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

March 16, 2016

Mr. Steven D. Capps
Vice President
McGuire Nuclear Station
Duke Energy Carolinas, LLC
12700 Hagers Ferry Road
Huntersville, NC 28078

SUBJECT: MCGUIRE NUCLEAR STATION, UNITS 1 AND 2: ISSUANCE OF LICENSE AMENDMENT REGARDING NUCLEAR SERVICE WATER SYSTEM ALLOWED OUTAGE TIME EXTENSION (CAC NOS. MF6409 AND MF6410)

Dear Mr. Capps:

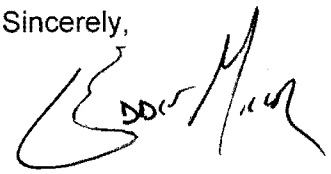
The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 282 to Renewed Facility Operating License NPF-9 and Amendment No. 261 to Renewed Facility Operating License NPF-17 for the McGuire Nuclear Station, Units 1 and 2. The amendments consist of changes to the Technical Specifications in response to your application dated June 30, 2015, as supplemented by letters dated August 11, 2015, September 24, 2015, October 8, 2015, December 7, 2015, February 10, 2016, and February 25, 2016.

The amendments modify selected Technical Specification Completion Times to support repair activities associated with the Nuclear Service Water System, Train 'A'.

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

If you have any questions, please call me at 301-415-2481.

Sincerely,



G. Edward Miller, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-369 and 50-370

Enclosures:
1. Amendment No. 282 to NPF-9
2. Amendment No. 261 to NPF-17
3. Safety Evaluation

cc w/encls: Distribution via Listserv

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

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. 50-369

MCGUIRE NUCLEAR STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 282
Renewed License No. NPF-9

1. The Nuclear Regulatory Commission (the Commission) has found that:

A. The application for amendment to the McGuire Nuclear Station, Unit 1 (the facility), Renewed Facility Operating License No. NPF-9, filed by the Duke Energy Carolinas, LLC (licensee), dated June 30, 2015, as supplemented by letters dated August 11, 2015, September 24, 2015, October 8, 2015, and December 7, 2015, February 10, 2016, and February 25, 2016, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;

B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;

D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-9 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 282, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to License No. NPF-9
and the Technical Specifications

Date of Issuance: March 16, 2016

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

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. 50-370

MCGUIRE NUCLEAR STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 261
Renewed License No. NPF-17

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment to the McGuire Nuclear Station, Unit 2 (the facility), Renewed Facility Operating License No. NPF-17, filed by the Duke Energy Carolinas, LLC (the licensee), dated June 30, 2015, as supplemented by letters dated August 11, 2015, September 24, 2015, October 8, 2015, and December 7, 2015, February 10, 2016, and February 25, 2016, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-17 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 261, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to License No. NPF-17
and the Technical Specifications

Date of Issuance: March 16, 2016

ATTACHMENT TO

LICENSE AMENDMENT NO. 282

RENEWED FACILITY OPERATING LICENSE NO. NPF-9

DOCKET NO. 50-369

AND

LICENSE AMENDMENT NO. 261

RENEWED FACILITY OPERATING LICENSE NO. NPF-17

DOCKET NO. 50-370

Replace the following pages of the Renewed Facility Operating Licenses and the Appendix A Technical Specifications (TSs) with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
License Pages	License Pages
NPF-9, page 3	NPF-9, page 3
NPF-17, page 3	NPF-17, page 3
TS Pages	TS Pages
3.5.2-1	3.5.2-1
3.6.6-1	3.6.6-1
3.6.6-2	3.6.6-2
3.7.5-1	3.7.5-1
3.7.5-2	3.7.5-2
3.7.6-1	3.7.6-1
3.7.7-1	3.7.7-1
3.7.7-2	3.7.7-2
3.7.9-1	3.7.9-1
3.7.9-3	3.7.9-3
--	3.7.9-4
3.7.11-1	3.7.11-1
3.8.1-3	3.8.1-3

4) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;

(5) Pursuant to the Act and 10 CFR Parts 30, 40 and 70, to possess, but not separate, such byproducts and special nuclear materials as may be produced by the operation of McGuire Nuclear Station, Units 1 and 2, and;

(6) Pursuant to the Act and 10 CFR Parts 30 and 40, to receive, possess and process for release or transfer such byproduct material as may be produced by the Duke Training and Technology Center.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility at a reactor core full steady state power level of 3469 megawatts thermal (100%).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No.282 , are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Updated Final Safety Analysis Report

The Updated Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on December 16, 2002, describes certain future activities to be completed before the period of extended operation. Duke shall complete these activities no later than June 12, 2021, and shall notify the NRC in writing when implementation of these activities is complete and can be verified by NRC inspection.

The Updated Final Safety Analysis Report supplement as revised on December 16, 2002, described above, shall be included in the next scheduled update to the Updated Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following issuance of this renewed operating license. Until that update is complete, Duke may make changes to the programs described in such supplement without prior Commission approval, provided that Duke evaluates each such change pursuant to the criteria set forth in 10 CFR 50.59 and otherwise complies with the requirements in that section.

