UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 6, 2009

Mr. Dave Baxter
Vice President, Oconee Site
Duke Energy Carolinas, LLC
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION UNITS 1, 2 and 3 - REQUEST FOR ADDITIONAL INFORMATION (RAI) REGARDING THE LICENSEE AMENDMENT REQUEST FOR UPGRADING THE LICENSING BASIS FOR TORNADO MITIGATION (TAC NOS. MD9026, MD9027, AND MD9028)

Dear Mr. Baxter:

By letter dated June 26, 2008, Duke Energy Carolinas, LLC, submitted a license amendment request (LAR) for the Oconee Nuclear Station, Units 1, 2, and 3 which proposes revisions to the current licensing basis regarding tornado mitigation. The NRC staff has reviewed the LAR and determined that additional information is required in order to complete the review. The requested additional information is enclosed. In a phone conversation with members of your staff on June 15, 2009, to provide clarification of the requested information, your staff committed to provide the requested information 60 days from the date of this letter.

If you have any questions, please call me at 301-415-1345.

Sincerely,

John Stang, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosure:
RAI

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REQUEST FOR ADDITIONAL INFORMATION (RAI)

LICENSE AMENDMENT REQUEST

TO REVISE PORTIONS OF THE

UPDATED FINAL SAFETY ANALYSIS REPORT (UFSAR) RELATED TO THE

TORNADO LICENSING BASIS

DUKE ENERGY CAROLINAS, LLC

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DOCKET NOS. 50-269, 50-270, AND 50-287

By letter dated June 26, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML081840372), Duke Energy Carolinas, LLC (the licensee, Duke), submitted a license amendment request (LAR) for the Oconee Nuclear Station, Units 1, 2, and 3 (ONS) which proposes revisions to the current licensing basis regarding tornado mitigation. The Nuclear Regulatory Commission (NRC) staff has reviewed the LAR and determined that the following additional information is required in order to complete the review. In a phone conversation with the licensee on June 15, 2009, to provide clarification of the requested information, the licensee committed to provide the requested information 60 days from the date of this letter.

RAI 1

Provide the following information for the new protected service water (PSW) transformer, switchgear, load center and the circuit breakers: 1) equipment design ratings, 2) a summary of the analyses performed to show the loading, short circuit values and the interrupting ratings, voltage drop, and protection and coordination, 3) the existing station auxiliary service water (ASW) switchgear ratings, and 4) the periodic inspection and testing requirements for electrical equipment. Provide applicable schematic and single line diagrams.

RAI 2

Provide the following information concerning the proposed PSW instrumentation and control (I&C) power and the interface with the existing plant vital I&C power: 1) design of the DC system for the PSW system including how the DC control power for the new PSW load center, switchgear and the transformer will be provided, 2) the impact on existing DC vital system including loading on the existing battery and the battery charger, 3) describe the analysis performed to determine the capacity of the batteries and the battery charger, voltage requirements at the equipment terminals, electrical protection and co-ordination, and 4) the periodic inspection and testing requirements. Provide applicable schematic and single line diagrams.

RAI 3

In Enclosure 2, Section 3.3.4 of the LAR, the licensee states that the Keowee Hydroelectric Units (KHUs) will provide power supply to the PSW switchgear through underground cables. Provide analyses to show the kilo volt ampere (kVA) loading, new circuit breaker rating, short circuit values, and voltage drop. In addition, provide information on the electrical protection and coordination, and the periodic inspection and testing requirements. Further, explain how the redundancy and independence of the Class 1E power system is maintained as a result of the proposed modification. Provide applicable schematic and single line diagrams.

RAI 4

The licensee states in the LAR that the PSW system will be fully operational from the respective unit's main control room and will be activated when existing redundant emergency systems are not available. Describe how the alarms, indications, and the electrical controls will be provided from the main control rooms of Units 1 and 2 to the proposed PSW switchgear. Explain how the controls are provided for Unit 3. Provide applicable electrical schematics and evaluations highlighting the design features.

RAI 5

Provide information on how the licensing basis for physical independence and separation criteria are met for the PSW electrical system.

RAI 6

The licensee states in the LAR that the new PSW system switchgear will receive power from the KHUs via a tornado-protected underground feeder path. Provide the following information: 1) the type of underground cable installation, i.e., direct burial or in duct banks, manholes etc., 2) how the licensee will ensure that the proposed new underground cables remain in an environment that they are qualified for, 3) periodic inspections and testing planned for cables to monitor their performance, and 4) details regarding cable size, type, maximum loading requirements, and cable protection devices.

RAI 7

Provide information concerning the design details for the new 100/13.8 kV substation, the PSW transformer and switchgear building power feeds, its protection, controls and alarms features. Provide applicable single line diagram and electrical schematics.

