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September 26, 2008

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
Ltr # WLG2008.09-12

Reference: Letter from Tanya Simms (NRC) to Peter Hastings (Duke Energy), *Request for Additional Information Letter No. 008 Related to SRP Section 09.02.01 for the William States Lee III Units 1 and 2 Combined License Application*, dated August 28, 2008.

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

A response to each NRC request in the referenced letter is addressed as 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

D079
NRO

Enclosure:

Duke Energy Response to Request for Additional Information Letter 008, RAI 01-02

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 September 26, 2008

Phoebe P. Eddistt

Notary Public

My commission expires: June 26, 2011

SEAL

xc (w/o enclosure):

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/enclosure):

Brian Hughes, Senior Project Manager, DNRL

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

RAI Letter No. 008

NRC Technical Review Brach: Balance of Plant Branch 1 (AP1000/EPR Projects) (SPBA)

Reference NRC RAI Number(s): 09.02.01-001

NRC RAI:

The cooling capability of the SWS mechanical draft cooling towers for the Lee units can be adversely affected by interactions that exist between the two mechanical draft cooling towers. Adverse interactions can occur due to localized atmospheric influences caused by siting considerations, the locations of major structures, the locations of the mechanical draft cooling towers, mechanical draft cooling tower fan speed, and wind effects. Because AP1000 has only one mechanical draft cooling tower in its design, interaction effects between the mechanical draft cooling towers of multi-unit sites was not evaluated by the staff for AP1000. Therefore, additional information is needed to address potential adverse interactions between the mechanical draft cooling towers for the two Lee units and the FSAR needs to be revised accordingly to reflect this additional information.

Duke Energy Response:

The SWS Cooling Tower is evaluated for potential impacts from interference and air restriction effects due to yard equipment layout and tower operation in an adjacent unit. Based on unit spacing, yard equipment layout, and the margins inherent in the performance requirements and design conditions of the towers, no adverse impacts were determined.

The Service Water System (SWS) provides cooling for the component cooling heat exchangers in support of normal plant operations. The SWS has no safety function; the SWS cooling towers and fans are identified as Equipment Class D in DCD Tier 2, Table 3.2-3; and fall under the scope of the regulatory treatment of non-safety systems (RTNSS) process.

DCD Table 16.3-2, Subsection 2.4 identifies the Investment Protection Short-Term Availability Controls for SWS as requiring both SWS cooling tower fans operable for component cooling water system cooling. This control is only applicable in Mode 5 with the RCS pressure boundary open and Mode 6 with the upper internals in place or cavity level less than full.

Adverse interactions with the potential to impact performance of the SWS cooling towers are interference between SWS cooling towers on a site with adjacent units and air restriction between a SWS cooling tower and buildings on an adjacent unit.

As defined by application of the RTNSS process, the availability controls for the SWS cooling towers are only applicable during Modes 5 and 6. This defines the scenarios for discussing the potential for interference conditions between SWS cooling towers on adjacent units. The largest plume would form during maximum heat load on the tower, which would occur during Mode 4 cooldown. Therefore, the limiting interference interaction would occur when one unit is in Mode

4 cooldown and the adjacent affected unit is operating in Mode 5 and 6 under the conditions described in the DCD Chapter 16 short-term availability controls.

Standard Plant Layout and Siting Criteria

For the standard AP1000 plant design the SWS cooling tower is located immediately adjacent to the turbine building of the associated unit. For a two-unit site, the SWS cooling towers are separated by a distance greater than 800 feet and are separated by a turbine building structure. To create a cross-unit interference condition, an SWS cooling tower plume would not only be required to travel the 800 feet separating the cooling towers, but also circumvent the large turbine building structure separating the towers of both units. The distance and obstructing buildings would provide ample opportunity to disperse the plume and minimize interference effects.