(4) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;

(5) Pursuant to the Act and 10 CFR Parts, 30, 40 and 70, to possess, but not separate, such byproducts and special nuclear materials as my be produced by the operation of McGuire Nuclear Station, Units 1 and 2; and,

(6) Pursuant to the Act and 10 CFR Parts 30 and 40, to receive, possess and process for release or transfer such by product material as may be produced by the Duke Training and Technology Center.

C. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or thereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility at a reactor core full steady state power level of 3469 megawatts thermal (100%).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 261 are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

(3) Updated Final Safety Analysis Report

The Updated Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on December 16, 2002, describes certain future activities to be completed before the period of extended operation. Duke shall complete these activities no later than March 3, 2023, and shall notify the NRC in writing when implementation of these activities is complete and can be verified by NRC inspection.

The Updated Final Safety Analysis Report supplement as revised on December 16, 2002, described above, shall be included in the next scheduled update to the Updated Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following issuance of this renewed operating license. Until that update is complete, Duke may make changes to the programs described in such supplement without prior Commission approval, provided that Duke evaluates each such change pursuant to the criteria set forth in 10 CFR 50.59, and otherwise complies with the requirements in that section.

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS — Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

---NOTE---
In MODE 3, both safety injection (SI) pump or RHR pump flow paths may be isolated by closing the isolation valves for up to 2 hours to perform pressure isolation valve testing per SR 3.4.14.1.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more trains inoperable. AND At least 100% of the ECCS flow equivalent to a single OPERABLE ECCS train available.	A.1 Restore train(s) to OPERABLE status.	72 hours*†
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 4.	6 hours 12 hours

---NOTE---
*'A' Train ECCS is allowed to be inoperable for a total of 14 days for the correction of a degraded condition on the 'A' Train supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity, or by March 1, 2017, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. 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. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-16-005.

† For Unit 1 only, the Completion Time for Required Action A.1 may be extended one-time to 10 days during the 1A RHR AHU repair evolution and is contingent on meeting the compensatory measures described in MNS correspondence letter MNS-15-093. Upon completion of the repair evolution, this footnote is no longer applicable and will expire on March 31, 2016.

3.6 CONTAINMENT SYSTEMS

3.6.6 Containment Spray System

LCO 3.6.6 Two containment spray trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One containment spray train inoperable.	A.1 Restore containment spray train to OPERABLE status.	72 hours*
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 84 hours

----------NOTE----------

* 'A' Train Containment Spray is allowed to be inoperable for a total of 14 days for the correction of a degraded condition on the 'A' Train supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity, or by March 1, 2017, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. 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. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-16-005.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.6.1	Verify each containment spray manual and power operated valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.5 Auxiliary Feedwater (AFW) System

LCO 3.7.5 Three AFW trains shall be OPERABLE.

---NOTE---
Only one AFW train, which includes a motor driven pump, is required to be OPERABLE in MODE 4.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

---NOTE---
LCO 3.0.4.b is not applicable when entering MODE 1.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One steam supply to turbine driven AFW pump inoperable.	A.1 Restore steam supply to OPERABLE status.	7 days AND 10 days from discovery of failure to meet the LCO
B. One AFW train inoperable in MODE 1, 2 or 3 for reasons other than Condition A.	B.1 Restore AFW train to OPERABLE status.	72 hours* AND 10 days from discovery of failure to meet the LCO

(continued)

SURVEILLANCE REQUIREMENTS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time for Condition A or B not met. OR Two AFW trains inoperable in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2 Be in MODE 4.	6 hours 12 hours
D. Three AFW trains inoperable in MODE 1, 2, or 3.	D.1 ----------NOTE---------- LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status. ---------- Initiate action to restore one AFW train to OPERABLE status.	 Immediately
E. Required AFW train inoperable in MODE 4.	E.1 Initiate action to restore AFW train to OPERABLE status.	Immediately

----------NOTE----------

* 'A' Train AFW is allowed to be inoperable for a total of 14 days for the correction of a degraded condition on the 'A' Train supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity, or by March 1, 2017, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. 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. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-16-005.

3.7 PLANT SYSTEMS

3.7.6 Component Cooling Water (CCW) System

LCO 3.7.6 Two CCW trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CCW train inoperable.	A.1 ----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops — MODE 4," for residual heat removal loops made inoperable by CCW. ---------- Restore CCW train to OPERABLE status.	72 hours*
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

----------NOTE----------

* 'A' Train CCW is allowed to be inoperable for a total of 14 days for the correction of a degraded condition on the 'A' Train supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity, or by March 1, 2017, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. 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. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-16-005.

