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May 24, 2012

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
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  
Partial Response to Request for Additional Information  
(RAI No. 6419)  
Ltr# WLG2012.05-04

References: Letter from Brian Hughes (NRC) to Christopher Fallon (Duke Energy),  
Request for Additional Information Letter No. 105 Concerning  
Implementation of Fukushima Near-Term Task Force Recommendations  
for the William States Lee III Units 1 and 2 Combined License Application,  
dated April 25, 2012 (ML12116A336)

This letter is Duke Energy's partial response to the Nuclear Regulatory Commission's request for additional information (RAI) included in the referenced letters. The response to RAI No. 01.05-1 is addressed in a separate enclosure. The remaining RAI Nos. 01.05- 2, 3, and 4 will be responded to within 60 days of April 25, 2012 as stipulated by the referenced NRC letter.

If you have any questions or need any additional information, please contact James R. Thornton, Nuclear Plant Development Licensing Manager (Acting), at (704) 382-2612.

Sincerely,

  
Christopher M. Fallon  
Vice President  
Nuclear Development (Acting)

DOB  
NRD

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Enclosure:

- 1) Lee Nuclear Station Partial Response to Request for Additional Information (RAI),  
Letter No. 105, RAI 01.05-1

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xc (w/out enclosure):

Frederick Brown, Deputy Regional Administrator, Region II

xc (w/ enclosure):

Brian Hughes, Senior Project Manager, DNRL

AFFIDAVIT OF CHRISTOPHER M. FALLON

Christopher M. Fallon, being duly sworn, states that he is Vice President, Nuclear Development (Acting), 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 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.

*Christopher M. Fallon*

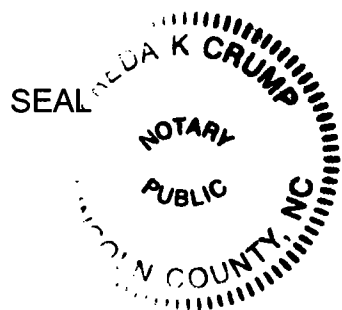
Christopher M. Fallon, Vice President  
Nuclear Development (Acting)

Subscribed and sworn to me on May 24, 2012

*Freda K. Crump*

Notary Public

My commission expires: August 17, 2016



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

**RAI Letter No. 105**

**NRC Technical Review Branch: Licensing Branch 4**

**Reference NRC RAI Number(s): RAI 01.05-1**

**NRC RAI:**

This request for additional information (RAI) specifically addresses Recommendation 2.1, of the Fukushima Near-Term Task Force recommendations contained in SECY-12-0025 as it pertains to the seismic hazard evaluation. This recommendation specifies the use of NUREG-2115, "Central and Eastern United States Seismic Source Characterization for Nuclear Facilities," (CEUS-SSC) in a site probabilistic seismic hazard analysis (PSHA). Consistent with Recommendation 2.1, as well as the need to consider the latest available information in the (PSHA) for William States Lee Unit 1 and 2 planned reactor site, the NRC staff requests that Duke Energy:

- a) Evaluate the potential impacts of the newly released CEUS-SSC model, with potential local and regional refinements as identified in the CEUS-SSC model, on the seismic hazard curves and the site-specific ground motion response spectra (GMRS) / foundation input response spectra (FIRS). For re-calculation of the PSHA, please follow either the cumulative absolute velocity (CAV) filter or minimum magnitude specifications outlined in Attachment 1 to Seismic Enclosure 1 of the March 12, 2012 letter " Request for information pursuant to Title 10 of the Code of Federal Regulations 50.54(f) regarding Recommendations 2.1, 2.3, and 9.3, of the near-term task force review of insights from the Fukushima Dai-Ichi accident." (ML12053A340).
- b) Modify the site-specific GMRS and FIRS if you determine changes are necessary given the evaluation performed in part a) above.

**Duke Energy Response:**

Reference 1 requests a response to all Fukushima-related RAIs within sixty days, or a schedule for response within thirty days. Because of the complexity of work required to evaluate impacts to the WLS site characteristics, a complete response within sixty days is not practical.

