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U.S. Nuclear Regulatory Commission
Washington, DC 20555

Duke Energy Carolinas, LLC (Duke Energy)
McGuire Nuclear Station (MNS), Units 1 and 2
Docket Numbers 50-369, 50-370
Renewed License Numbers NPF-9 and NPF-17

Subject: Response to August 18, 2015, NRC Request for Additional Information Regarding License Amendment Request to Implement a Risk-Informed Performance-Based Fire Protection Program (TAC Nos. MF2934 and MF2935).

References:

1. MNS Letter, License Amendment Request (LAR) to Adopt National Fire Protection Association (NFPA) 805 Performance-Based Standard for Fire Protection for Light-Water Reactor Generating Plants, dated September 26, 2013, Agencywide Document and Management System (ADAMS) Accession Number ML13276A126.
2. NRC Letter, McGuire Nuclear Station, Units 1 and 2 - Acceptance Review Results RE: License Amendment Request to Adopt National Fire Protection Association 805 Performance-Based Standard for Fire Protection for Light-Water Reactor Generating Plants, (TAC Nos. MF2934 and MF2935), dated December 31, 2013, ADAMS Accession Number ML13354B879.
3. MNS Letter, Supplemental Information For License Amendment Request (LAR) to Adopt National Fire Protection Association (NFPA) 805 Performance-Based Standard for Fire Protection for Light-Water Reactor Generating Plants, dated January 8, 2014, ADAMS Accession Number ML14016A097.
4. NRC Letter, McGuire Nuclear Station, Units 1 and 2 - Acceptance of Requested Licensing Action RE: License Amendment Request to Adopt National Fire Protection Association (NFPA) 805 Performance-Based Standard for Fire Protection for Light-Water Reactor Generating Plants (TAC Nos. MF2934 and MF2935), dated January 15, 2014, ADAMS Accession Number ML14014A279.

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5. NRC Letter, Request for Information Regarding License Amendment Request To Implement A Risk-Informed Performance-Based Fire Protection Program (TAC Nos. MF2934 and MF2935), dated August 28, 2014, ADAMS Accession Number ML14233A366.
6. MNS Letter, Response to August 28, 2014, NRC Request for Additional Information Regarding License Amendment Request To Implement A Risk-Informed Performance-Based Fire Protection Program, dated October 13, 2014, ADAMS Accession Number ML14297A162.
7. NRC Letter, Request for Information Regarding License Amendment Request To Implement A Risk-Informed Performance-Based Fire Protection Program (TAC Nos. MF2934 and MF2935), dated October 27, 2014, ADAMS Accession Number ML14295A307.
8. MNS Letter, Response to August 28, 2014, NRC Request for Additional Information Regarding License Amendment Request To Implement A Risk-Informed Performance-Based Fire Protection Program, dated November 12, 2014, ADAMS Accession Number ML14328A628.
9. MNS Letter, Response to August 28, 2014, NRC Request for Additional Information Regarding License Amendment Request To Implement A Risk-Informed Performance-Based Fire Protection Program, dated December 12, 2014, No ADAMS Number.
10. MNS Letter, Response to August 28, 2014, NRC Request for Additional Information Regarding License Amendment Request To Implement A Risk-Informed Performance-Based Fire Protection Program, dated January 26, 2015, ADAMS Accession Number ML15036A084.
11. MNS Letter, Response to August 28, 2014, NRC Request for Additional Information Regarding License Amendment Request to Implement A Risk-Informed Performance-Based Fire Protection Program, dated February 27, 2015, No ADAMS Number.
12. MNS Letter, Response to August 28, 2014, NRC Request for Additional Information Regarding License Amendment Request to Implement A Risk-Informed Performance-Based Fire Protection Program, dated March 13, 2015, No ADAMS Number.
13. NRC Letter, Request for Additional Information Regarding License Amendment Request To Implement A Risk-Informed Performance-Based Fire Protection Program, dated May 8, 2015, ADAMS Accession Number ML15125A328.
14. NRC Letter, Request for Additional Information Regarding License Amendment Request To Implement A Risk-Informed Performance-Based Fire Protection Program, dated June 18, 2015, ADAMS Accession Number ML15147A628.
15. MNS Letter, Response to June 18, 2015, NRC Request for Additional Information Regarding License Amendment Request to Implement a Risk-Informed Performance-Based Fire Protection Program, dated July 15, 2015.
16. NRC Letter, Request for Additional Information Regarding License Amendment Request To Implement a Risk-Informed Performance-Based Fire Protection Program, dated August 18, 2015.
17. MNS Letter, Response to June 18, 2015, and May 8, 2015, NRC Requests for Additional Information Regarding License Amendment Request to Implement a Risk-Informed Performance-Based Fire Protection Program, dated August 20, 2015.

