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10 CFR 50.90

U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTENTION: Document Control Desk

Subject: Duke Energy Carolinas, LLC (Duke Energy)
McGuire Nuclear Station, Units 1 and 2
Docket Nos. 50-369 and 50-370

Response to Request for Additional Information Regarding License Amendment Related to Measurement Uncertainty Recapture Power Uprate (TAC Nos. ME8213 and ME8214)

This letter provides the responses to a June 15, 2012 Nuclear Regulatory Commission (NRC) request for additional information (RAI) related to a March 5, 2012 McGuire Nuclear Station (MNS) Units 1 and 2 License Amendment Request (LAR) submitted pursuant to 10 CFR 50.90 in support of a measurement uncertainty recapture (MUR) power uprate.

NRC MUR LAR RAI questions 32 through 40 and Duke Energy's response are provided in Enclosures 1, 2, and 3. Responses to MNS MUR LAR RAI questions 1 through 3 and questions 5 through 19 were provided to the NRC via correspondence dated May 29, 2012 and June 21, 2012 respectively. Responses to MNS MUR LAR RAI question 4 and questions 20 through 31 were provided to the NRC via correspondence dated July 6, 2012.

Enclosures 2 and 3 contain sensitive information. Duke Energy requests that Enclosures 2 and 3 be withheld from public disclosure per 10 CFR 2.390(d)(1). Upon removal of Enclosures 2 and 3, this letter is uncontrolled.

The conclusions reached in the original determination that this LAR contains No Significant Hazards Considerations and the basis for the categorical exclusion from performing an Environmental/Impact Statement have not changed as a result of the RAI responses provided in this submittal.

Please contact Kenneth L. Ashe at 980-875-4535 if additional questions arise regarding this LAR.

A001
NRR

Sincerely,

R. T. Repko

Enclosures
cc: w/enclosures

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OATH AND AFFIRMATION

Regis T. Repko affirms that he is the person who subscribed his name to the foregoing statement, and that all the matters and facts set forth herein are true and correct to the best of his knowledge.

Regis T. Repko, Vice-President, McGuire Nuclear Station

Subscribed and sworn to me: July 16, 2012

Date

Notary Public

My commission expires: July 1, 2017

Date

Enclosure 1

McGuire Nuclear Station's Responses to MUR LAR RAI Questions 32 through 40 In The June 15, 2012 NRC Request for Additional Information

NRC Question 32

Provide details of the load increases at various voltage levels of the Alternating Current (AC) distribution system (13.8 kiloVolt (kV) and 6.9 kV normal auxiliary system, 4.16 kV essential auxiliary system, and 600 volt (V) normal and essential systems) due to the Measurement Uncertainty Recapture (MUR) power uprate and High Pressure (HP) turbine replacement.

McGuire Response to NRC Question 32

As discussed in Section V.1 of the LAR, the McGuire AC electrical systems were reviewed and found to have adequate capacity at MUR uprate conditions and are bounded by existing analyses and calculations. The following are the expected AC electrical load increases due to the MUR uprate and HP turbine replacement project as determined during evaluations of McGuire systems:

Load	System Voltage	Rated Horsepower	Pre-MUR Brake Horsepower	Post-MUR Brake Horsepower	Percent Change
Condensate Pumps	6.9kV	1500	1289	1304	1.2
Condensate Booster Pumps	6.9kV	3000	2305	2329	1.1
Feedwater Heater C Drain Pumps	6.9kV	1250	1133	1134	0.1
Feedwater Heater G Drain Pumps	600V	250	190.6	191.0	0.2

Since (a) the expected load changes are quite small, (b) post-MUR pump Brake Horsepowers are well below the rated motor nameplate HPs and (c) margins well beyond the

expected load increases are available in the current AC electrical power analyses, the load changes were deemed bound by the existing analyses.

NRC Question 33

Provide a list and brief discussion of the electrical analysis and calculations which the licensee reviewed or updated to determine that the AC distribution system(s) remain bounded by the existing analysis and calculations of record.