ACTIONS (continued)
3.7 PLANT SYSTEMS

3.7.7 Nuclear Service Water System (NSWS)

LCO 3.7.7 Two NSWS trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One NSWS train inoperable.	A.1 ----------NOTES---------- 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources— Operating," for emergency diesel generator made inoperable by NSWS. 2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops—MODE 4," for residual heat removal loops made inoperable by NSWS. ---------- Restore NSWS train to OPERABLE status.	72 hours*
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	6 hours 36 hours

ACTIONS (continued)

----------NOTE----------

* 'A' Train NSWS is allowed to be inoperable for a total of 14 days for the correction of a degraded condition on the 'A' Train supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity, or by March 1, 2017, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. 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. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-16-005.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.7.1	----------NOTE---------- Isolation of NSWS flow to individual components does not render the NSWS inoperable. ---------- Verify each NSWS manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.7.2	Verify each NSWS automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.7.3	Verify each NSWS pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.9 Control Room Area Ventilation System (CRAVS)

LCO 3.7.9 Two CRAVS trains shall be OPERABLE.

----------NOTE----------
The control room envelope (CRE) boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,
During movement of irradiated fuel assemblies,
During CORE ALTERATIONS.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CRAVS train inoperable for reasons other than Condition B.	A.1 Restore CRAVS train to OPERABLE status.	7 days*
B. One or more CRAVS trains inoperable due to inoperable CRE boundary in MODE 1,2,3, or 4.	B.1 Initiate action to implement mitigating actions. AND B.2 Verify mitigating actions ensure CRE occupant exposures to radiological, chemical, and smoke hazards will not exceed limits. AND B.3 Restore CRE boundary to OPERABLE status.	Immediately 24 hours 90 days
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. One or more CRAVS train(s) heater inoperable.	G.1 Restore CRAVS train(s) heater to OPERABLE status. OR G.2 Initiate action in accordance with Specification 5.6.6.	7 days 7 days

----------NOTE----------

* 'A' Train CRAVS is allowed to be inoperable for a total of 14 days for the correction of a degraded condition on the 'A' Train supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity, or by March 1, 2017, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. 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. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-16-005.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Operate each CRAVS train for ≥ 10 continuous hours with the heaters operating.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.2	Perform required CRAVS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.9.3	Verify each CRAVS train actuates on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.4	Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

3.7 PLANT SYSTEMS

3.7.11 Auxiliary Building Filtered Ventilation Exhaust System (ABFVES)

LCO 3.7.11 Two ABFVES shall be OPERABLE.

----------NOTE----------
The Auxiliary Building pressure boundary may be opened intermittently under administrative controls.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One ABFVES inoperable.	A.1 Restore ABFVES to OPERABLE status.	7 days*
B. Two ABFVES inoperable.	B.1 Restore one ABFVES to OPERABLE status.	24 hours
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

----------NOTE----------
* 'A' Train ABFVES is allowed to be inoperable for a total of 14 days for the correction of a degraded condition on the 'A' Train supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity, or by March 1, 2017, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. 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. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-16-005.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Restore DG to OPERABLE status.	72 hours *,** AND 6 days from discovery of failure to meet LCO *
C. Two offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s)
	AND	
	C.2 Restore one offsite circuit to OPERABLE status.	24 hours

(continued)

* For Unit 1 only, the Completion Time that the 1A EDG can be inoperable as specified by Required Action B.4 may be extended beyond the "72 hours and 6 days from discovery of failure to meet the LCO" up to a total of 10 days as part of the 1A EDG Jacket/Intercooler Water Pump Motor repair. Upon completion of the repair and restoration, this footnote is no longer applicable and will expire at 1741 hours on June 15, 2007.

** 'A' Train EDGs are allowed to be inoperable for a total of 14 days for the correction of a degraded condition on the 'A' Train supply piping from the Standby Nuclear Service Water Pond (SNSWP). The 14 days may be taken consecutively or in parts until completion of the activity, or by March 1, 2017, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. 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. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-16-005.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 282 TO RENEWED FACILITY OPERATING LICENSE NPF-9

AND

AMENDMENT NO. 261 TO RENEWED FACILITY OPERATING LICENSE NPF-17

DUKE ENERGY CAROLINAS, LLC

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-369 AND 50-370

1.0 INTRODUCTION

By application dated June 30, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15191A025), as supplemented by letters dated August 11, 2015 (ADAMS Accession No. ML15247A066), September 24, 2015 (ADAMS Accession No, ML15275A155), October 8, 2015 (ADAMS Accession No, ML15313A174), December 7, 2015 (ADAMS Accession No. ML15343A012), February 10, 2016 (ADAMS Accession No. ML16047A383), and February 25, 2016 (ADAMS Accession No. ML16064A239), Duke Energy Carolinas, LLC (Duke, the licensee), requested changes to the Technical Specifications (TSs) for the McGuire Nuclear Station, Units 1 and 2 (MNS 1 and 2). The request would modify selected Technical Specification Completion Times to support repair activity associated with the Nuclear Service Water System (NSWS), Train 'A'. Specifically, 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, ECCS [Emergency Core Cooling System] - 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.