By letter dated September 26, 2013 (Reference 1), Duke Energy submitted a LAR to adopt a new, risk-informed, performance-based (RI-PB) fire protection licensing basis for the MNS Units 1 and 2.

On December 31, 2013 (Reference 2), the NRC requested supplemental information in order to make the September 26, 2013, LAR complete and acceptable for review by the NRC. By letter dated January 8, 2014 (Reference 3), Duke Energy provided the requested supplemental information to the NRC. By letter dated January 15, 2014 (Reference 4), the NRC accepted the September 26, 2013, LAR for review.

By letters dated August 28, 2014, and October 27, 2014 (References 5 and 7, respectively), the NRC requested additional information (RAI) in order to complete their review of the September 26, 2013, LAR. Those letters grouped the RAIs into 60-day, 90-day, 120-day, and radiation release responses. Duke Energy provided the 60-day, 90-day, and some of the 120-day RAI responses by letters dated October 13, 2014, November 12, 2014, and December 12, 2014 (References 6, 8, and 9, respectively). Responses to the radiation release RAIs and some of the remaining 120-day RAIs were provided by letter dated January 26, 2015 (Reference 10).

By letter dated February 27, 2015 (Reference 11), Duke Energy submitted responses to all remaining first-round RAIs, excluding Probabilistic Risk Assessment (PRA) RAI 03. This submittal also included revised responses to PRA RAI 12 and PRA RAI 17. By letter dated March 13, 2015 (Reference 12), Duke Energy submitted response to PRA RAI 03.

By letters dated July 15, 2015 (Reference 15), and August 20, 2015 (Reference 17), Duke Energy submitted responses to the second-round PRA and fire modeling (FM) RAIs (References 14 and 13).

McGuire's response to safe shutdown analysis (SSA) RAI.08 (Reference 16) is enclosed in Enclosure 1 of this letter.

The conclusions reached in the original determination that the September 26, 2013, LAR contains No Significant Hazards Considerations and the categorical exclusion from performing an Environmental/Impact Statement have not changed as a result of the RAI responses in Enclosure 1.

This submittal does not contain any new or revised regulatory commitments.

Please direct any questions on this matter to Brian Richards at (980) 875-5171.

I declare under penalty of perjury that the foregoing is true and correct. Executed on September 9, 2015.

Sincerely,

Steven D. Capps

Enclosure 1

xc:

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ENCLOSURE 1

Duke Energy Response to the MNS NFPA 805 LAR
SSA RAI (Second-Round)

REQUEST FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST TO ADOPT

NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 805

PERFORMANCE BASED STANDARD FOR FIRE PROTECTION

FOR LIGHT WATER REACTOR GENERATING PLANTS

DUKE ENERGY CAROLINAS, LLC

MCGUIRE NUCLEAR STATION UNITS 1 AND 2

DOCKET NOS. 50-369, 50-370

By letter dated September 26, 2013, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13276A126), Duke Energy Carolinas (Duke) submitted a license amendment request to change its fire protection program to one based on the National Fire Protection Association (NFPA) Standard-805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition, as incorporated into Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.48(c). In order for the U. S. Nuclear Regulatory Commission (NRC) staff to complete its review of the license amendment request (LAR), the following additional information is requested:

SSA RAI 08

Regulatory Position C.2.4 in Regulatory Guide (RG) 1.205, "Risk-Informed, Performance Based Fire Protection for Existing Light-Water Nuclear Power Plants" states that there are two cases where operator actions taken outside the main control room may be considered as taking place at a primary control station. These two cases involve dedicated shutdown or alternative shutdown controls, which have been reviewed and approved by the NRC.

