CHRISTOPHER M. FALLON
Vice President
Nuclear Development

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

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

704-382-9248
704-519-6173 (cell)
Christopher.Fallon@duke-energy.com

August 07, 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
Supplemental Response to Request for Additional Information
Ltr# WLG2012.08-01

References:
1. Letter from Brian C. Anderson (NRC) to Peter S. Hastings (Duke Energy), Request for Additional Information Letter No. 003, Related to SRP Section 10.04.05 (eRAI 484) for the William States Lee III Units 1 and 2 Combined License Application, dated August 11, 2008 (ML082240712)
2. Letter from Christopher M. Fallon (Duke Energy) to NRC Document Control Desk, Supplemental Response to Request for Additional Information, Ltr # WLG2012.06-10, dated June 27, 2012 (ML12188A035)

This letter provides supplemental information to Duke Energy's response (Reference 2) to the Nuclear Regulatory Commission's request for additional information (RAI 10.04.05-002) included in Reference 1.

The supplemental information for the response is addressed in Enclosure 1, which also identifies associated changes to 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 Robert H. Kitchen, Nuclear Development Licensing Director, at (919) 546-6992.

Sincerely,

Christopher M. Fallon

Christopher M. Fallon
Vice President
Nuclear Development

D093
NRO

Enclosure:

1) Lee Nuclear Station Supplemental Response to Request for Additional Information (RAI), Letter No. 003, RAI 10.04.05-002

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, 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

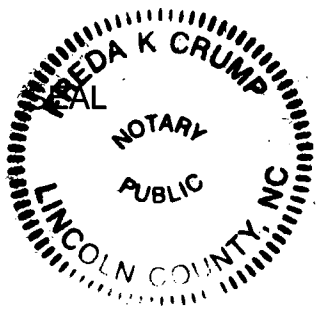
Christopher M. Fallon, Vice President
Nuclear Development

Subscribed and sworn to me on August 7, 2012

Freda K. Crump

Notary Public

My commission expires: August 17, 2016



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

RAI Letter No. 003

NRC Technical Review Branch: Balance of Plant Branch 1

Reference NRC RAI Number(s): 10.04.05-002

NRC Request for Additional Information:

10.04.05-2: In FSAR Section 10.4.5.2.2, the applicant stated that little or no water would reach the plant from a cooling tower basin wall breach due to the remote location of the tower and the grading of the site. However, the staff could not find any further details regarding the location and proximity of the mechanical draft cooling towers with respect to the plant and safety-related equipment. Regarding the circulating water system (CWS), the regulatory basis for acceptance of COL Information Item 10.4-1 (COL Action Item 10.5-3) is established in General Design Criterion (GDC 4), "Environmental and Dynamic Effects Design Bases," as it relates to design provisions to accommodate the effects of discharging water that may result from a failure of a component or piping in the CWS. In addition, Item 1.A of SRP Acceptance Criteria in SRP Section 10.4.5, "Circulating Water System," states that means should be provided to prevent or detect and control flooding of safety-related areas so that the intended safety function of a system or component will not be precluded due to leakage from the CWS.

Therefore, the staff requests additional information regarding the effects of cooling tower failure on safety-related equipment and structures of the plant. Please provide clarification and/or additional information regarding the location of the cooling towers with respect to the plant and confirm that failure of these towers will not affect the structures, systems, or components that perform or support a safety-related function.

Duke Energy Supplemental Response:

Duke Energy submitted supplemental information to the subject RAI in its letter dated June 27, 2012 (Reference 1). That submittal updated analyses associated with the effects of local intense precipitation and Make-Up Pond B (MUPB) related flooding.

This enclosure provides an update to flooding analyses associated with the Broad River. This update is required due to corrections made in analyses related to Broad River flooding.

As a result of the updated analyses, the maximum flood elevation for the Broad River (i.e., probable maximum flood with considerations of dam failures and coincident wind wave effects), is increased from 582.79 ft. msl to 585.64 ft. msl. This elevation is associated with flooding of the Broad River and the inundated Make-Up Pond A. The updated analyses include appropriate changes to related parameters, such as peak flows, Ninety-Nine Islands dam flood elevations, and wind wave effect runup slopes, which affect wave runup and setup.

The FSAR is revised in Subsection 2.4.4.1, Subsection 2.4.4.3, Table 2.4.4-201, and Table 19.58-201 (see Attachment 1). The increased flood elevation for the Broad River and associated inundated Make-Up Pond A remain below the limiting site flood elevation of 585.8 ft. msl for surface water features, as reported in the revised FSAR Subsection 2.4.1.2.2.6 (see Reference 1). Since this revised flooding level remains below the limiting site flood elevation for surface water features, the updated analyses have no impact on the conclusions or FSAR revisions presented in Reference 1.

