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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#449)
Ltr# WLG2008.10-06

Reference: Letter from Brian Hughes (NRC) to Peter Hastings (Duke Energy), *Request for Additional Information Letter No. 012 Related To SRP Section 2.3.4 for the William States Lee III Units 1 And 2 Combined License Application RAI 449*, dated September 12, 2008

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

Responses to the NRC information requests described in the referenced letter are addressed in separate enclosures, which also identify 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

D093
NRO

Enclosures:

1) Duke Energy Response to Request for Additional Information Letter 012, RAI 02.03.04-001
2) Duke Energy Response to Request for Additional Information Letter 012, RAI 02.03.04-002
3) Duke Energy Response to Request for Additional Information Letter 012, RAI 02.03.04-003

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

Subscribed and sworn to me on 10/10/2008

Notary Public

My commission expires: 9/27/2010

SEAL

xc (w/o enclosures):

Michael Johnson, Director, Office of New Reactors
Gary Holahan, Deputy Director, Office of New Reactors
David Matthews, Director, Division of New Reactor Licensing
Scott Flanders, Director, Site and Environmental Reviews
Glenn Tracy, Director, Division of Construction Inspection and Operational Programs
Charles Ader, Director, Division of Safety Systems and Risk Assessment
Michael Mayfield, Director, Division of Engineering
Luis Reyes, Regional Administrator, Region II
Loren Plisco, Deputy Regional Administrator, Region II
Thomas Bergman, Deputy Division Director, DNRL
Stephanie Coffin, Branch Chief, DNRL

xc (w/ enclosures):

Brian Hughes, Senior Project Manager, DNRL
Charles Cox, Branch Chief, RSAC

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

RAI Letter No. 012

NRC Technical Review Branch: Siting and Accident Consequences Branch (RSAC)

Reference NRC RAI Number(s): RAI 02.03.04-001

NRC RAI:

RG 1.206, Section C.I.2.3.4.2, states that a COL applicant should discuss the effects of topography and nearby bodies of water on short-term dispersion estimates. Please discuss the impact of the Broad River, McKowns Mountain, and other nearby topographical features on short-term dispersion estimates in FSAR Section 2.3.4.

Duke Energy Response:

The Lee Nuclear Station FSAR is revised to provide an enhanced discussion of the effects of topography and nearby bodies of water on the calculation of the short term atmospheric dispersion (χ/Q) values. FSAR Subsection 2.3.4.1 is revised to include a discussion of the terrain in the vicinity of the Lee Nuclear Station site including McKowns Mountain and the Broad River valley. Cross-references to FSAR Subsections which address the representativeness of the Lee Nuclear Station meteorological data and the topography within 2 miles are also provided. Additional information on this topic is provided in the Duke Energy response to Environmental Report RAI Number 49 (Ref. 1).

Reference:

1. Duke Energy Letter WLG2008.09-11, dated September 26, 2008

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

FSAR Subsection 2.3.4.1

Attachment:

1) Revised FSAR Subsection 2.3.4.1

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

Attachment 1 to RAI 02.03.04-001

Mark-up of FSAR Subsection 2.3.4.1

COLA Part 2, FSAR, Chapter 2, Subsection 2.3.4.1, second paragraph, last sentence will be revised as follows:

A straight-line trajectory is assumed between the point of release and the distances for which χ/Q values are calculated in accordance with NUREG/CR-2858 and Regulatory Guide 1.145. NUREG/CR-2858 refers to Regulatory Guide 1.111 for discussion of the effects of spatial and temporal variations in airflow in the region of a site. These effects are not described by the constant mean wind direction model. Consequently, the effects of hill and valley topography on airflow characteristics near the Lee Nuclear Station site were examined to identify any variation of atmospheric transport and diffusion conditions.

