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U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C., 20555-001

Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Station, Units 1, 2, and 3
Renewed Facility Operating License, DPR-38, DPR-47, and DPR-55
Docket Numbers 50-269, 50-270, and 50-287
Final 60-Day Response to Reference 2

References:

1. Duke Letter From Dave Baxter to NRC Document Control Desk, "Request for Extension of Duke Response Time to Referenced Letter [Reference 2]" dated May 20, 2009

2. NRC Letter From Joseph G. Giitter to Dave Baxter, "Evaluation of Duke Energy Carolinas, LLC (Duke), September 26, 2008, Response to Nuclear Regulatory Commission (NRC) Letter dated August 15, 2008, Related to External Flooding at Oconee Nuclear Station, Units 1, 2, and 3 (Oconee) (TAC Nos. MD8224, MD8225, and MD8226)," dated April 30, 2009

3. Duke Letter From Dave Baxter to NRC Document Control Desk, "Interim 30-Day Response to Reference 2," dated June 10, 2009

4. NRC Letter From Joseph G. Giitter to Dave Baxter, "Information Request Pursuant to 10 CFR 50.54(f) Related to External Flooding Including Failure of the Jocassee Dam, at Oconee Nuclear Station, Units 1, 2, and 3 (Oconee) (TAC Nos. MD8224, MD8225, and MD8226)," dated August 15, 2008

On May 11, 2009, Duke Energy Carolinas, LLC (Duke), Federal Energy Regulatory Commission (FERC) and Hydropower Consultant HDR-DTA personnel participated in a closed meeting at NRC headquarters with representatives from the Office of Nuclear Reactor Regulation (NRR) and Region II. At that meeting, Duke presented information regarding preliminary inundation studies and sensitivity analyses involving a postulated failure of the Jocassee Dam and potential flooding at Oconee.

By letter dated April 30, 2009 (Reference 2), the NRC requested that Duke provide its plan and schedule for completing the final inundation studies and sensitivity analyses within 30 days following the May 11, 2009, meeting. In addition, the letter stated that the NRC and Duke will

begin holding monthly status meetings in June 2009, to further discuss these issues. On May 20, 2009, Duke responded to the April 30, 2009, letter by committing to provide an interim response within 30 days following the May 11, 2009, meeting and a final response within 60 days following that meeting.

Duke provided the 30-day interim response via letter dated June 10, 2009 (Reference 3). Enclosed within that letter was a tentative project schedule for completing the final inundation studies and sensitivity analyses which was later discussed with NRR at a closed meeting at NRC headquarters on June 11, 2009.

The purpose of this letter is to provide the final 60-day response to Reference 2. Specifically, this letter highlights key milestones from the tentative project schedule and provides additional information regarding selected statements in the NRC letter dated April 30, 2009 (Reference 2).

Key Milestones

Duke continues to work expeditiously to respond to NRC concerns regarding the external flood potential to the Oconee site. Thus, we have developed a project milestone schedule for completing the final inundation studies and sensitivity analyses. Key deliverables from that project schedule, including their best estimate completion dates (denoted within brackets), are provided below:

- Identify key parameters for the HEC-RAS inundation analysis [end of June 2009]
- Determine variation of key parameters for the HEC-RAS inundation analysis [mid July 2009]
- Document technical justification for selection of key parameters and their variation [end of July 2009]
- Complete final analysis of west yard inundation levels [mid August 2009]
- Use output of HEC-RAS 1992 breach parameters as an input to 2D Model of west yard and issue preliminary report for Duke review [mid September 2009]
- Complete results of the 1D HEC-RAS inundation for each combination of parameters to be varied and issue for Duke review [mid September 2009]
- Develop corrective action plan for resolution of Oconee site external flood potential [end of November 2009]

Duke plans to maintain open communications with the NRC to discuss deliverables associated with the aforementioned milestones. We believe that such communications are mutually beneficial.

Additional Information Regarding Selected Statements in NRC Letter Dated April 30, 2009

Duke has identified two statements in the NRC letter dated April 30, 2009 (Reference 2) that warrant additional information. With regard to the first statement, additional information is needed to ensure a clear understanding of the design basis of the Standby Shutdown Facility (SSF). With regard to the second statement, information is needed to commence a dialog regarding revision of the Updated Final Safety Analysis Report (UFSAR) following NRC closure of this issue:

1. Reference 2 states "The plant equipment designed to provide the primary means to achieve and maintain a hot shutdown condition is not demonstrated to be protected from external flooding. Thus, the standby shutdown facility (SSF) was designed as the alternate means to provide safe shutdown during flooding scenarios."

   Response: The SSF was designed to resolve the safe shutdown requirements for fire protection (Appendix R to 10 CFR 50, Sections III.G.3 and III.L), a seismic event resulting in a circulating water pipe break which floods the Turbine Building (internal flood), and physical security concerns. Furthermore, the SSF was designed to withstand the Safe Shutdown Earthquake, waterproofed to prevent infiltration of normal ground water, and placed within the site boundary so that it would not be subject to flooding from lake waters, caused by external phenomena (external flood).

