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U.S. Nuclear Regulatory Commission
Washington, DC 20555-001

ATTENTION: Document Control Desk

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

Subject: Response to NRC letter dated August 27, 2015, "McGuire Nuclear Station, Units 1 AND 2: Request for Additional Information Regarding License Amendment Request Nuclear Service Water System Allowed Outage Time Extension (TAC NOS. MF2983 AND MF2984)"

References:

1. Duke Energy Letter dated June 30, 2015, "License Amendment Request for Temporary Changes to Technical Specifications for Correction of an 'A' Train Nuclear Service Water System (NSWS) Degraded Condition" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15191A025).

2. Nuclear Regulatory Commission (NRC) Letter dated July 27, 2015 "McGuire Nuclear Station, Units 1 and 2 - Acceptance Review of License Amendment Request RE: Temporary Changes to Technical Specifications for Correction of Nuclear Service Water System Degraded Condition (TAC NOS. MF6409 AND MF6410)" (ADAMS Accession No. ML15202A661)

3. Duke Energy Letter dated August 11, 2015, "Response to Request for Additional Information Regarding License Amendment Request for Temporary Changes to Technical Specifications for Correction of an 'A' Train Nuclear Service Water System (NSWS) Degraded Condition (TAC Nos. MF6409 and MF 6410)" (ADAMS Accession No. ML15247A066)

4. NRC Letter dated August 27, 2015, "McGuire Nuclear Station, Units 1 AND 2: Request for Additional Information Regarding License Amendment Request Nuclear Service Water System Allowed Outage Time Extension (TAC NOS. MF2983 AND MF2984)" (ADAMS Accession No.ML15237A416)

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NRR

By letter dated June 30, 2015 (Reference 1), Duke Energy requested a license amendment for the Renewed Facility Operating Licenses (FOL) and Technical Specifications (TS) for the McGuire Nuclear Station, Units 1 and 2, to allow temporary changes to TS 3.5.2, Emergency Core Cooling System (ECCS) - Operating; TS 3.6.6, Containment Spray System (CSS); TS 3.7.5, Auxiliary Feedwater (AFW) System; TS 3.7.6, Component Cooling Water (CCW) System; TS 3.7.7, Nuclear Service Water System (NSWS); TS 3.7.9, Control Room Area Ventilation System (CRAVS); TS 3.7.11, Auxiliary Building Filtered Ventilation Exhaust System (ABFVES), and TS 3.8.1, AC Sources- Operating.

By letter dated August 11, 2015 (Reference 3), Duke Energy responded to NRC letter dated July 27, 2015 (Reference 2), request for additional information (RAI) needed for completion of NRC staff review of the proposed LAR.

By letter dated August 27, 2015 (Reference 4), the NRC provided Duke Energy a second RAI needed for completion of the NRC staff review of the LAR. The enclosure provides Duke Energy's responses to the RAI questions. Attachment 1 in the enclosure revises commitment 13 and adds a new commitment 31 to the Regulatory Commitments described in Reference 1.

The conclusions reached in the original determination that the June 30, 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 the enclosure

Pursuant to 10CFR50.91, a copy of this LAR has been forwarded to the appropriate North Carolina state officials.

Please direct any comments or questions regarding this submittal to George Murphy at (980) 875-5715.

I declare under penalty of perjury that the foregoing is true and correct. Executed on September 24, 2015.

Sincerely,

Steven D. Capps

Enclosure:

Response to Request for Additional Information

cc w/ Attachments:

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ENCLOSURE

Response to Request for Additional Information

REQUEST FOR ADDITIONAL INFORMATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO A LICENSE AMENDMENT REQUEST SUPPORTING CORRECTION OF A NUCLEAR SERVICE WATER SYSTEM DEGRADED CONDITION
DUKE ENERGY CAROLINAS, LLC
MCGUIRE NUCLEAR STATION, UNITS 1 AND 2
DOCKET NOS. 50-369 AND 50-370

