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10 CFR 50.90

November 21, 2011

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Station, Units 1, 2 and 3
Renewed Facility Operating Licenses Numbers DPR-38, 47 and 55;
Docket Number 50-269, 50-270 and 50-287;
Supplement to License Amendment Request for Measurement Uncertainty
Recapture Power Uprate,
License Amendment Request No. 2011-02, Supplement 1

On September 20, 2011, Duke Energy Carolinas, LLC (Duke Energy) submitted a License Amendment Request (LAR) that proposes to amend the Technical Specifications (TS) of Renewed Facility Operating License Nos. DPR-38, 47 and 55 in support of a measurement uncertainty recapture (MUR) power uprate. By letter dated November 7, 2011, the NRC requested Duke Energy submit supplemental information to enable the NRC Staff to complete the acceptance review for the LAR.

Enclosure 1 addresses Issues 1 and 3 of the NRC letter. Enclosure 2 addresses Issue 2. Duke Energy considers the information contained in Enclosure 2 to be security sensitive and requests it be withheld from public disclosure in accordance with 10 CFR 2.390.

Inquiries on this submittal should be directed to Boyd Shingleton, Oconee Regulatory Compliance Group, at (864) 873-4716.

I declare under penalty of perjury that the foregoing is true and correct. Executed on November 21, 2011.

Sincerely,


T. Preston Gillespie, Jr., Vice President,
Oconee Nuclear Station

Enclosure 2 to this letter contains security sensitive information.
Withhold From Public Disclosure Under 10 CFR 2.390.
Upon removal of Enclosure 2 this letter is uncontrolled.

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Enclosures:

Enclosure 1 **Duke Energy Response to Issues 1 and 3**
Enclosure 2 **Duke Energy Response to Issue 2**

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ENCLOSURE 1

**License Amendment Request No. 2011-02, Supplement 1
Duke Energy Response to Issues 1 and 3**

Enclosure 1
Duke Energy Response to Issues 1 and 3

NRC Issue 1

In Section 4 of the application other license amendments requests (LARs) are referenced. It is not clear in the MUR application if it is dependent on the approval of the LARs or if the application is a standalone document. In addition, in the MUR application it was not clear if the current licensing basis was used or a future licensing basis based on NRC review and approval was used. Please make clear the relationship of the MUR LAR with all other LARs currently under review by the NRC, and any future LAR applications. The NRC will not accept for review the MUR until all prerequisite LARs have been reviewed and approved by the NRC.

Duke Energy Response

The MUR application is not dependent on the approval of any of the LARs referenced in Enclosure 1, Section 4 of the MUR application. Because some the pending LARs could affect the MUR, Duke Energy found it necessary to evaluate the MUR against the current licensing basis and the future licensing basis after approval of the pending LARs and demonstrate acceptable results for both. By doing this, the timing of approval of the pending LARs or the MUR uprate LAR is not important.

There are several LARs before the NRC for review, one LAR that has received a Safety Evaluation (SE) but not yet been implemented, and one LAR that will be submitted in the near future. Four of the LARs are described on page E1-4 of Enclosure 1 to the LAR. As stated there, Duke Energy evaluated the impact of those LARs on the MUR evaluation and determined that the MUR will not impact any of those LARs with the exception of the High Energy Line Break (HELB) LAR, which is addressed in Section III of Enclosure 2 of the MUR LAR. The four LARs are listed below:

- 1) Change to Reactor Vessel Inspection Plan (LAR 2010-06)
- 2) Tornado/High Energy Line Break (LAR 2006-09/LAR 2008-05, 2008-06, & 2008-07)
- 3) Main Steam Isolation Valve (future)
- 4) NFPA-805 (already approved)

In addition to the above four LARs, there are additional LARs before the NRC. These LARs are:

- 5) 24 month fuel cycles (LAR 2010-01)
- 6) Reverse Osmosis (LAR 2010-03)
- 7) Technical Specification Task Force (TSTF) 490 (Dose Equivalent Iodine)
- 8) TSTF 448 (Control Room Habitability) (LAR 2010-07)

All eight of the LARs are discussed in more detail below.