   Duke Letter to the NRC dated June 19, 1978, states, "Flood studies documented in the Oconee FSAR, Section 2.4.3 show that Lake Keowee and Jocassee are designed with adequate margins to contain and control floods so as to pose no risk to the Oconee Station site. The Safe Shutdown Facility is within the site boundary, southwest of the Unit 2 Reactor Building; therefore, it is not subject to flooding from lake waters."

   The NRC reviewed the flood protection features provided by the SSF and documented acceptance of those features in a Safety Evaluation (SE) dated April 28, 1983. The SE states, in part, ". . . the [SSF] structure meets the requirements of General Design Criteria (GDC) -2, and the guidelines of Regulatory Guide 1.102 with respect to protection against flooding."

2. Reference 2 sates, "As discussed in the NRC's August 15, 2008, letter [Reference 4], the NRC reviewed the Oconee Updated Final Safety Analysis Report (UFSAR) and noted that it does not include the effects of a Jocassee Dam failure, nor does it include the flood protection features to mitigate the consequences of such an event. Once the NRC staff has accepted the adequacy of additional information in response to the August 15, 2008, 10 CFR 50.54(f) letter, the UFSAR is required to be updated to reflect that information in accordance with 10 CFR 50.71(e)(2)(i)."

   Response: The current licensing basis for external flood hazards at Oconee Nuclear Station is addressed in several sections of the Updated Final Safety Analysis Report (UFSAR), including:

- Chapter 2.4.2.2, "Flood Design Consideration," describes flood design considerations, including records of past floods, meteorological records, and statistical procedures, which demonstrate that Lake Keowee and Jocassee are designed with adequate margins to contain and control external floods.
- Chapter 2.4.4, "Potential Dam Failures, Seismically Induced," states that the Jocassee Dam (among others) has been designed to have an adequate factor of safety under the same conditions of seismic loading as used for the design of Oconee and that its construction, maintenance and inspection is consistent with its function as a major hydro project.
- Chapter 3.1.2, "Criterion 2 -- Performance Standards (Category A)," describes the performance standards for mitigation of natural phenomena. This chapter notes that the facility should be designed to withstand additional forces that might be imposed by natural phenomena such as flooding conditions. The chapter further notes that the design basis so established shall reflect appropriate consideration of the most severe of these natural phenomena that have been recorded for the site and the surrounding area.
- Chapter 3.4.1.1, "Flood Protection Measures for Seismic Class 1 Structures," describes how flooding from a Probable Maximum Flood (PMF) event is mitigated by the ability of the Keowee dam to sustain and pass the PMF.
- Chapter 9.6.3.1, "[Standby Shutdown Facility] Structure," notes that the Keowee and Jocassee reservoirs have adequate margins to contain and control floods and that since the SSF is located within the site boundary it is not subject to flooding from lake waters.

The Oconee UFSAR does not include the effects of a Jocassee Dam failure due to non-phenomenological causes nor does it include a discussion of flood protection features required to mitigate the consequences of such an event because a Jocassee Dam failure and its consequential affects is a new safety issue. However, as noted in the NRC letter dated April 30, 2009, Oconee is required, pursuant to 10 CFR 50.71(e), to incorporate all analyses of new safety issues performed at NRC request into the UFSAR. Therefore, the analysis of this new safety issue will be included in the UFSAR.

According to the Statements of Consideration (SOC) for 10 CFR 50.71(e) dated May 9, 1980 (45 FR 30614), new analyses may be incorporated as appendices or otherwise appropriately inserted within the FSAR. Moreover, the SOC states that analyses existing in the FSAR which are known to be inaccurate or in error as a result of new analyses performed by the licensee pursuant to NRC requirements would have to be revised.

The current plan for updating the UFSAR calls for adding the analysis of this new safety issue to Chapter 2.4, "Hydrologic Engineering." The analysis will likely be added to Chapter 2.4.5 or similar chapter whose content was deleted in 1990. Other UFSAR sections will be revised as appropriate should any UFSAR-described structure, system or component require modification as a result of the analysis. Existing flood analyses,

including analyses of the Probable Maximum Flood and seismically induced dam failures are not considered inaccurate or in error as a result of the new analysis; therefore, revision to the associated sections is not planned.

Since this letter contains commercially sensitive information, Duke hereby requests the NRC withhold the letter from public disclosure pursuant to 10 CFR 2.390 (d)(1), "Public inspections, exemptions, requests for withholding."

If you have any questions on this matter, please contact Jeff Thomas, Fleet Regulatory Compliance Manager, at 864-873-2790 (Oconee) or 704-382-3438 (Charlotte).

Sincerely,

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