By letter dated June 30, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15191A025), Duke Energy Carolinas, LLC (Duke Energy) submitted a license amendment request (LAR) to temporarily change McGuire Nuclear Station (MNS), Units 1 and 2, Technical Specifications (TSs) for correction of a degraded condition affecting the 'A' Train of the nuclear service water system (NSWS). The requested amendment would temporarily change the following TSs to allow the inoperability of the 'A' Train of the NSWS for a total of up to 14 days: TS 3.5.2, Emergency Core Cooling System (ECCS) - Operating; TS 3.6.6, Containment Spray System (CSS); TS 3.7.5, Auxiliary Feedwater (AFW) System; TS 3.7.6, Component Cooling Water (CCW) System; TS 3.7.7, Nuclear Service Water System (NSWS); TS 3.7.9, Control Room Area Ventilation System (CRAVS); TS 3.7.11, Auxiliary Building Filtered Ventilation Exhaust System (ABFVES), and TS 3.8.1, AC Sources-Operating. The 'A' Train of the shared NSWS would be inoperable while the safety-related supply from the MNS Nuclear Service Water Pond was drained and isolated to correct a degraded condition affecting that line.

Based on the NRC staff's review of this amendment request, the NRC staff has determined the following additional information is necessary to support completion of its technical review:

SBPB-RAI-001

The LAR included a potential activity to install a piping penetration in the drained section of the NSWS within the auxiliary building if required for personnel access to remove suspected blockage. The LAR also included information indicating the opening in the pipe for personnel access establishes the potential for NSWS leakage into the auxiliary building. To ensure against the potential for significant leakage, the LAR indicated that the Standby Nuclear Service Water Pond (SNSWP) water source would be isolated by the installation of a bolted flange and the Lake Norman water source would be isolated by closure of 0RN-7A under procedural controls. Dedicated personnel and procedures would be established to address excessive leakage past the valve. However, the MNS Updated Final Safety Analysis Report included information indicating the auxiliary building is a Category 1 structure that is sealed to provide protection against external flooding. Although unlikely, the procedural control of valve 0RN-7A position creates the credible potential for inadvertent opening of the valve while the piping penetration in the auxiliary building is open that could cause flooding of the auxiliary building from Lake Norman.

Please clarify how this approach is consistent with defense-in-depth, particularly the principal of avoiding an over-reliance on programmatic activities. The programmatic control of the 0RN-7A

valve position and the programmatic response to significant valve leakage should have reliability commensurate with the likelihood and consequences of significant leakage past valve 0RN-7A with an opening in the pipe within the auxiliary building. The NRC staff requests additional information that addresses these considerations. As appropriate, these considerations may be addressed by eliminating the need for a piping penetration within the auxiliary building, establishing by analysis that the consequences of flooding through the auxiliary building penetration would be small (e.g., passive barriers within the auxiliary building would protect essential equipment from flooding through that path), or providing independent additional piping isolations (e.g., a freeze seal in the NSWS piping between valve 0RN-7A and Lake Norman).

Duke Energy Response to SBPB-RAI-001

0RN-7A will be used as the isolation barrier between Lake Norman and the new NSWS piping manway in the auxiliary building. Isolation will be controlled via the plants clearance and tag out process. The tag out process requires Senior Reactor Operator (SRO) approval for changes in plant component configuration. For defense-in-depth, Operations will utilize the concurrent dual verification process that requires an additional parallel verification of plant/system conditions, hands on the correct component, and an understanding of the intent of actions prior to actual operation of 0RN-7A. Additionally, control of the new manway will be under the clearance and tag out process for 0RN-7A such that 0RN-7A cannot be opened unless the manway is closed.

The tag out process will place danger tags on the 0RN-7A actuator motor operator breaker as well as the hand wheel. The tag out process will maintain the 0RN-7A actuator motor breaker locked in the off position and the mechanical hand wheel will be locked closed with a restraining device to prevent inadvertent operation via bumping of 0RN-7A.

In summary, the programmatic control of 0RN-7A under the clearance and tag out program ensures that 0RN-7A will be maintained closed during periods when the new NSWS piping manway is open. This includes the tagging and locking of the Motor Control Center breaker for 0RN-7A and the placement of a restraining device with a lock on the hand wheel of 0RN-7A. The reliability of this programmatic control will be enhanced by the addition of concurrent dual verification for any operation of 0RN-7A during the LAR activity, a step in the tag out checklist for verification that the new NSWS manway is closed prior to opening 0RN-7A.