1) Change to Reactor Vessel Inspection Plan

This is addressed in the response to NRC Issue #3 below

2) Tornado/High Energy Line Break

Both of these analyses are discussed in the MUR LAR in terms of current licensing basis and future licensing basis. Since the NRC is still reviewing the Tornado/HELB LARs, and no definitive approval date has been communicated, Duke Energy evaluated both the Tornado and the HELB analyses considering the current licensing basis and the future licensing basis (after approval of the LARs).

Current Licensing Basis:

The impact of the MUR uprate is addressed for the current licensing basis under the assumption the Tornado and HELB LARs will not be approved when the MUR uprate is implemented. Tornado is addressed as part of the evaluation of Natural Phenomena, Section II, Item 31, pg. E2-27 of Enclosure 2 to the MUR LAR while HELB is addressed as part of the HELB evaluation in Section III, Item 1, pg. E2-40. The conclusion for Tornado is the current analysis bounds the MUR uprate. The current licensing basis for HELBs is not bounding for the MUR uprate, but the analysis demonstrating an operable but degraded/non-conforming (OBDN) condition is. The OBDN condition will be cleared once the PSW modification is implemented as part of the requirement in the SE for the NFPA-805 LAR.

Future Licensing Basis:

The impact of the MUR uprate is also addressed for the future licensing basis assuming the MUR uprate is implemented after the Tornado and HELB LARs are approved. The future tornado analysis is described as part of the evaluation of Natural Phenomena, Section II, Item 31, pg. E2-27. The future HELB analyses are described as part of the HELB evaluation in Section III, Item 1, pg. E2-41. The analyses submitted in the Tornado and HELB LARs are performed at a power level that bounds the MUR uprate. The HELB analyses submitted in the HELB LARs are all performed at a power level that bounds the MUR uprate with the exception of the DNB analysis for the double main steam line break. Subsequent to the submittal of the last HELB LAR (Unit 3), the double steam line break DNB analysis was revised to incorporate the MUR uprate conditions and the DNB results were verified acceptable. Therefore, the MUR uprate will not invalidate the conclusions documented in the Tornado and HELB LARs and the future licensing basis analyses will be acceptable for the higher MUR uprate power level.

3) Main Steam Isolation Valve

The Main Steam Isolation Valve (MSIV) modification is still in the process of being designed. The MSIV LAR is currently scheduled to be submitted during fall 2012. The thermal hydraulic analyses that support the design will be performed at the uprated power level plus uncertainty. In addition, the analyses described in the MUR LAR that model the conceptual design of MSIVs (discussed below) will be evaluated to ensure the assumptions used in the previously submitted analyses are bounded by the actual design.

The MUR LAR discusses the role of the MSIVs in several locations in Enclosure 2. On page E2-24, Duke Energy acknowledges that ONS is currently operable but degraded/non-conforming (OBDN) condition for the Appendix R fire until either MSIVs are installed or transition to NFPA-805 fire analysis occurs.

As noted above in the Tornado/HELB LAR discussion, the Tornado discussion is delineated into Current Licensing Basis and Future Licensing Basis on pages E2-27 & 28. The tornado, wind, and hurricane analysis establishes design criteria for Structures, Systems, and Components (SSCs).

Current Licensing Basis (tornado, wind, and hurricane):

There is no design analysis or any mitigation calculation on the docket. A design objective stated in UFSAR is to have capability to safely shutdown all three units.

There is currently a thermal-hydraulic analysis performed at a power level that bounds the MUR uprate power level to demonstrate steam generator tube integrity is maintained. The results therefore remain acceptable following the MUR uprate.

Since MSIVs are not installed at Oconee yet, the current licensing basis is unaffected if the Tornado LAR has not been approved. The MSIV LAR will only impact the future licensing basis.