On Monday, July 27, 2015, the licensee verbally informed the NRC staff that of all the fire areas that credit the Standby Shutdown Facility (SSF) as the success path to meet the nuclear safety performance criteria (NSPC) in the McGuire Nuclear Safety Capability Analysis (NSCA), the use of the SSF to meet the safe shutdown requirements in one fire area had not been previously reviewed and approved by the NRC in the deterministic licensing basis.

Utilization of the Alternative/Dedicated Shutdown strategy in a fire area that had not been previously approved by the NRC staff is a modification to the previously approved strategy.

a) Provide a detailed description of the modification to the dedicated or alternative shutdown strategy sufficient for the NRC staff to verify that the strategy meets the attributes provided in RG 1.205 Section C.2.4 (electrical independence, command and control, instrumentation, actions necessary to enable (if required), etc.).

b) In addition, provide sufficient design information to provide assurance that connections/interconnections with safety-related plant systems will not cause a reduction in the capability, redundancy, diversity, or design margin for those systems.

c) Since the proposed change involves the use of the previously reviewed and approved SSF, verify that the use of the SSF for the fire area in question will not invalidate any of the previously approved attributes of the alternative/dedicated shutdown strategy (electrical independence, command and control, instrumentation, actions necessary to enable, etc.).

d) Verify that upon successful startup and enabling of the SSF, the credited success path is physically and electrically independent of the fire area resulting in the SSF strategy meeting the deterministic requirements of NFPA 805 Section 4.2.3.

McGuire Response:

a) Fire Area 25 originally credited shutdown from the Main Control Room for a fire event in the area. The credited method for shutdown for a fire event in the Fire Area was revised to credit the Standby Shutdown System (SSS), or transfer of control to the SSF, shortly after issuance of NUREG-0422; Supplement No. 6; Safety Evaluation Report related to operation of McGuire Nuclear Station, Units 1 and 2; Duke Power Company; Office of Nuclear Reactor Regulation; U.S. Nuclear Regulatory Commission; Docket Nos. 50-369 and 50-370; February, 1983 Section C.2 "CONFORMANCE WITH PARAGRAPH III.G, FIRE PROTECTION OF SAFE

SHUTDOWN CAPABILITY." The NRC was notified in a letter dated 10/1/1985 of this update.

Fire Area 25 meets all the criteria (electrical independence, command and control, instrumentation, actions necessary to enable) for a 3.G.III Alternate Shutdown Fire Area.

Fire Area 25 consists of the Auxiliary Building common elevation 767'. The Fire Area predominantly contains the redundant trains of Control Room and Control Room area (Equipment Rooms, Cable Room, and Battery Room) ventilation equipment including the chilled water pumps, chillers, and air handling units. A fire in the area has the potential to affect functionality of Control Room, Control Room area, and Essential Switchgear Room ventilation. Equipment affected by a fire in the area could affect Control Room habitability as well as reliable operation of safety related electronic equipment; therefore, Fire Area 25 credits transfer of control to the SSF to achieve the Nuclear Safety Performance Criteria. With control at the SSF, the capability exists to provide negative Reactivity, control Reactor Coolant Inventory and Pressure, remove Decay Heat, and view required indication to monitor plant conditions.