Train 'A' of the shared NSWS would be inoperable while the safety-related supply from the MNS Standby Nuclear Service Water Pond (SNSWP) was isolated to correct a degraded condition affecting that line. However, Duke Energy indicated that it will maintain Train 'A' of the NSWS functional and in operation using the low level intake supply from Lake Norman.

The supplements dated August 11, 2015, September 24, 2015, October 8, 2015, December 7, 2015, February 10, 2016, and February 25, 2016, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published the *Federal Register* on August 20, 2015 (80 FR 50663).

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.36(c) requires that each Operating License issued by the Commission contain TSs that include limiting conditions for operation, which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. 10 CFR 50.36(c)(2) requires that when a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met.

Guidance for NRC staff review of TSs is contained in Section 16.0, "Technical Specifications," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition." The NRC staff has prepared Standard Technical Specifications (STS) for each of the light–water reactor nuclear steam supply systems and associated balance–of–plant equipment systems. The guidance specifies that the staff review whether content and format are consistent with the applicable STS. Where TS provisions depart from the reference TSs, the NRC staff determines whether proposed differences are justified by uniqueness in plant design or other considerations.

The applicable STS for MNS are contained in NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," Revision 4.0. The completion time allowed by STS 3.7.8, "Service Water System (SWS)," to restore one inoperable train of the SWS to service is 72 hours. The 72-hour completion time is based on the capabilities provided by the operable train and the low probability of a design basis accident occurring during this time period.

Plant configuration changes associated with maintenance activities can affect the operational safety of the facility. As such, and to ensure an adequate level of safety is maintained, 10 CFR 50.65(a)(4) requires licensees to assess and manage the increase in risk that may result from the proposed maintenance activities. The scope of this assessment may be limited to SSCs that a risk-informed evaluation process has shown to be significant to public health and safety.

In Regulatory Guide (RG) 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 3 (ADAMS Accession No. ML113610098), the NRC staff endorsed Nuclear Management and Resources Council (NUMARC) 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 4A (ADAMS Accession No. ML11116A198), as providing methods acceptable to the NRC staff for implementing the requirements of 10 CFR 50.65. These guidelines state that the required assessment should consider the following:

- TSs requirements
- The degree of redundancy available for performance of the safety function(s) served by the out-of-service SSC
- The duration of the out-of-service or testing condition
- The likelihood of an initiating event or accident that would require the performance of the affected safety function
- The likelihood that the maintenance activity will significantly increase the frequency of a risk-significant initiating event
- Component and system dependencies that are affected
- Significant performance issues for the in-service redundant SSCs

Normal work controls are adequate to manage nominal increases in risk associated with maintenance activities. Activities to manage more significant increases in risk associated with maintenance activities include measures to increase risk awareness; actions that reduce the duration of maintenance; and actions to minimize the magnitude of the risk increase. Actions to minimize the increase in risk include minimizing other work that could affect the frequency of initiating events, minimizing work in other areas affecting equipment that can accomplish the safety function of the out-of-service SSC, and establishing alternate success paths for affected safety functions.

3.0 TECHNICAL EVALUATION

3.1 System Description

MNS is served by its normal heat sink, Lake Norman, and a separate ultimate heat sink, the SNSWP. Lake Norman is formed by the Cowan's Ford Dam on the Catawba River and provides the normal source of water to the NSWS. The Cowan's Ford Dam is only qualified for an Operating Basis Earthquake (OBE), and, therefore, Lake Norman is not credited to perform the heat sink function for more severe postulated seismic events including the Safe-Shutdown Earthquake (SSE). The SNSWP is qualified for an SSE, and serves as the ultimate heat sink for the more severe postulated events. Nevertheless, Duke completed a seismic fragility assessment of the low-level-intake from Lake Norman to the NSWS, which found that the Cowan's Ford Dam and the low level intake piping would withstand the SSE.

Section 9.2.1 of the MNS Updated Final Safety Analysis Report (UFSAR) indicates that the NSWS provides an assured source of cooling water for various Auxiliary Building and Reactor Building heat exchangers during all phases of station operation. The NSWS is designed to provide adequate cooling water flow to serve essential heat exchangers under normal operating conditions, following anticipated operational occurrences that may require both units to shut down, and for accidents affecting one unit while the other unit completes a shutdown. The system design accommodates these performance requirements assuming a single failure.

The system is divided into two essential headers (one for each train) within each unit, and each header provides cooling water to essential equipment necessary for station safe shutdown or accident mitigation. The system also supplies cooling water through an additional header in each unit to non-essential equipment. The system is divided into four sections: the supply section, the strainer and pump section, the heat exchanger section, and the return section.

The supply section of each train includes suction piping allowing water to be drawn from either the low-level-intake in the normal heat sink (Lake Norman); Lake Norman via the condenser cooling water system; or train-specific suction lines from the SNSWP. The supply section piping is at a lower elevation than the surface elevation of both Lake Norman and the SNSWP. The impoundment forming the SNSWP is designed to remain functional following the SSE, and the redundant supply lines from the SNSWP ensure this source is available to at least one train per unit following a single component failure.