As stated in Subsection 2.3.2.6, the terrain in the immediate vicinity of the Lee Nuclear Station site can be described as gently rolling hills. The only notable terrain feature in the immediate vicinity of the site is McKowns Mountain, approximately one mile to the SSW with a peak elevation of approximately 800 feet (approximately 200 feet above the site grade elevation). Given the distance and minimal elevation rise from Lee Nuclear Station to the peak of McKowns Mountain (see Figures 2.1-204, 2.3-245, and 2.4.2-202), it can be concluded that McKowns Mountain would not have a significant effect on short term diffusion estimates.

The wind characteristics of the site were compared with the same parameters at the Greenville-Spartanburg airport (see Subsection 2.3.2.1). The representativeness of the regional climatology (within 2 miles) was also assessed (see Subsection 2.3.1). Although the Lee Nuclear Station 10 meter meteorological data shows a locally induced NW flow field at low wind speeds within the valley of the Broad River, this trend would not bias short term diffusion estimates. Therefore, no adjustments to represent non-straight line trajectories were applied.

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

RAI Letter No. 012

NRC Technical Review Branch: Siting and Accident Consequences Branch (RSAC)

Reference NRC RAI Number(s): RAI 02.03.04-002

NRC RAI:

Please provide a copy of the input files for PAVAN and ARCON96 so the staff may conduct a confirmatory analysis of the information presented in FSAR Section 2.3.4.

Duke Energy Response:

The following PAVAN input files were used to evaluate the atmospheric dispersion (χ/Q) values for a postulated accident:

lee06.in

lee06.ir2

The file lee06.in was used to calculate the accident χ/Q values reported in the FSAR for Lee Nuclear Station Units 1 and 2 using inputs from Revision 15 of the DCD. The lee06.ir2 file was used to complete a sensitivity study to evaluate the impact of changes in Revision 16 of the AP1000 DCD on the accident χ/Q values. It was concluded that the differences between Revision 15 and Revision 16 of the AP1000 DCD had a negligible impact on the results. Therefore, the χ/Q values calculated using inputs from Revision 15 of the AP1000 DCD were maintained in the FSAR.

The ARCON96 input files used to evaluate the Control Room χ/Q values for postulated accident scenarios are provided in Table 1 below. The file LEEARIN.met contains site meteorological data in ARCON96 format. Since the layout of Unit 1 is symmetrical to Unit 2, these input files are applicable to both units.

Table 1: ARCON96 Input Files

Filename	Source	Receptor
AN-CNT2C.RSF	Containment Shell	Annex Bldg Entrance
AN-CAR2.RSF	Condenser Air Removal Stack	Annex Bldg Entrance
AN-FBP2.RSF	Fuel Bldg Blowout Panel	Annex Bldg Entrance
AN-PCS2.RSF	PCS Air Diffuser	Annex Bldg Entrance
AN-PRV2.RSF	PORV/Safety Valves	Annex Bldg Entrance
AN-PV2.RSF	Plant Vent	Annex Bldg Entrance
AN-RWD2.RSF	Radwaste Bldg Rail Bay Door	Annex Bldg Entrance
AN-SV2.RSF	Steam Vent	Annex Bldg Entrance

Filename	Source	Receptor
CR-CNT1C.RSF	Containment Shell	Control Room HVAC Intake
CR-CAR1.RSF	Condenser Air Removal Stack	Control Room HVAC Intake
CR-FBP1.RSF	Fuel Bldg Blowout Panel	Control Room HVAC Intake
CR-PCS1.RSF	PCS Air Diffuser	Control Room HVAC Intake
CR-PRV1.RSF	PORV/Safety Valves	Control Room HVAC Intake
CR-PV1.RSF	Plant Vent	Control Room HVAC Intake
CR-RWD1.RSF	Radwaste Bldg Rail Bay Door	Control Room HVAC Intake
CR-SV1.RSF	Steam Vent	Control Room HVAC Intake

The attached compact disk contains the electronic PAVAN and ARCON96 input files described above.