Future Licensing Basis (tornado, wind, and hurricane):

The future licensing basis thermal hydraulic analysis assumes the tornado damages the turbine building and both main steam lines downstream of the location of the proposed MSIVs. It also assumes the 4160V switchgear (which supplies power to the High Pressure Injection (HPI) pumps, Main Feedwater (MFW) pumps, and motor driven Emergency Feedwater (EFW) pumps) is lost. The MSIVs bottle both generators up and keep secondary pressures and temperatures elevated. The Standby Shutdown Facility (SSF) is credited with providing Auxiliary Service Water (ASW) for decay heat removal and for supplying reactor coolant makeup via the SSF reactor coolant (RC) makeup pump. The analysis submitted in Duke Energy letter dated June 24, 2010 (Reference II.37 of Enclosure 2 to the MUR LAR) related to tornado mitigation was also submitted as part of the HELB LAR and was initiated from 102% of 2568 MWt. The event was analyzed to ensure the SSF could maintain the plant in Mode 3 with $T_{ave} \geq 525$ °F without interruption of single phase natural circulation. Since the analysis was initiated from a power level that bounds the MUR power uprate and natural circulation was successfully demonstrated, the results are acceptable for an MUR power uprate.

As noted above in the Tornado/HELB LAR discussion, the HELB discussion is delineated into Current Licensing Basis and Future Licensing Basis on pages E2-40 and 41.

Current Licensing Basis (HELB):

The current licensing basis is not bounding for the MUR uprate. However, the limiting HELB event is considered OBDN. It is non-conforming because the licensed operator action time to restore core cooling cannot be achieved in the required time frame. It is operable because an analysis was performed at a power level that bounds the MUR uprate to demonstrate the acceptance criterion was satisfied.

Since MSIVs are not installed at Oconee yet, the current OBDN condition is unaffected. The MSIV LAR will only impact the future licensing basis.

Future Licensing Basis (HELB):

Duke Energy describes the proposed HELB licensing basis to resolve the OBDN condition for the current HELB licensing basis. In the discussion of the reconstituted licensing basis, Duke Energy states that three revised HELB analyses (main steam line break, feedwater line break, and letdown line break) were prepared and submitted to the NRC in the HELB LARs (References II.38, II.39 and II.40 of Enclosure 2 to the MUR Uprate LAR). These analyses take credit for the proposed Protected Service Water (PSW) System and the SSF to achieve a safe shutdown condition following certain HELBs postulated throughout the plant. Additionally, proposed MSIVs are necessary to achieve safe shutdown following certain MSLB when using the SSF for event mitigation. These analyses will be the future licensing basis once the NRC SER is received and the PSW system is installed (tentatively scheduled for middle of 2012) and the MSIVs are installed. The MSIVs are currently scheduled to be installed on ONS Units 1, 2 and 3 in 2014, 2015, & 2016, respectively. The limiting MSLB DNBR analysis submitted via Reference II.38 is a steam line break with coincident LOOP initiated from 2568 MWt. It does not credit MSIV closure to limit the primary system depressurization. Following the submittal of Reference II.40, the MSLB analysis was revised to initiate from 2619 MWt (102% of 2568 MWt). The conclusion in Reference II.40 that DNBR remains within acceptable limits remains valid for the analysis initiated from 2619 MWt. Since the analysis was performed at power level that bounds the MUR power uprate, the DNBR results are acceptable for the MUR power uprate.

4) NFPA-805

Approval to transition to a NFPA-805 based fire analysis was granted (Reference II.34 of Enclosure 2 to the MUR Uprate LAR) with the requirement that several conditions had to be met. One of those conditions was installation of the Protected Service Water System (PSW). The analyses performed in support of the NFPA-805 transition crediting PSW were performed at a power level that bounds the MUR uprate. The MUR LAR will not invalidate the SE received for NFPA-805 transition.

5) 24 Month Fuel Cycles

The 24 month fuel cycle LAR (Duke Energy Letter dated May 6, 2010) has not yet been approved by the NRC. There are several impacts on the Technical Specification surveillance frequencies and on instrumentation drift as described in the 24 month fuel cycle LAR. Instrumentation drift affects the uncertainty calculations used in the safety analyses. The MUR uprate also affects some of the uncertainties assumed in the safety analyses as described on pages E2-26 and 27 of the MUR LAR. However, all of the analyses described in Section II and III of Enclosure 2 of the MUR LAR have been performed with uncertainties that account for or bound both the 24 month fuel cycles and the MUR uprate. Although not explicitly described in the 24 month fuel cycle LAR or the MUR LAR, increased cycle length and reactor power also increases end of cycle decay heat. While decay heat is not a licensing condition, it is an input to the safety analyses. Again, all of the analyses described in Section II and III of the Enclosure 2 of the MUR

LAR have been performed with decay heat values that bound the combined effect of 24 month fuel cycles and the MUR uprate.