The strainer and pump section of each train in each unit contains a self-cleaning strainer and a horizontal motor-driven pump. The strainer removes foreign material that could clog or degrade water flow to the components served by the SWS. The pump delivers the necessary cooling water to essential components in the train and to the shared non-essential service water header.

Both the low level intake from Lake Norman and the SNSWP have protection against macro-fouling by fish. The low level intake approach velocity is low, and a macro-fouling barrier consisting of a stainless steel mesh covers the inlet. Macro-fouling protection for the SNSWP originally was based only on fish population control measures. However, in 2011, MNS experienced fouling of the NSWS strainers during pump testing using water drawn from the SNSWP (Licensee Event Report 05000369/2011-001-01, ADAMS Accession No. ML111020305). Corrective actions following this event included installation of macro-fouling barriers over the SNSWP suction lines, improvements to the NSWS strainer backwash capability, increased frequency of SNSWP treatment for fish population control, and hydro-acoustic surveys of SNSWP fish populations.

The heat exchanger section directs a supply of cooling water to the following components served by the essential header in each train:

1. Coolers for:

    a. Component Cooling Pump Motors
    b. Centrifugal Charging Pump Motors
    c. Safety Injection Pump Motors
    d. Residual Heat Removal Pump Motors
    e. Containment Spray Pump Motors
    f. Nuclear Service Water Pump Motors
    g. Auxiliary Feedwater (AFW) Pump Motors
    h. Fuel Pool Cooling Pump Motors

2. Containment Spray Heat Exchangers
3. Emergency Diesel Generator (EDG) Heat Exchangers
4. Component Cooling Heat Exchangers
5. Centrifugal Charging Pump Bearing Oil Coolers
6. Centrifugal Charging Pump Gear Oil Coolers
7. Safety Injection Pump Bearing Oil Coolers
8. Control Room Area Chilled Water System Chiller Condensers

In addition, each train provides an assured supply of water to the AFW system in the event the normal supply of condensate is lost, an assured supply of makeup water to the component cooling system expansion tank, and an assured supply of makeup water to the spent fuel pool. The non-essential header in each unit provides cooling to the following components:

- Reciprocating Charging Pump Coolers
- Reactor Coolant Pump Motor Coolers
- Upper Containment Ventilation Units
- Lower Containment Ventilation Units
- Auxiliary Building Ventilation Units

At several points in the NSWS, cross-connect lines allow water flow between trains. The suction lines include provisions to cross-connect the trains, which could allow a single SNSWP suction line to provide water to both NSWS trains. Similarly, a discharge train cross-connect allows either train to supply the heat exchangers served by the non-essential header and provide flow to the opposite train. These discharge cross-connects are normally open to allow one NSWS pump per unit to maintain pressure and flow in both essential headers and the non-essential header. Both the main suction and discharge cross-connect lines are provided with redundant valves with electric motor actuators that assure train isolation in the event of a malfunction. A third cross-connect line at the pump discharge allows crossover flow between trains and between units. This crossover is normally isolated by closed manual valves.

The discharge section normally returns water to Lake Norman through the condenser cooling water system return. Train 'B' would be aligned to return to the SNSWP if that train's supply section had been automatically aligned to the SNSWP. The 'A' train provides redundant capability to return water to the SNSWP, which is necessary if that source has been aligned to the 'A' train supply section.

The following actions occur in the event of a loss-of-offsite power or an engineered safety feature (ESF) safety injection (SI) signal:

- automatic start of the redundant train of NSWS equipment
- automatic separation of the essential trains
- initiation of cooling water flow to the EDG heat exchangers and certain essential coolers
- isolation from the non-seismic condenser cooling water supply piping
- alignment of the Train 'A' supply to the low level intake from Lake Norman and the Train 'B' supply to the SNSWP

The ESF SI signal causes the isolation of a portion of the non-essential header such that the non-essential reactor coolant pump coolers and containment air coolers continue to receive cooling water flow from Train 'A'. The ESF containment high-high pressure signal isolates cooling water flow to the non-essential reactor coolant pump coolers and containment air coolers at the containment penetration.

3.2 Amendment Scope

Through testing, the licensee identified a significantly greater head loss in the SNSWP supply line to Train 'A' components compared to the head loss in the supply line to Train "B." The licensee believes that this condition has existed since initial commercial operation of the facility and is likely a construction issue. Based on the stability of the pressure differential, the licensee has considered Train 'A' operable but degraded and non-conforming. The SNSWP supply to Train 'A' is necessary for full operability of the train because the low level intake from Lake Norman is not qualified to remain operable following a seismic event greater in magnitude than the OBE or another event resulting in loss of the Cowan's Ford Dam. To allow completion of the inspection, potential repairs, and associated testing of the SNSWP supply line to Train 'A' without an unnecessary shutdown of both MNS Units, Duke Energy proposed a one-time limited duration extension of the TS Required Action Completion Time associated with Train 'A' of the NSWS being inoperable with a drained and isolated supply line from the SNSWP. The requested extension would allow continued operation of both Units for a 14 day period while inspection, repairs, and related testing of the Train 'A' supply line from the SNSWP are completed.