The activation of the SSS, or transfer of control to the SSF, is initiated by entry into AP / 1(2) / A / 5500 / 24 "LOSS OF PLANT CONTROL DUE TO FIRE OR SABOTAGE". Therefore, SSS/SSF activation as a result of a fire event in Fire Area 25 is consistent with the other SSS credited Fire Areas previously reviewed and approved by the NRC (Reference: NUREG-0422; Supplement No. 6; Safety Evaluation Report related to operation of McGuire Nuclear Station, Units 1 and 2; Duke Power Company; Office of Nuclear Reactor Regulation; U.S. Nuclear Regulatory Commission; Docket Nos. 50-369 and 50-370; February, 1983 Section C.2 "CONFORMANCE WITH PARAGRAPH III.G, FIRE PROTECTION OF SAFE SHUTDOWN CAPABILITY"). SSS activation for a fire event in Fire Area 25 uses the identical AP / 1(2) / A / 5500 / 24 procedure to transfer control to the SSF.

Part (b) of this RAI response details electrical independence and reflects the SSS activation sequence at a high level.

b) The SSS design interfaces with predominantly A Train components. There is also a small number of B Train components related to the SSS scheme. The SSS design scheme is the same for all Fire Areas previously documented in the Safety Evaluation which credit the transfer of control to the SSF and nothing is introduced as new in the Fire Area 25 assignment.

There are no issues in Fire Area 25 which would prevent the transfer of control to the SSF and achieving the Nuclear Safety Performance Criteria. The SSS design scheme is described below:

- Isolates and realigns 600VAC safety related power to the non-safety SSF power system for MCCs 1(2)EMXA4 and 1EMXH1. In the event that Offsite Power (OSP) is not available, the non-safety SSF Diesel Generator (D/G) is credited. The safety and non-safety power feeds are independently kirk-key interlocked to preclude paralleling of sources, operational errors, and spurious operations between sources.

- Isolates plant circuits and aligns SSF control circuits for certain A Train components to non-safety SSF control circuits. These are actuated from auxiliary switches actuated by the breaker manipulations mentioned above. As discussed in DC-1.01-1, *Standby Shutdown System (SSS) Separation Criteria - McGuire*, "where a component serves normal plant and SSS functions, the normal plant control circuit for that component (whether QA Condition 1 or non-QA Condition 1) must be isolated from the component when in the SSS mode, in order to protect the SSS function from electrical faults originating in the normal plant controls. This isolation may be provided by the switches or relays that transfer the component from normal plant to SSF control." SSS controls are isolated where they are electrically tied to QA Condition 1 circuits and optical isolators may be used.
- The B Train components are routed into a fire rated bunker in the Train A Essential Switchgear Room. Within the Train A Essential Switchgear Room, there are three disconnect plugs which cause the components to automatically fail closed upon the plugs being manually disconnected. These actuate by the fail safe design (i.e. de-energizing solenoids).
- Isolates and realigns 125VDC safety related power to non-safety SSF power system for 1EVDA1 and 2EVDA1 to allow control of the Train A Head Vent Valves from the SSF. The safety and non-safety power feeds are kirk key interlocked to preclude paralleling of sources, operational errors, and spurious operations between sources.
- Predominantly the SSF uses its own instrumentation transmitters powered from the SSF power system. It may have commonality with normal plant instrumentation tubing which is unaffected by fires in plant area crediting the SSF.

c) As discussed in part (a) and (b) of this RAI response, SSS activation as a result of a fire event in Fire Area 25 is identical to SSS activation for any other Fire Area that the SSS is the assured train. Thus, independence, command and control, instrumentation, and activation actions are the same which precludes the possibility of a conflict.

d) The performance criteria for successful SSF operation as a result of a fire event in Fire Area 25 is the same as all other SSS credited Fire Areas. All associated SSS components had cabling and location of the cabling (routing) identified. A deterministic analysis was performed for all fire areas. The least impacted success path for Fire Area 25 was determined to be SSS. Any impacts to the SSS success path due to a fire in the fire area were identified as Variance From Deterministic Requirements (VFDRs) and processed in Fire Risk Evaluation (FRE). The NFPA 805 LAR Attachment C (B-3 table) itemizes Fire Area 25 VFDRs and the risk assessment.