The 24 month fuel cycles LAR did not address the impact on reactor vessel fluence since it was not part of the LAR template expected by the NRC for 24 month fuel cycles. The MUR LAR did address the impact of the uprate on fluence, but did not consider 24 month fuel cycles. It is expected that the combined impact will be minimal since fresh fuel is not being placed on the periphery as a result of either 24 month fuel cycles or the MUR uprate. Nevertheless, the combined effect of 24 month fuel cycles and the MUR uprate on fluence will be evaluated prior to operating in this condition.

Other than surveillance frequencies, no licensing limits were affected due to 24 month fuel cycles. The limit changes associated with the MUR uprate have been analyzed with consideration of the aforementioned affects of 24 month fuel cycles. Therefore, approval of the 24 month fuel cycle LAR will not invalidate any information supplied in the MUR uprate LAR and the MUR uprate LAR will not invalidate the conclusions of the 24 month fuel cycle LAR.

6) Reverse Osmosis

The Reverse Osmosis (RO) LAR is not a prerequisite for the MUR uprate LAR. The MUR uprate LAR does not impact the RO LAR.

7) TSTF 490 (Dose Equivalent Iodine)

TSTF 490 LAR is not a prerequisite for the MUR uprate LAR. The MUR uprate LAR does not impact the TSTF 490 LAR.

8) TSTF 448 (Control Room Habitability)

TSTF 448 LAR is not a prerequisite for the MUR uprate LAR. The MUR uprate LAR does not impact the TSTF 448 LAR. (Note: This LAR was submitted on October 13, 2011, subsequent to the MUR power uprate LAR.)

NRC Issue 3

In the MUR power uprate application it stated the impact of the Oconee 1, 2, and 3 reactor internals inspection plan had been evaluated. The assessment addressed the impact of MUR uprate on aging degradation in reactor internals. The application referenced MRP-227-Revision 0, "Pressurized Water Reactor Internals Inspection and Evaluation Guidelines," which provides generic inspection and evaluation guidelines based on a broad set of assumptions about plant operation. The Oconee 1, 2, and 3 reactor internals inspection plan (ANP-2951, Revision 1) was developed in accordance with the generic requirements in MRP-227, Revision 0. By letter dated November 8, 2010 (ADAMS Accession No. ML103140599), the licensee submitted a LAR requesting NRC review and approval of the of the reactor vessel internals inspection program. The inspection plan referenced MRP-227-Revision 0. However, by letter dated September 1, 2011 (ADAMS Accession No. ML11251A160), the licensee stated that the November 8, 2010, LAR would be updated to

incorporate changes associated with NRC staff review and approval of MRP-227 Revision 0. As indicated above, please review the MUR power uprate application to assure that the LAR associated with the approval of the reactor vessel internals inspection plan is not a prerequisite LAR for the MUR power uprate. In addition, please verify that any changes that will be made to the November 8, 2010 LAR will not have any effect on the MUR power uprate.

Duke Energy Response

Duke Energy assessed the impact of the proposed MUR power uprate on the Oconee reactor internals inspection plan in Section IV.1.A.ii of Enclosure 2 to the MUR LAR (page E2-44 and E2-45) and concluded the plan will not be affected. The LAR associated with the approval of the reactor vessel internals inspection plan is not a prerequisite LAR for the MUR power uprate. Changes made to the November 8, 2010 LAR, as a result of updating the Oconee inspection plan to incorporate changes associated with NRC staff review and approval of MRP-227 Revision 0 (after approval will be MRP-227-A), are not expected to affect the MUR power uprate. Should there be any effect on the MUR power uprate, it will be identified when preparing the revision to the November 8, 2010, LAR and addressed by the appropriate process.