To date, the licensee completed a number of actions to characterize the obstruction prior to the submission of this license amendment request (LAR). The NSWS piping from the SNSWP to the Train "A" pumps is approximately 2000 feet long. Visual inspection by divers, acoustic reflectometry, and Remotely Operated Vehicle (ROV) inspection indicated the obstruction was far downstream from the suction from the SNSWP. The licensee determined that a new manway was necessary in a location closer to the area to be inspected to allow for safe and reliable completion of the inspection. The licensee installed this manway in the plant yard shortly before submitting the LAR. The licensee planned to complete an ROV inspection of the remaining NSWS piping that was not safely accessible by ROV from the SNSWP suction opening using this new manway for access. The licensee stated that this ROV inspection would be performed subject to the existing provisions of TS 3.7.7, which would allow a 72-hour period for completion of the inspection and return of the Train "A" NSWS suction piping to an operable condition.

The licensee proposed the amendment for a 14-day completion time to support the removal of any obstruction identified in the ROV inspection, completion of minor repairs to the piping, restoration of the NSWS, and post-maintenance testing of the NSWS. Although the remaining suction piping included a section under the Unit 2 EDG Building that the licensee considered a likely location for any obstruction, the scope of the proposed activity would not allow for major excavation or activities that would adversely affect other safety-related Structures, Systems, and Components (SSCs). The licensee requested use of the 14-day completion time either consecutively or in parts, with the allowance expiring at the completion of the activity or on March 1, 2017, whichever occurs first.[1]

If the obstruction cannot be safely removed by divers, the licensee proposed to fully isolate and drain the SNSWP suction line Train "A" piping while maintaining flow through the Lake Norman Low-Level Intake to the Train "A" NSWS pumps. The SNSWP section of the Train "A" suction

1 The licensee's original submittal proposed an ultimate end date of December 31, 2016, however, due to the length of the review time, the licensee, in its February 24, 2016, supplement, requested to adjust the end date to March 1, 2017.

piping would be separated from the Low-Level Intake piping by closing NSWS valve 0RN-7A between the two piping sections. The SNSWP suction piping would be drained by displacing the water with pressurized air and installation of a blank flange over the suction from the SNSWP. If required for the removal of the obstruction and repair of the piping, the licensee planned to access the drained Train "A" SNSWP suction piping through an additional manway proposed for installation in the MNS auxiliary building adjacent to valve 0RN-7A.

The LAR included information indicating the manway 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 licensee stated that the SNSWP water source would be isolated by the installation of a bolted blank flange and the Lake Norman water source would be isolated by closure of valve 0RN-7A. The MNS UFSAR included information indicating the auxiliary building is a Category 1 structure that is sealed to provide protection against external flooding. Control of valve 0RN-7A in the closed position would therefore be used to limit the potential for water ingress and prevent flooding of the auxiliary building from Lake Norman during the period when the additional manway in the auxiliary building was open. The licensee provided an isometric diagram depicting the configuration of the suction supply section of the MNS NSWS and the location of key components in Attachment 4 to the LAR.

3.3 Change in Completion Time Allowance

The existing TS 3.7.7 Limiting Condition for Operation (LCO) for the MNS NSWS requires two NSWS trains to be operable in Modes 1, 2, 3, and 4 (power operation, startup, hot standby, and hot shutdown, respectively). Condition A of MNS TS 3.7.7 applies to one inoperable NSWS train, and requires restoration of the inoperable train to operable status within 72 hours. In addition, TS 3.7.7 Condition A requires entry into the TS 3.8.1 Condition B, which applies to one inoperable EDG, and any TS 3.4.6 condition becoming applicable as a result of a residual heat removal loop being inoperable due to the NSWS condition in operational Mode 4, hot shutdown. These are exceptions to MNS TS LCO 3.0.6, which states in part:

> When a supported system LCO is not met solely due to a support system LCO not being met, the Conditions and Required Actions associated with this supported system are not required to be entered. Only the support system LCO ACTIONS are required to be entered.

The reference to TS LCO 3.8.1 ensures appropriate actions are taken for an inoperable EDG. The licensee does not expect either MNS unit to enter operational Mode 4 during the NSWS repair, so the licensee does not expect entry into TS LCO 3.4.6.

As noted above, Duke proposed to complete additional characterization of the flow restriction in the Train 'A' suction supply from the SNSWP using the 72-hour completion time permitted by MNS TS 3.7.7 for one inoperable NSWS train. This characterization would involve use of a ROV introduced into the NSWS suction piping through the yard manway. The results of the characterization efforts would be used to inform the subsequent activities.