Zero leakage cannot be guaranteed for 0RN-7A. Prior to performing the activities described in the LAR, the motor operator will be tested and adjusted for the optimum closure position and torque for minimal seat leakage. If the new manway is required for access to remove the blockage, then prior to cutting the pipe for access, an evaluation of leakage will be performed to validate proper isolation and ensure that 0RN-7A leakage is within expected limits.

0RN-7A is a motor operated butterfly valve with its actuator stem in the approximate center of the valve disk. This design (stem in center of disk), results in application of pressure on the butterfly disk due to natural forces (head pressure of Lake Norman), which keeps the butterfly disk against its closed valve seat when the valve is in the closed position.

A review of operating experience and of manufacturer information for failure modes and concerns with valves like 0RN-7A has yielded no information that would challenge the expectation for 0RN-7A to be a reliable isolation point for protection against unacceptable leakage into the auxiliary building while the auxiliary building NSWS manway is open. No

credible failures have been identified that would suggest a failure resulting in a leak scenario outside the scope of discussion described in this response.

During periods when the new NSWS manway is open, dedicated personnel having communication to the main control room with procedures to continuously monitor and respond to 0RN-7A leakage will be in place. If leakage increases and reaches the pre-determined leak rate limit, the repair activity will be stopped, and the manway will be closed. If conditions prevent the prompt closure of the manway, then operations will place the 'B' NSWS train in operation, secure 'A' NSWS operations and isolate the 'A' NSWS train to stop the leakage within 30 minutes. Existing commitment 13 will be revised to include the additional actions described above.

The Unit 2 Auxiliary Feedwater pumps and Auxiliary Shutdown Panel equipment are physically located in the room where the new NSWS manway opening will be installed. This room drains to the auxiliary building Ground Water Drainage (WZ) sump, which has the capability of removing up to 500 gpm via two 250 gpm capacity WZ pumps that have emergency power supplies and are also located in the same room as 0RN-7A.

The design basis flood elevation for the affected room is 12 inches above the floor elevation. The Auxiliary Feedwater pumps and Auxiliary Shutdown Panel are not affected by flooding until water level exceeds 20 inches above the floor elevation in the room.

It would take approximately 21,000 gallons of water in the Unit 2 Auxiliary Feedwater pump room to exceed the design basis flood level of 12 inches. It would take approximately thirty minutes to reach this volume of water assuming that 0RN-7A leakage is 700 gpm with no credit for mitigation by the WZ sump pumps. Leakage for 0RN-7A is not expected to exceed a worst case leak rate of 50-100 gpm. Assuming a 0RN-7A seat leakage limit of 100 gpm, the time available to isolate NSW would be approximately three and a half hours.

If manway closure is not possible then leakage from 0RN-7A via the new manway could be stopped with the use of dedicated personnel and procedural guidance well within the time before exceeding the design basis flood elevation in the Unit 2 Auxiliary Feedwater pump room of 12 inches.

SBPB-RAI-002

The LAR describes activities and design features that provide protection against macro-fouling of the NSWS from Lake Norman (i.e., inspection of fish barrier) and the SNSWP (i.e., fish population controls, fish population survey, and fish barrier). Please describe how the timeliness of these activities in managing the potential for macro-fouling will be verified prior to removing the SNSWP supply to 'A' NSWS Train from service.

Duke Energy Response to SBPB-RAI-002

Historically, the potential for macro-fouling at the Low Level Intake (LLI) structure is higher during the months of July to August when the alewife fish are drawn to higher levels of dissolved oxygen caused by a natural lake cycle with cold water in the hypo limnetic layers. By September, the higher dissolved oxygen levels are gone, and the fish move out of the hypo limnetic layers. During the July to August period, McGuire monitors the fish movement with acoustic surveys performed weekly. In addition, underwater live cameras were installed in June 2015 and are used to monitor fish concentrations in the area above the LLI structure.