Unit separation also minimizes any effects from air restriction on a two unit site. The standard plant yard layout for a single unit locates the SWS cooling tower much closer to the associated unit's buildings than the distances separating the tower from buildings on an adjacent unit. It should be noted that air restriction conditions between a SWS cooling tower and the buildings on its own unit lies within the scope of the standard design.

Standard Plant Design Margins

The SWS cooling tower has two compartments, each capable of independent operation to provide 50% of the tower's ultimate cooling capacity. During power operation, only one compartment of the tower is required to be in service to remove heat loads, and tower maintenance is anticipated to occur when the unit is on-line. The BASES section of Table 16.3-2, Subsection 2.4 states that while both SWS cooling tower compartments are required to be available, only one compartment is required to be operating to provide the required heat removal during the identified Mode 5 and 6 conditions. Therefore, only 50% of the heat removal capacity of the SWS cooling tower is required to maintain the required tower function, thus providing a substantial margin to accommodate any potential for adverse effects on tower performance due to an interference condition.

Site Specific Meteorological and Siting Considerations

The potential for adverse impacts on SWS towers is further limited by site meteorological conditions. As discussed in the WLS FSAR 2.3.2.1.2, the prevailing wind direction on the Lee site is from the Northwest direction. The SWS cooling towers are located on an east-west axis, so the prevailing wind's south directional vector would direct a tower plume away from the adjacent unit. Should site wind conditions exist that could direct the plume along the line of sight between the SWS cooling towers, the plume would still be required to navigate the interposing turbine building that separates the towers for an interference condition to occur.

Westinghouse Technical Report TR-108 (APP-GW-GLN-108) states that the SWS cooling tower is designed to support RNS heat removal during plant shutdown at the maximum normal wet bulb temperature of 80.1°F. This value is identified as an AP1000 Site Parameter in WLS FSAR Table 2.0-201. The Table also identifies the corresponding maximum normal wet bulb temperature for the Lee Site as 76°F. The difference between the AP1000 and Lee Site wet bulb temperature represents a margin of 4.1°F, providing further assurance that interference effects, if they existed, would have a negligible effect on the SWS cooling tower performance.

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Conclusion

There is a minimal probability that an SWS cooling tower plume could travel to the vicinity of a SWS tower on an adjacent unit. Interfering structures in the path of the plume would provide ample opportunity for plume dispersion, greatly minimizing any adverse effect on tower performance. Due to the power block separation requirements for a two-unit facility, the SWS cooling tower is in much closer proximity to the buildings and structures within its own unit than to those located in an adjacent unit. Therefore, there are no site-specific conditions that could result in adverse impacts from air restriction.

During conditions where the SWS cooling tower is subject to RTNSS requirements , the tower is only operating at 50% of its operational heat load, leaving a substantial margin available to accommodate site specific adverse interactions, if they exist. Finally, the maximum normal wet bulb temperature for the site is over 4 degrees less than the wet bulb temperature used to size the tower, creating additional margin. Therefore, there is reasonable reassurance to conclude that any postulated site-specific performance degradation resulting from an interaction with a second unit would be minimal and would be readily accommodated by the design margins available to support RTNSS capability.

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

FSAR Subsection 9.2.1.2.2

Attachments:

Revised FSAR Subsection 9.2.1.2.2

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

Attachment 1 to RAI 09.02.01-001

Mark-up of FSAR Section 9.2.1.2.2

COLA Part 2, FSAR Chapter 9, Subsection 9.2:

Revise COLA Part 2, FSAR Chapter 9, Section 9.2, to add the following paragraph at the end of DCD Subsection 9.2.1.2.2, Component Description, Cooling Tower Subsection.

Cooling Tower

The SWS Cooling Tower is evaluated for potential impacts from interference and air restriction effects due to yard equipment layout and tower operation in an adjacent unit. Based on unit spacing, yard equipment layout, and the margins inherent in the performance requirements and design conditions of the towers, no adverse impacts were determined.