically do not suggest any Quaternary activity.

Nystrom (2006) (Reference 2) discusses the occurrence of silicified cataclasites in association with localized segments of the EPFS associated with the Augusta Fault and the Davis Pond Fault. In addition, Nystrom (2006) reports approximately 30 ft of offset and 20 ft of offset, respectively, in association with these structures on the pre-Cretaceous unconformity at the Piedmont – Coastal Plain interface. At the same localities, Nystrom (2006) reports termination and effects on map patterns of overlying units as young as Miocene. Based on these observations, Nystrom (2006) concludes late Cenozoic activity at least for localized segments of the EPFS, and implies a possible correlation of the occurrence of silicified cataclasites with Cenozoic faulting.

The EPFS originally formed as a series of ductile structures associated with strike slip movement in the late Paleozoic (Hatcher et al. (2007) (Reference 3)). These features commonly show late stage brittle overprint and associated silicified cataclastic features (Hatcher et al. (1989) and Bobyarchick (1981) (References 4 and 5, respectively)). Several of the faults of the EPFS have been reactivated locally as detachments associated with formation of Mesozoic basins and their border faults (Bobyarchick (1981)) related to rifting of the Atlantic margin. This close

association with Mesozoic deformation at high structural levels is largely responsible for the cataclastic overprint on segments of the EPFS, and the occurrences of silicified cataclasites in the Piedmont have been demonstrated to be Mesozoic in age (Hatcher (2006) (Reference 6)). This is consistent with the elevated temperatures necessary for the hydrothermal activity required to produce deposition of quartz associated with the silicification (Coombs et al. (1959) (Reference 7)), and also consistent with the fact that the current surface of the Piedmont and consequently the environment of the pre-Cretaceous unconformity has been at relatively low temperature for approximately the last 100 million years (Spotila et al. (2004) (Reference 8)).

The presence of faults that offset the pre-Cretaceous unconformity and deform Coastal Plain stratigraphic sequences as young as Miocene, and younger, have long been known and reported in the geologic literature (see Cumbest et al. (2000) (Reference 9) for a recent review). These faults were extensively reported by Prowell (1988) (Reference 10) as part of his Atlantic Coast Fault Province, which extends the entire length of the U. S. Atlantic coastal margin. These faults tend to strike NNE to NE and offset the pre-Cretaceous unconformity as much as 250 ft. Some of these are closely associated with segments of the EPFS, such as the Belair Fault which is spatially associated with the Augusta Fault. Many of the faults of the Atlantic Coast Fault Province have undergone extensive investigation by both the NRC and DOE over several decades, and none of them have been found to be capable structures (see review in Cumbest et al. (2000)).

The data presented in Nystrom (2006) are consistent with the interpretation that the structures described therein are associated with localized reactivation of the EPFS by movement on faults associated with the Atlantic Coast Fault Province. Nystrom (2006) presents no information to constrain movement younger than Miocene in age. Due to the amount of investigative attention that has been focused on these Atlantic Coast Fault Province structures, and the lack to date for any evidence for Quaternary activity resulting from these investigations, it is unlikely that they and consequently the EPFS exhibit any Quaternary movement.

References:

1. Howard, C.S., Charlton, J.E., and McCarney, K.J., "New Geologic Synthesis of the Dreher Shoals and Carolina Terranes, Lake Murray and Saluda Dam, Columbia, SC," Geological Society of America Abstracts with Programs, Southeastern Section 54th annual meeting, 2005.
2. Nystrom, P.G. Jr., "Late Cretaceous-Cenozoic Brittle Faulting Beneath the Western South Carolina Coastal Plain: Reactivation of the Eastern Piedmont Fault System," Geological Society of America Abstracts with Programs, Southeastern Section 55th annual meeting, 2006.
3. Hatcher, R. D. Jr., Bream, B. R., Merschat, A. J. "Tectonic map of the southern and central Appalachians: A tale of three orogens and a complete Wilson cycle," Geological Society of America Memoir 200,p.595-632, 2007.
4. Hatcher, R. D., Jr., Thomas, W. A., Geiser, P. A., Snoke, A. W., Mosher, S., Wiltschko, D. V. "Alleghanian Orogen" in Hatcher R. D., Jr., Thomas, W. a., and Viele, G. W. eds., The Appalachian-Ouachita Orogen in the United States: Boulder, Colorado, Geological Society of America, The Geology of North America, v.F-2, p.233-318, 1989.

5. Bobyarchick, A. R., "The Eastern Piedmont Fault System and Its Relationship to Alleghanian Tectonics in the Southern Appalachians," Journal of Geology, v.89, p.335-347, 1981.
6. Hatcher, R. D, Jr., "Juxtaposed Mesozoic diabase dikes and siliceous cataclasite fault zones in the Carolinas and the mechanics of dike emplacement," Geological Society of America Abstracts with Programs, Southeastern Section 55th annual meeting, 2006.
7. Coombs, D. S., Ellis, A. J., Fyfe, W. S., Taylor, A. M., "The Zeolite facies, with comments on the interpretation of hydrothermal syntheses," Geochimica et Cosmochimica Acta, v.17, p. 53-107, 1959.
8. Spotila, J. A., Bank, G. C., Reiners, P. W., Naeser, C. W., Naeser, N. D., Henika, B. S., "Origin of the Blue Ridge escarpment along the passive margin of Eastern North America," Basin Research, v.16, p.41-63, 2004.
9. Cumbest, R. J., Wyatt, D. E., Stephenson, D. E., Maryak, M., "Comparison of Cenozoic Faulting at the Savannah River Site to fault characteristics of the Atlantic Coast Fault Province: Implications for fault capability," WSRC-TR-2000-00310, 2000.
10. Prowell, D. C., "Cretaceous and Cenozoic Tectonism the Atlantic Coastal Margin," in The Geology of North America, Vol. 1-2, The Atlantic Continental Margin, p.557-564. 1988.

Associated Revision to the Lee Nuclear Station Final Safety Analysis Report:

None

Attachments:

None