The activities discussed in the LAR will not be performed during the seasonal conditions that cause alewife macro-fouling phenomena. Existing Regulatory Commitment 25 in Reference 1 states: "Prior to entering the 14 day CT perform an evaluation to ensure that there will be no anticipated impact to 'A' NSWS water supply from the LLI from alewife fish the during 14 day CT". This evaluation will review the timing of the LAR activities to ensure that they will not be performed during the seasonal time interval (July through August) when the alewife fish congregate at the LLI. The timing of the LAR activities is also bounded by existing Regulatory Commitment 19, which excludes the performance of the LAR activities during the months of June through October due to the rise in potential for tornados.

ATTACHMENT 1

Regulatory Commitments

REGULATORY COMMITMENTS

The following table identifies those actions committed to by Duke Energy in this document. Any other statements made in this licensing submittal are provided for informational purposes only and are not considered to be regulatory commitments. Please direct any questions you may have in this matter to George Murphy at 980-875-5715.

#	REGULATORY COMMITMENTS
1	The 'A' Train NSWS pumps will remain running and aligned to Lake Norman during the extended CT until the system is ready for post maintenance testing.
2	Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time
3	The 'B' Train NSWS will be placed in its ESFAS alignment to the SNSWP water source with the 'B' Train pumps in standby prior to starting the LAR activity and remain in this alignment until the 'A' Train NSWS SNSWP water source is restored and ready for post maintenance testing.
4	Procedures will be established to provide an additional defense in depth contingency that could be used in the event of an extremely low probability of a loss of the Lake Norman water source due to a seismic event. The procedures will ensure that system operation is maintained within design limits (less than or equal to 2 NSWS pumps running on a header), control of maximum system flow, and that system configuration prevents interaction of the degraded equipment with the functional equipment.
5	Fukushima Response FLEX modifications will be installed and the FLEX strategies will be available for implementation as additional defense-in-depth on both units.
6	During the period in which the 'A' NSWS suction path from the SNSWP is non-functional, no discretionary maintenance or discretionary testing will be planned on the following: a. 1A EDG b. 2A EDG c. The 'A' Train of NSWS excluding the activities described in the LAR for the 'A' Train NSWS piping to the SNSWP. d. The 'B' Train of NSWS, ECCS, CSS, AFW, CCW, CRAVS, ABFVES or the EDGs e. The switchyard and other offsite power sources f. The SSF
7	A condition in which repairs could impact the ability of an SSC to perform its Safety Function would result in termination of activities. The inspection may identify a condition that cannot be resolved within the 14 day completion time. Should such a condition be identified then the system will be restored to its current OBDN condition. If the ROV survey presents any opportunities for a less intrusive or less time consuming solution for addressing the OBDN condition, then these opportunities will be pursued, as appropriate.
8	In an activity planned to be performed this summer separate from the 14 day completion time repair activity, 0RN-7A will be tested for leakage and adjusted if necessary to minimize leakage.
9	In an activity planned to be performed this summer separate from the 14 day completion time repair activity the SNSWP isolation flange will be test fitted to the 'A' SNSWP pipe.