Duke Energy will evaluate the potential impacts of the newly-released NUREG-2115 CEUS-SSC model (Reference 2), with potential local and regional refinements as identified in the CEUS-SSC model, on the seismic hazard curves and the WLS site-specific ground motion response spectra (GMRS) and Unit 1 foundation input response spectra (FIRS). The GMRS is also the Unit 2 FIRS. Duke Energy will follow either the cumulative absolute velocity (CAV) filter or minimum magnitude specifications outlined in Attachment 1 to Seismic Enclosure 1 of Reference 3. Consistent with WLS FSAR Subsection 2.5.2.4.4, the EPRI 2004-2006 ground motion attenuation models will be used.

This will be one of the first applications of the CEUS-SSC model for a hard-rock site. As described below there is some uncertainty in the effect that the new CEUS-SSC model will have on the site-specific characteristic GMRS and Unit 1 FIRS. Therefore, Duke Energy proposes to defer any updates to the WLS site-specific characteristic GMRS and Unit 1 FIRS until those spectra have been developed and thoroughly evaluated, and the results and any potential implications are reported to the NRC staff. This approach is reflected in the schedule discussion below.

Section 2.5.2 of the WLS FSAR describes the current PSHA for the Lee Nuclear Station Site. WLS FSAR Figures 2.5.2-231 through 2.5.2-236 illustrates the contributions of different sources to the site seismic hazard. These figures indicate that the WLS seismic hazard is controlled by three sources – Charleston, New Madrid, and a moderate magnitude local earthquake. Evaluation of sensitivity studies described in NUREG-2115 (Reference 2) indicates that the mean hazard is not significantly affected using the revised geometries for Charleston and New Madrid sources when compared to the WLS PSHA described in FSAR Subsection 2.5.2.4. Therefore, significant changes in the WLS seismic hazard due to these two sources would not be expected. In contrast, the moderate magnitude local earthquake is interpreted differently in the CEUS-SSC model compared to the current WLS PSHA (based on the EPRI-Seismicity Owners Group model). In the current PSHA, the local earthquake source, representing seismicity in central South Carolina, had a significant influence on the predicted high-frequency response. The effect of the differing interpretations of the local earthquake cannot be reliably predicted until new CEUS-SSC calculations are actually performed.

Since any changes in the WLS seismic hazard are speculative at this point, Duke Energy only proposes a schedule to use NUREG-2115 (CEUS-SSC) to develop new evaluations of the site GMRS and Unit 1 FIRS at this time. Duke Energy assumes that the new GMRS and Unit 1 FIRS will remain less than the hard rock high frequency (HRHF) spectra described in the AP1000 DCD Subsection 2.5.2.1. The margin that is demonstrated in the current site-specific analyses (Reference 4) will be used to demonstrate that the standard design is adequate for the new site-specific demands. Should the new GMRS and Unit 1 FIRS exceed the AP1000 HRHF spectra, the scope of work required to update site-specific assessments would be different, and an alternate schedule will be required.

The AP1000 seismic design basis (Certified Seismic Design Response Spectra - CSDRS) has resulted in a very robust plant configuration. Unless the new CEUS-SSC model predicts significant increases in seismic hazard, Duke Energy is optimistic that the final site-specific assessments will conclude that the Lee site-specific seismic demands present no significant challenges to the AP1000 standard plant configuration, and that no changes to the AP1000 design criteria or hardware will be required for the WLS site.

Duke Energy will develop the WLS CEUS-SSC-based GMRS and Unit 1 FIRS (horizontal and vertical) by November 16, 2012. Duke Energy will then update NRC staff with the results and implications.

**References:**

1. Letter from Brian Hughes (NRC) to Christopher Fallon (Duke Energy), Request for Additional Information Letter No. 105 Concerning Implementation of Fukushima Near-Term Task Force Recommendations for the William States Lee III Units 1 and 2 Combined License Application, dated April 25, 2012 (ML12116A336)
2. NUREG-2115, "Central and Eastern United States Seismic Source Characterization for Nuclear Facilities," January 2012
3. Letter from Eric J. Leeds and Michael R. Johnson (NRC) to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status, dated March 12, 2012 (ML12053A340)
4. Letter from John W. Pitesa (Duke Energy) to Document Control Desk (NRC), Supplemental Partial Response to Request for Additional Information (RAI No. 6182), Ltr# WLG2012.03-04, dated March 19, 2012 (ML12080A112)

**Attachments:**

None