Reference:

1. Letter from Christopher M. Fallon (Duke Energy) to NRC Document Control Desk, Supplemental Response to Request for Additional Information, Ltr # WLG2012.06-10, dated June 27, 2012 (ML12188A035)

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

1. FSAR Subsection 2.4.4.1
2. FSAR Subsection 2.4.4.3
3. FSAR Table 2.4.4-201
4. FSAR Table 19.58-201

Attachment:

1. Lee Nuclear Station Supplemental Response to Request for Additional Information, RAI 10.04.05-02, Revisions to FSAR Subsection 2.4.4.1, Subsection 2.4.4.3, Table 2.4.4-201, and Table 19.58-201

Attachment 1

Lee Nuclear Station Supplemental Response to Request for Additional Information

RAI 10.04.05-02, Revisions to FSAR

Subsection 2.4.4.1

Subsection 2.4.4.3

Table 2.4.4-201

Table 19.58-201

1. COLA Part 2, FSAR Chapter 2, Subsection 2.4.4.1 is revised under the sub-heading 'Major Upstream Structures,' the equation following the ninth paragraph to read:

   $Q_{max} = 3.091.7 * W_b * h^{1.5} + 2.481.35 * S * h^{2.5}$

2. COLA Part 2, FSAR Chapter 2, Subsection 2.4.4.1 is revised under the sub-heading 'Major Upstream Structures,' final paragraph to read:

   The multiple failures due to overtopping, coincident with the PMF, result in a peak flow of approximately 1,850,000720,000 cfs. The peak flow is determined using the HEC-HMS model discussed in Subsection 2.4.4.2.

3. COLA Part 2, FSAR Chapter 2, Subsection 2.4.4.1 is revised under the sub-heading 'Make-Up Pond C Dam,' final paragraph to read:

   The Make-Up Pond C peak dam failure outflow was combined with the maximum historical flow recorded on the Broad River at Gaffney, identified in Table 2.4.2-201, to account for any coincidental flow in the Broad River. However, the resulting combined peak outflow of 1,33607,000 cfs does not exceed the critical dam failure event for the Broad River watershed previously described. Therefore, even if routed to the Lee Nuclear Station without attenuation, the resulting water surface elevation would not exceed the elevation determined from the critical multiple dam failure scenario coincident with the Broad River watershed PMF.

4. COLA Part 2, FSAR Chapter 2, Subsection 2.4.4.3, the first two paragraphs are revised to read:

   The methods and models used to determine the resulting water surface elevation are described above in Subsection 2.4.3. Model verification and reliability is also discussed above and in Subsection 2.4.3. The HEC-RAS model, as described above, was used to model a resulting steady state flow of 1,850,0001,720,000 cfs to determine the water surface elevation at the station.

   The resulting water surface elevation at the Lee Nuclear Station is 576.503.26 ft. The maximum flood elevation is well below the station's safety-related plant elevation of 590 ft. The resulting water surface elevation of the dam failure analysis using HEC-HMS and HEC-RAS was compared with the resulting water surface elevations of the PMF analysis using HEC-HMS and HEC-RAS. The comparison is provided in Table 2.4.4-201. Given the significant freeboard remaining at the site, a full unsteady-flow analysis to determine dam breach flows and resulting water surface elevations with greater precision was determined to be unnecessary.

5. COLA Part 2, FSAR Chapter 2, Subsection 2.4.4.3 is revised under the sub-heading 'Broad River,' to read:

   Broad River

   Wind wave activity on the Broad River is evaluated coincident with the maximum water surface elevation of the PMF including the effects of dam failures as discussed above. The determined fetch length of 2.77 mi., shown in Figure 2.4.4-201, has a runup slope of 406 percent. The PMF including effects of dam failures and the coincident wind wave activity results in a flood elevation of 584.792.35 ft. msl. The Lee Nuclear Station safety-related plant elevation is 590 ft. msl and is unaffected by flood conditions and coincident wind wave activity. A more critical wind wave activity result was determined considering a fetch length through Make-Up Pond A, which becomes inundated by backwaters of the Broad River during severe flooding events. Therefore, the critical wind wave activity for the Broad River is equal to the wind wave activity for Make-Up Pond A, as discussed below.