The licensee anticipates that the activities involved in correcting the degraded condition would significantly exceed the 72-hour completion time permitted by MNS TS 3.7.7. The licensee identified the following expected major activities:

- Remove the "A" train of NSWS suction header from service
- Safety tag out of the "A" train of NSWS suction piping
- Stage equipment supporting personnel access to suction header
- If necessary for access, install auxiliary building manway
- Establish services for removal and repair of blockage
- Remove blockage and repair piping
- Complete inspections for acceptance of repair and for removal of foreign material
- Restore system boundary
- Clear equipment tag out and complete filling and venting of suction supply header
- Complete system testing and return to service

The "A" Train of the NSWS would become inoperable when the suction supply line from the SNSWP is removed from service.

To support the extended period of time necessary to complete these activities, the licensee proposed a one-time change to the MNS TSs. The proposed change to TS 3.7.7, as documented in Attachment 1 to the LAR, added an asterisk to the 72-hour completion time for one NSWS train inoperable and added the following note:

> * 'A' Train NSWS is allowed to be inoperable for a total of 14 days for correction of a degraded condition on the 'A' Train NSWS supply piping from the SNSWP. The 14 days may be taken consecutively or in parts until completion of the activity or by December 31, 2016, whichever occurs first. During the period in which the 'A' Train NSWS supply piping from the SNSWP is not available, the 'A' Train NSWS will remain aligned to Lake Norman until the system is ready for post maintenance testing. Any maintenance that is performed on the remaining portions of 'A' Train NSWS during the period in which the 'A' Train NSWS from the SNSWP supply piping is not available will be limited to a 72 hour completion time. The latter will not count against the 14 day completion time. Allowance of the extended Completion Time is contingent on meeting the Compensatory Measures and Commitments described in MNS LAR submittal correspondence letter MNS-15-026.

As noted previously, the licensee subsequently proposed to modify the ultimate end date to March 1, 2017, commensurate with length of the review time of the LAR.

The NRC staff requested additional information that resulted in the licensee proposing more stringent compensatory measures and commitments[2] in later supplements. The NRC staff has based this evaluation on the list of regulatory commitments provided in Attachment 1 to the letter dated February 10, 2016, which provided Duke's clarification of its response to the last staff request for additional information. Additionally, Duke stated that the TS note would be updated to represent the final regulatory commitments provided in that letter.

2 Although referred to as "commitments" by the licensee, the actions are incorporated by reference into the proposed TS footnote and, as such, are licensee obligations.

To clearly indicate the status of supported systems while using the extended completion time for 'A' Train NSWS repairs, the amendment request included changes to the TSs for the following systems:

- TS 3.5.2 Emergency Core Cooling System
- TS 3.6.6 Containment Spray System
- TS 3.7.5 Auxiliary Feedwater System
- TS 3.7.6 Component Cooling Water
- TS 3.7.9 Control Room Area Ventilation System (CRAVS)
- TS 3.7.11 Auxiliary Building Filtered Ventilation Exhaust System
- TS 3.8.1 AC Sources - Operating

For each of the above systems, the completion time to restore an inoperable train or component EDG to operable status would be modified by a note. The note was identical to the note added to TS 3.7.7 for the NSWS, except the first sentence identified the specific 'A' Train system or component for which the completion time was extended. Thus, during the correction of the degraded condition in the 'A' Train suction piping from the SNSWP, the TS changes would extend the completion time to 14 days to restore the affected 'A' Train or component to operable status. The inoperable 'A' Train of the NSWS would also affect TS 3.7.10, "Control Room Area Chilled Water System (CRACWS)," but the specified completion time for one inoperable CRACWS train in TS 3.7.10 (30 days) exceeds the requested 14-day completion time and, thus, no change to TS 3.7.10 is necessary.

The NRC staff evaluated whether the proposed changes to the MNS TSs were justified by unique features of the design and other considerations applicable to the repair activity. As specified in the TS change, the licensee will maintain the "A" Train of the NSWS in service by aligning the suction supply to the Low-Level Intake from Lake Norman, which is the alignment that would result from an engineered safety features actuation signal. In this configuration, the 'A' Train of the NSWS would be capable of satisfying all design requirements except for a seismic event exceeding the OBE or another event resulting in loss of the Cowan's Ford Dam. For those initiating events, the design basis credits operator remote realignment of the 'A' Train NSWS suction to the SNSWP to maintain one operable NSWS train when an assumed single failure affects the 'B' Train of the NSWS. These two design-basis initiating events that would affect the 'A' Train NSWS supply represent a small fraction of the spectrum of design-basis initiating events that rely on the NSWS to prevent or mitigate the potential consequences of those events. Furthermore, the licensee has evaluated the structural integrity of the Cowan's Ford Dam and the Low Level Intake piping and determined that these structures have substantial margin above the design conditions, which reduces the likelihood that the initiating events would challenge the availability of the Low Level Intake. Nevertheless, for a loss of the Low Level Intake, the licensee has procedures and, as a compensatory measure, will maintain designated operators to execute manual actions to align an affected unit's 'A' Train NSWS pump to the 'B' Train suction supply from the SNSWP via the main supply crossover piping. Thus, the proposed configuration of the NSWS and operational considerations that support reliable realignment of the 'A' Train NSWS to the 'B' Train supply from the SNSWP would result in only a minimal change in the reliability of the NSWS to perform its design functions during the proposed maintenance activities.