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

None

Attachment:

1) Compact disk containing electronic versions of PAVAN and ARCON96 input files

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

RAI Letter No. 012

NRC Technical Review Branch: Siting and Accident Consequences Branch (RSAC)

Reference NRC RAI Number(s): RAI 02.03.04-003

NRC RAI:

In accordance with the NUREG-0800, Section 2.3.4, please provide a site plan drawn to scale which shows true North and potential atmospheric accident release pathways, control room intake(s), and unfiltered inleakage pathways in FSAR Section 2.3.4.

Duke Energy Response:

The Lee Nuclear Station Site Plan is found in FSAR Figure 1.1-202. The Site Plan shows the layout of the Unit 1 and 2 AP1000 structures. Westinghouse drawing APP-0000-N5-301 (Ref. 1) shows the locations of the AP1000 postulated accident sources and receptors as well as the distances between the sources and receptors. This drawing (APP-0000-N5-301) includes changes to relocate the Condenser Air Removal (CAR) Stack, the extension of the Annex Building resulting in a relocation of the Annex Building Entrance, and the extension of the Radwaste Building, resulting in a relocation of the Radwaste Building Truck Staging Area Door (formerly the Fuel Building Rail Bay Door). These changes are incorporated in DCD Revision 17. The directions with respect to true north from the receptors to each source are provided in FSAR Table 2.3-284. FSAR Table 2.3-284 will be revised as shown below. As stated in Section 1.2.2 of the FSAR, plant north at WLS is 168° clockwise from true north.

Reference:

1. Westinghouse Electric Company LLC, AP1000 Drawing, APP-0000-N5-301, "DCD Figure 15A-1 and Table 15A-7, Site Plan with Release and Intake Locations", Revision 3

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

FSAR Subsection 2.3.4.3 and FSAR Table 2.3-284

Attachment:

1) Revised FSAR Subsection 2.3.4.3 and FSAR Table 2.3-284

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

Attachment 1 to RAI 2.03.04-03

Mark-up of FSAR Subsection 2.3.4.3 and FSAR Table 2.3-284

COLA Part 2, FSAR, Chapter 2, Subsection 2.3.4.3, first paragraph, will be revised as follows:

The atmospheric dispersion estimates for the Lee Nuclear control room were calculated based on the guidance provided in ~~draft~~ Regulatory Guide 1.194. The control room χ/Qs were calculated for all probable release points to the control room ~~emergency air~~HVAC intake and the Annex Building entrance using the ARCON96 computer code (Reference 230) based on the hourly meteorological data. The ~~distances and~~ directions relative to true north from the assumed release points to the Control Room HVAC ~~I~~intake and Annex Building entrance are ~~shown~~ provided ~~e~~in Table 2.3-284. In all cases, the intervening structures between the release point and the control room intake were ignored for calculational simplicity, thereby underestimating the true distance from the release point to the control room intakes. This conservatism results in overestimating the Control Room χ/Q values.

COLA Part 2, FSAR, Table 2.3-284 will be revised as follows:

TABLE 2.3-284
LEE NUCLEAR STATION CONTROL ROOM χ/Q INPUT DATA~~HVAC INTAKE DISTANCES AND DIRECTIONS~~

Control Room HVAC Intake (El. 19.9 m) Directions

Release Point	Direction to Source (degrees)
Plant Vent	2º
PCS Air Diffuser	33º
Fuel Building Blowout Panel	~~345º~~7
~~Fuel Building Rail Bay Door~~Radwaste Building Truck Staging Area Door	~~345º~~37
Steam Vent	75º
PORV/Safety Valves	85º
Condenser Air Removal Stack	175~~15.5º~~
Containment Shell	24º

Annex Building Access (El. 1.5 m) Directions

Release Point	Direction to Source (degrees)
Plant Vent	6
PCS Air Diffuser	17
Fuel Building Blowout Panel	358
Radwaste Building Truck Staging Area Door	353
Steam Vent	21
PORV/Safety Valves	23
Condenser Air Removal Stack	57
Containment Shell	11

Notes:

~~1. Distances based on DCD Figure 15A-1 (see Figure15A-1 for release locations).~~

~~2~~1. Directions are relative to True North at the Lee Nuclear Station site.