McGuire Response to NRC Question 33

The electrical calculations of record that were reviewed to determine the impact of MUR on AC distribution system(s) are listed in the following table. This review determined that the AC distribution system(s) remain bounded by the existing analysis and calculations of record.

Number	Title	Description
MCC-1381.05-00-0199	Station Blackout Coping Study	This calculation documents the ability of installed equipment to cope with a Station Blackout (SBO) within the guidelines of NUMARC 87-00, Revision 1.
MCC-1381.05-00-0257	U1/2 AC Auxiliary Power System ETAP Model Base File	This calculation documents the AC Auxiliary Power System component design input data (including modeled loads) that is subsequently used for AC system ETAP (output) calculations.
MCC-1381.05-00-0258	Unit 1, 6.9kv, 4.16kv, and 600 volt Auxiliary Power System Safety Related Voltage Analysis	This (output) calculation documents ETAP load flow / voltage drop analyses of the Unit 1 AC Auxiliary Power Systems.
MCC-1381.05-00-0263	Unit 2, 6.9kv, 4.16kv, and 600 volt Auxiliary Power System Safety Related Voltage Analysis	This (output) calculation documents ETAP load flow / voltage drop analyses of the Unit 2 AC Auxiliary Power Systems.

Number	Title	Description
MCC-1381.05-00-0260	U1, 4.16kV Essential Auxiliary Power System (EPC) Diesel-Generator Dynamic Loading Analysis, Using ETAP	This calculation documents the dynamic loading (and voltage drop) of the Unit 1 Emergency Diesel Generators (EDGs) and associated Essential Power Systems.
MCC-1381.05-00-0266	U2, 4.16 KV Essential Auxiliary Power System (EPC) Diesel Generator Dynamic Loading Analysis, Using ETAP	This calculation documents the dynamic loading (and voltage drop) of the Unit 2 EDGs and associated Essential Power Systems.
MCC-1381.05-00-0265	U2 6.9kV, 4.16kV & 600V Auxiliary Power Systems Short Circuit Analysis	This (output) calculation documents ETAP short circuit analyses of the Unit 2 AC Auxiliary Power Systems.
MCC-1381.05-00-0301	U1 6.9kV, 4.16kV & 600V Auxiliary Power Systems Short Circuit Analysis	This (output) calculation documents ETAP short circuit analyses of the Unit 1 AC Auxiliary Power Systems.
MCC-1381.06-00-0007	U1/2, 24kV Unit Main Power System (EPA) Generator Circuit Breaker Short Circuit Analysis	This calculation documents the 3-phase fault currents through the Unit 1 and Unit 2 24kV generator circuit breakers, step-up transformers and associated components.
MCC-1381.06-00-0008	Design Calculations for Determining Short Circuit Capabilities of Isolated Phase Buses	This calculation documents the 3-phase fault currents at various Isolated Phase Bus (IPB) locations.
MCC-1381.06-00-0019	Protective Relay Setting Calculation for Units 1 & 2 Generators, 24kV IPB and Transformers	This calculation determines the settings for devices protecting Main Power System equipment (e.g. Main Generators, 24KV IPB, Main Step Up and Unit Auxiliary Transformers).
MCC-1381.06-00-0054	U1/2, SSF Diesel-Generator (D/G) Loading Analysis	This calculation determines the maximum steady-state load expected for the Safe Shutdown Facility (SSF) D/G.

Number	Title	Description
MCC-1381.06-00-0067	Main Generator Voltage Regulator Limiters and Protection Setting Calculation	This calculation documents the basis for the Unit 1 and Unit 2 main generator voltage regulator limiter and protection settings.
MCC-1381.06-00-0073	Unit 1 Main Generator Relay Settings for the SEL-300G and Beckwith 3425 Relays	This calculation documents the settings for the Unit 1 main generator microprocessor-based protective relays.
MCC-1381.06-00-0076	Unit 2 Main Generator Relay Settings for the SEL-300G and Beckwith 3425 Relays	This calculation documents the settings for the Unit 2 main generator microprocessor-based protective relays.

NRC Question 34

Provide a discussion regarding any impact on generator protective relaying due to the increase in the main generator rating.