6. COLA Part 2, FSAR Chapter 2, Subsection 2.4.4.3 is revised under the sub-heading 'Intermittent Stream/Make-Up Pond A,' last two paragraphs to read:

   Significant wave height (average height of the maximum 33-1/3 percent of waves) is estimated to be 2.76 ft., crest to trough. The maximum wave height (average height of the maximum 1 percent of waves) is estimated to be 4.59 ft., crest to trough. The corresponding wave period is 2.76 sec.

   The 4753 percent slopes along the banks of Make-Up Pond A adjacent to the site are used to determine the wave setup and runup. The maximum runup, including wave setup, is estimated to be 9.0645 ft. The maximum wind setup is estimated to be 0.08 ft. Therefore, the total wind wave activity is estimated to be 9.1453 ft. The PMF including effects of dam failures and the coincident wind wave activity results in a flood elevation of 585.642.79 ft. msl for Make-Up Pond A and the Broad River. The Lee Nuclear Station safety-related plant elevation is 590 ft. msl and is unaffected by flood conditions and coincident wind wave activity.

7. COLA Part 2, FSAR Table 2.4.4-201 is revised as follows:

TABLE 2.4.4-201
Peak Flows and Resulting Water Surface Elevations

WLS COL 2.4-2

Event	Model	Peak Flow (cfs)	Lee Nuclear Station Water Surface Elevation (ft.)	Ninety-Nine Islands Dam Water Surface Elevation (ft.)
PMF (no breach)	HEC-HMS	802,000	(a)	542.78
PMF (no breach)	HEC-RAS (unsteady state)	823,000	551.49	546.06
PMF (no breach)	HEC-RAS (steady state)	823,000	552.61	546.06
Gaston Shoals Dam failure coincident with the PMF	HEC-RAS (unsteady state)	824,000	551.52	546.09
Gaston Shoals Dam and Cherokee Falls Dam failures coincident with the PMF	HEC-RAS (unsteady state)	824,000	551.52	546.09
Major upstream structures failures coincident with the PMF(b)	HEC-HMS	~~1,720,000~~1,850,000	(a)	~~559.76~~560.10
Major upstream structures failures coincident with the PMF(b)	HEC-RAS (steady state)	~~1,720,000~~1,850,000	~~573.26~~576.50	~~561.70~~564.93

a.) Not calculated. Resulting hydrographs or peak flow used as input to the HEC-RAS model to determine the water surface elevations at the Lee Nuclear Station.

b) Upstream failures include overtopping failure of Lake Lure Dam, Tuxedo Dam, Turner Shoals Dam, Kings Mountain Reservoir Dam, Lake Whelchel, Lake Cherokee, and Make-Up Pond C. All failures occur simultaneously with a failure time near to the peak PMF outflow at Ninety-Nine Islands Dam.

8. COLA Part 2, FSAR Table 19.58-201, Sheet 4 is revised as follows:

TABLE 19.58-201 (Sheet 4 of 12)
EXTERNAL EVENT FREQUENCIES FOR WLS

Category	Event	Evaluation Criteria (See Notes)	Applicable to Site? (Y/N)[1]	Explanation of Applicability Evaluation	Event Frequency (Events/yr)
				As discussed in Subsections 2.4.1.2.2.6 and 2.4.4.3, the Probable Maximum Flood (PMF) event on the Make-Up Pond B watershed with the added effects of dam failure and coincident wind wave activity results in a flood elevation of 585.8 ft. The Lee Nuclear Station safety-related plant elevation is 590 ft. This result shows a margin exceeding 4 ft. between the calculated flood elevation and the point where safety-related SSCs could be impacted. As discussed in Subsection 2.4.4.3, the PMF event on the Broad River and inundated Make-Up Pond A, including effects of dam failures and the coincident wind wave activity, results in a flood elevation of ~~582.35~~585.64 ft. Thus, the Make-Up Pond B event described above remains the bounding event for external flooding and provides reasonable assurance that the plant has adequate protection from external flooding. As discussed in Subsection 2.4.4.1, the Make-Up Pond C peak dam failure outflow was combined with the maximum historical flow recorded on the Broad River. The resulting combined peak outflow does not exceed the critical dam failure event for the Broad River watershed, and, even if routed to the Lee Nuclear Station without attenuation, the resulting water surface elevation would not exceed the elevation determined from the critical multiple dam failure scenario coincident with the Broad River watershed PMF. Thus, the consequences of the Make-Up Pond C failure event are bounded and would not adversely affect safety related structures.	