RAI 8

The licensee states in Enclosure 2, Figure 1 of the LAR, that two new power feeds will be installed to the auxiliary building (AB) with one power supply to the Unit 1, 2, and 3 AB equipment high pressure injection (HPI) pumps and vital I&C normal battery chargers and other power supply to the backup power to the Units 1, 2, and 3 pressurizer heaters. Provide the following information concerning this installation: 1) compare and contrast the existing power supply requirements for the above loads, 2) how the electrical separation, independence, and

redundancy requirements are maintained, 3) summary of the voltage analyses for the equipment/components affected by this modification, 4) design details for the new power feeds to AB, 5) periodic inspections and testing schedule for the these cables to monitor their performance, and 6) provide the electrical schematics and one-line drawings for these power feeds.

RAI 9

Provide confirmation that the maximum float/equalizing voltage does not exceed the equipment maximum dc voltage rating.

RAI 10

Describe in detail how the 125 vdc vital I&C primary and backup power cables and the KHU emergency start circuitry will be rerouted from the turbine building (TB) to the AB.

RAI 11

Provide the following clarifying information concerning the use of the tornado missile probabilistic methodology (TORMIS):

a) A basis for stating LAR contains an expansion of the use of the TORMIS methodology.

b) A basis for stating the NRC staff acknowledged Duke's specific application of the TORMIS methodology.

c) Provide clarification as to the LAR being based on the NRC staff having accepted the probabilistic analysis as the current licensing basis (CLB), for tornado mitigation. If this is correct please provide the documentation stating the acceptance.

RAI 12

Provide a basis for the use of the TORMIS methodology in identifying and/or excluding system structures and components (SSC) requiring or not requiring tornado protection as part of the ONS licensing basis.

RAI 13

The ONS UFSAR dated December 31, 2007, contains the following statements:
UFSAR Section 3.2.2, "System Quality Group Classification":

"In addition, there was considerable correspondence between Duke and the NRC in the years post-TMI discussing Oconee's ability to survive tornado generated missiles. Based primarily on PRA justifications, the NRC staff concluded that the secondary side heat removal function complied with the criterion for protection against tornado missiles."

UFSAR Section 10.4.7.3.6, "EFW Response Following a Tornado":

"A probabilistic risk assessment was developed to address the plant's capability to provide secondary decay heat removal via the EFW [emergency feedwater], SSF [Standby shutdown facility], ASW [auxiliary service water], and station ASW Systems, (see Section 10.4.7.3.8) in the event of a tornado. Reference 3 [ONOE-11376, changes to support multiple unit alignment to the Auxiliary Steam Header] concludes that the Standard Review Plan probabilistic criterion is met based upon the probability of failure of the EFW and station ASW Systems combined with the protection against tornado missiles afforded the SSF ASW System."

As discussed in RAI 1, the NRC staff finds no basis or additional information justifying these statements.

Provide a basis for the above cited sections of the ONS UFSAR.

RAI 14

Provide a basis for not including all unprotected SSCs in the TORMIS analysis or revise the TORMIS analysis to include all unprotected SSCs as potential targets.

RAI 15

The NRC staff needs the following information concerning Enclosure 2 of the LAR:

a) Enclosure 2, Item 3.3.4, second paragraph states the new 100/13.8 kV substation is strategically placed to reduce the probability of concurrent tornado damage to the station switchyard. Provide an explanation of what is meant by strategically placed.

b) Enclosure 2, Item 3.5 of the LAR states Duke will reconstitute the original wind analysis to ensure the tanks can withstand UFSAR Class 1 wind criteria. As required, vulnerable areas of the tanks and flow paths will be physically modified to protect against UFSAR Class 1 tornado missiles. Provide a schedule for completion of the reconstitution of the original wind analysis. Also, provide a description of all modifications made to protect the borated storage tank and flow paths.

c) Enclosure 2, Item 3.6 identified one change addressed by this LAR is: eliminating crediting the spent fuel pool, to HPI flow path for reactor coolant make-up. No mark-up of the UFSAR for this proposed change was included in the LAR. Provide a proposed mark-up of the UFSAR for this change.

d) Enclosure 2, Item 3.8 calls for analyzing a "double column set" and providing modifications. Provide a description of the analysis and the modifications.

e) Enclosure 2, Item 3.9 discusses protection of the atmospheric dump valves. Provide a description of protective measures for the atmospheric dump valves.

f) Enclosure 2, Item 3.10 calls for improving "...protection of the SSF double doors..." Provide a description of the protection and basis for the improvements.

RAI 16

Provide a description of the measures taken to protect the main steam isolation valves.

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