McGuire Response to NRC Question 34

The MUR alone has no impact on generator protective relaying. However, the main generator stator replacement project will have an impact on the settings of the generator protective relays since the current settings are based upon the current generator rating of 1330 MVA (Unit 1) and 1380 MVA (Unit 2) versus the increased rating of 1450 MVA for both Units following generator stator replacement. The new settings for the generator protective relaying have been determined and incorporated into approved calculations.

NRC Question 35

Provide a discussion of power source(s) for the new Cameron CheckPlus leading edge flow meter.

McGuire Response to NRC Question 35

The power for the Leading Edge Flow Meter (LEFM) equipment will be supplied by battery backed, non-vital, 120VAC sources 1KDCS1 for Unit 1 and 2KDCS1 for Unit 2. Primary power for the MODBUS servers will be supplied by battery backed, non-vital, 120VAC sources 1KU for Unit 1 and 2KU for Unit 2. Backup power to the Unit 1 and Unit 2 MODBUS equipment will be

supplied by 1KDCS1 for Unit 1 and 2KDCS1 for Unit 2. These power sources have sufficient margin to accommodate the power load associated with the new Cameron CheckPlus leading edge flow meter.

NRC Question 36

Provide a copy of the current One Line Diagrams of 250 V Direct Current (DC) Auxiliary Power System, 125 V DC and 240/120 V AC Auxiliary Control Power System, and safety-related 125 V DC and 120 V Vital Instrument and Control Power System.

McGuire Response to NRC Question 36

Reference Enclosure 2 for copies of the current One Line Diagrams of the site 250 VDC Auxiliary Power System, 125 VDC and 240/120 VAC Auxiliary Control Power System, and safety-related 125 VDC and 120 V Vital Instrument and Control Power System.

NRC Question 37

Provide details of any load increases on the 250 V DC Auxiliary Power System, 125 V DC and Power System, and safety-related 125 V DC and 120 V Vital Instrument and Control Power System due to the MUR power uprate and HP turbine replacement.

McGuire Response to NRC Question 37

Existing margin in plant electrical systems can accommodate the power load associated with the new Cameron CheckPlus LEFM (refer to the response to RAI Question 35). No other load changes are identified for the 250 V DC Auxiliary Power System, 125 V DC and Power System, and safety-related 125 V DC and 120 V Vital Instrument and Control Power System due to the MUR uprate and HP turbine replacement project.

NRC Question 38

Provide a list and brief discussion of the electrical analysis and calculations which the licensee reviewed or updated to determine that the DC distribution system(s) [including 240/120 V AC Auxiliary Control and 120 V Vital Instrument and Control Power Systems] remain bounded by the existing analysis and calculations of record.

McGuire Response to NRC Question 38

The electrical calculations of record that were reviewed to determine the impact of MUR on DC distribution system(s) [including 240/120 V AC Auxiliary Control and 120 V Vital Instrument and Control Power Systems] are listed in the following table. This review determined that these systems remain bounded by the existing analysis and calculations of record.

Number	Title	Description
MCC-1381.05-00-0195	U1/2, Essential Diesel Generator (D/G) 125VDC Auxiliary Power System (EPQ) Battery and Charger Sizing	This (output) calculation verifies that the existing EDG 125 VDC batteries and chargers are adequately sized for the expected load profile.
MCC-1381.05-00-0222	U1/2, 125VDC Essential Diesel-Generator (D/G) Auxiliary Power System (EPQ) Voltage Drop & Short Circuit Analysis	This (output) calculation documents Unit 1 and Unit 2 EDG 125 VDC System load flow / voltage drop and short circuit analyses.
MCC-1381.05-00-0267	U1/2, 125VDC Diesel-Generator (D/G) Auxiliary Power System (EPQ) ETAP Model Base File	This calculation documents the EDG DC Auxiliary Power System component design input data (including modeled loads) that is subsequently used for system (output) calculations.
MCC-1381.05-00-0200	U1/2 125VDC Vital I&C Power System (EPL) Battery Sizing and Battery Charger Sizing	This (output) calculation verifies that the existing 125 VDC Vital I & C System batteries and chargers are adequately sized for the expected load profile.
MCC-1381.05-00-0230	U1/2, 125VDC Vital I&C Power System (EPL) Voltage Drop Analysis	This (output) calculation documents Unit 1 and Unit 2 125 VDC Vital I & C System load flow / voltage drop analyses.