10	Procedure guidance will establish controls to limit evacuation air pressure to less than a predetermined value in order to prevent air intrusion into the operating NSWS.
11	Dedicated personnel with procedure guidance will be provided to close the pathway from the auxiliary building on the affected 'A' Train NSWS piping from the SNSWP in the event of any of the following: • An Engineered Safety Feature (ESF) actuation • Entry into RP/0/A/5700/006 Natural Disasters • Entry into RP/0/A/5700/007 Earthquake
12	This activity will be controlled under the Infrequently Performed Test or Evolution (IPTE) process defined in Fleet Directive AD-OP-ALL-106, "Conduct of Infrequently Performed Tests or Evolutions", and Duke Energy's Work Management and Execution procedures.
13	~~Dedicated personnel will be available for monitoring and immediate response to unanticipated leakage. Procedural actions will provide guidance to stop the leakage. If the leakage cannot be stopped, then dedicated personnel will establish NSWS flow from the 'B' Train NSWS, shutdown the 'A' Train NSWS pumps and close 0RN-12AC to stop the leakage.~~ During periods when the new NSWS manway is open, dedicated personnel having communication to the main control room with procedures to continuously monitor and respond to 0RN-7A leakage will be in place. If leakage increases and reaches the pre-determined leak rate limit, the repair activity will be stopped, and the manway will be closed. If conditions prevent the prompt closure of the manway, then operations will place the 'B' NSWS train in operation, secure 'A' NSWS operations and isolate the 'A' NSWS train to stop the leakage.
14	If the second personnel access opening is necessary, then prior to the opening of the system an evaluation of leakage will be performed to validate proper isolation and that leakage is within expected limits.
15	McGuire will communicate with the Transmission Control Center (TCC) to ensure that the McGuire Control Room is notified in the event of potential grid disturbances in order that an appropriate plant response can be formulated.
16	The Work Control Center or OCC will monitor weather forecasts and radar during the activities that require the NSWS piping personnel access points to be open to assess the potential for severe weather conditions (tornado, thunderstorms).
17	Training will be provided in accordance with the Systematic Approach to Training (SAT) process to Operations personnel on this TS change and the associated evolution to inspect and correct the degraded condition in the 'A' NSWS supply piping from the SNSWP.
18	Operations will review applicable abnormal operating procedures related to the response to an earthquake, the loss of the Lake Norman and the loss of NSWS prior to making 'A' NSWS suction path from the SNSWP inoperable and each shift until 'A' Train NSWS operability is restored.
19	The repair work on the NSWS 'A' Train suction from the SNSWP will be scheduled during a period in which hurricanes and tornadoes have a lower likelihood of occurrence.
20	The Outage Command Center (OCC) will be manned while performing the activities authorized by this amendment.

21	The following list of equipment will be protected: a. 'B' Train NSWS b. 1B EDG c. 2B EDG d. 1B ECCS e. 2B ECCS f. 1B CSS g. 2B CSS h. 1B AFW i. 2B AFW j. 1B CCW k. 2B CCW l. B CRAVS m. B ABFVES n. Auxiliary Building WZ Sump and equipment supporting function of sump
22	If required to be installed the new personnel access opening to be located on the 'A' Train NSWS piping in the auxiliary building will be designed and installed in accordance with the Engineering Change Process.
23	Foreign Material Exclusion (FME) will be controlled during the proposed activities in accordance with AD-MN-ALL-0002, Foreign Material Exclusion (FME). Any debris resulting from the obstruction removal activity will be mechanically cleaned out before the system is closed for return to service per FME plan developed in accordance with the above procedure. The system will be video inspected and reversed flushed from the LLI to the SNSWP with isolation to downstream components to force any sediment back to the SNSWP.
24	Following 'A' Train NSWS restoration, testing will be performed to verify that the as left NSWS performance meets or exceeds pre-activity performance including 'A' Train NSW pump NPSH conditions.
25	Prior to entering the 14 day CT perform an evaluation to ensure that there will be no anticipated impact to 'A' NSWS water supply from the LLI from Alewife fish the during 14 day CT.
26	The new personnel access piping opening (in the auxiliary building) will be controlled by using procedures developed or revised for this purpose to maintain positive control of the opening and to prevent an unmonitored release.
27	The ERAT program includes the option to use a SSA (Safety Significant Activity) code which will cause the risk condition color to be "YELLOW". MNS will use this code during the activities described in this LAR.
28	Designated operators will be available to execute the manual actions associated with aligning the affected unit's 'A' Train NSWS pump to the 'B' NSWS SNSWP via the Main Supply Crossover piping.
29	If the contingency personnel access opening is installed, then Security personnel will establish the proper controls and compensatory measures prescribed by security procedures and the security plan.

30	In support of the contingency the following conditions will be established before the start of activities in the LAR: • The 'A' valve (0RN-14A) will be opened prior to the evolution and power will be removed from the valve operator. • The 'B' valve (0RN-15B) will be maintained closed with the ESFAS signal from each unit blocked prior to the evolution. Maintaining 0RN-15B closed with power removed satisfies operability requirements for the 'B' Train NSWS. The 'B' valve (0RN-15B) can be opened from the control room after power is restored if conditions warrant the use of this contingency.
31	Operations will utilize the concurrent dual verification process when operating 0RN-7A.