Number	Title	Description
MCC-1381.06-00-0013	U1/2, 240/120VAC Auxiliary Control Power System (EPF), Inverter & Regulator Sizing	This (output) calculation verifies that Unit 1 and Unit 2 125 VDC Control and 240/120 VAC System batteries, chargers, inverters and regulators are adequately sized.
MCC-1381.06-00-0062	U1/2, 125VDC Auxiliary Control Power System (EPK) Battery and Charger Sizing	This (output) calculation verifies that Unit 1 and Unit 2 125 VDC Control System batteries are adequately sized.
MCC-1381.06-00-0025	U1/2, 250VDC Auxiliary Power System (EPJ) Battery and Charger Sizing	This (output) calculation verifies that Unit 1 and Unit 2 250 VDC Power System batteries and chargers are adequately sized.
MCC-1381.06-00-0027	250/125VDC SSF Auxiliary Power Battery and Battery Charger Sizing Calculation	This (output) calculation verifies that SSF 250/125 VDC Power System batteries and chargers are adequately sized.
MCC-1381.06-00-0056	125VDC Switchyard Battery and Battery Charger Sizing Calculation	This (output) calculation verifies that switchyard 125 VDC Power System batteries and chargers are adequately sized.
MCC-1381.06-00-0061	SSF Diesel Generator 24VDC Starting Battery Sizing Calculation	This (output) calculation verifies that SSF DG 24 VDC Power System batteries and chargers are adequately sized.

NRC Question 39

Provide One Line Diagrams of 230 kV and 525 kV switchyards to which MNS Unit 1 and Unit 2 are connected. Provide a discussion of any impact on 230 kV and 525 kV switchyard components due to the increase of 40 MWe power output from each unit of MNS.

McGuire Response to NRC Question 39

Reference Enclosure 3 for copies of the One Line Diagrams of the 230 kV and 525 kV switchyards to which McGuire Nuclear Station (MNS) Unit 1 and Unit 2 are connected.

The MUR, along with the HP Turbine project and generator replacement project, will collectively result in an increase of approximately 40 MWe from each Unit at MNS. This will return the gross MNS generation capability to the current generator's maximum design output of 1450 MVA. Associated switchyard components were originally designed to accommodate the main power step-up transformer ratings (Unit 1 - 1520 MVA, 230kV; Unit 2 - 1500 MVA, 525kV), which exceed the replacement generator's design rating of 1450 MVA. Therefore, the 230 kV and 525 kV switchyard components can accommodate the increased 40 MWe power output from each MNS unit.

NRC Question 40

Provide minimum 230 KV and 500 kV switchyard voltages agreed upon between the MNS and the Transmission System Operator (TSO) for N-1 (generator trip) conditions for the pre-MUR and post-MUR operating conditions. Discuss whether these minimum switchyard voltages have been considered to calculate the degraded voltage relay settings (as provided in the MNS Technical Specifications Surveillance Requirement SR 3.3.5.2) at the safety-related buses. Discuss any impact of the post-MUR uprate conditions on the degraded voltage relay settings.

McGuire Response to NRC Question 40

The minimum pre-MUR Unit 1 230 kV switchyard voltages are 224.77 kV (both offsite circuits available) and 235.25 kV (one offsite circuit out of service). The minimum pre-MUR Unit 2 525 kV switchyard voltages are 503.37 kV (both offsite circuits available) and 525.63 kV (one offsite circuit out of service).

The MNS switchyard voltages are set based upon the degraded voltage relay settings at the safety-related buses (as specified in Technical Specifications Surveillance Requirement SR 3.3.5.2.) and plant loading. The degraded voltage relay settings at the safety related buses will not be changed under post-MUR uprate conditions. Therefore, any changes in switchyard voltages after MUR implementation will be dependent on plant loading. Any change in these post-MUR switchyard voltages will be discussed and communicated with the TSO prior to implementation of the MUR.