The changes to TSs 3.5.2, 3.6.6, 3.7.5, 3.7.6, 3.7.9, 3.7.11, and 3.8.1 extend the allowed completion times for support system inoperability resulting from the NSWS repair activity. Since the proposed completion time extension is explicitly linked to inoperability resulting from the NSWS repair activities, the same unique design features and operational considerations that maintain the reliability of the NSWS design function contribute to the continued reliability of the design functions provided by the supported systems. Other causes of inoperability for the supported systems would cause entry into the appropriate permanent LCO condition with its shorter allowed completion time.

Based on the above, the NRC staff concluded that the temporary increase to a 14-day allowed completion time for an inoperable NSWS train during 'A' Train repair activities would be appropriate because the affected NSWS train would remain functional and few postulated initiating events would threaten that capability. The proposed TS changes applied only to inoperable conditions resulting from the NSWS repair activities, so the increase in completion time would not apply to other causes of inoperability that could result in a more substantial increase in risk. As discussed in Section 3.4 of this SE, the NRC staff finds that the proposed temporary changes to the MNS TSs, considering the specific design features of the facility combined with the compensatory actions that will be implemented during the associated repair activity appropriately minimize the risk associated with an extension in the allowed completion time. As such, the proposed temporary changes represent appropriate remedial actions while facilitating repair to the facility. The proposed change is consistent with the guidance contained in Section 16.0 of NUREG-0800 and is, therefore, acceptable.

3.4 Assessment and Management of Maintenance-Related Configuration Changes

The licensee proposed a number of compensatory actions to manage the added risk associated with the maintenance activities. The added risk primarily would result from changes in the NSWS configuration during the maintenance activities and a planned contingency to install a manway through the NSWS pressure boundary in the Auxiliary Building to support repair activities. The commitments to manage risk may be classified into categories of work controls, actions to minimize initiating event frequency, actions to control events affecting redundant equipment, and actions to provide alternate success paths for essential functions.

3.4.1 NSWS Configuration Changes

To support the NSWS repair, the licensee plans to isolate the suction piping for the 'A' Train from the SNSWP by installing a blank flange at the SNSWP suction inlet and closing NSWS valve 0RN-7A. During the repair activities, the licensee will maintain the 'A' Train of the NSWS in operation with the suction aligned to the Low-Level Intake from Lake Norman, which is the ESF alignment for the 'A' Train suction supply piping, until the system is ready for post-maintenance testing. The licensee will also align the suction for the 'B' Train of the NSWS to the SNSWP, which is the ESF alignment for the 'B' Train supply piping. In this configuration, the NSWS would be capable of providing full design flow to all essential systems and components provided that the Low-Level Intake remains available (i.e., all events except postulated seismic events). To ensure the reliability of the NSWS and minimize potential challenges to system safety functions, the licensee will implement compensatory actions discussed in more detail in this section (3.4).

3.4.2 Work Controls

The licensee stated that it will control the work activities under Duke's work management procedures as an infrequently performed test or evolution. In addition, the licensee stated that it would terminate repair activities and restore the system to operable but degraded or non-conforming condition if characterization of the repair activities indicated the repairs could not be completed within 14 days or if repairs could affect the ability of a SSC to perform its safety function.

The licensee described controls on the scope of pre-planned work to ensure safety functions could be reliably performed. The licensee stated that it would perform no discretionary maintenance affecting the 'A' Train EDGs and the portion of the 'A' Train of the NSWS unaffected by the supply piping repair activities and, in addition, would perform no discretionary maintenance on the 'B' Train of the NSWS and the following systems supported by the NSWS:

- ECCS,
- CSS,
- AFW system,
- CCW system,
- control room ventilation system,
- auxiliary building ventilation system, and
- EDGs.

The licensee identified this 'B' Train equipment as protected under the facility's work control process. The licensee's work control compensatory actions referred to in this section are included in letter MNS-16-005, and are incorporated into the new TS footnotes. Accordingly, they are binding on the licensee. On this basis, the NRC staff finds these compensatory actions to be properly controlled and, thus, acceptable.

3.4.3 Minimizing Initiating Event Frequency

The licensee will implement administrative controls to minimize the probability of initiating events that could either degrade the NSWS or affect its function. These measures include: limiting the air pressure used to displace water from the SNSWP supply piping to ensure no air intrudes into the operating NSWS piping, scheduling the repair activities during periods where the likelihood of severe weather is reduced, and evaluating the conditions in Lake Norman to ensure the probability of macro-fouling via the Low-Level Intake is low.

3.4.4 Control of Work in other Areas

The licensee stated that it will protect certain SSCs from discretionary maintenance that could affect the reliability of these SSCs. These SSCs included the Standby Shutdown Facility (SSF) and the switchyard and other locations affecting offsite power sources. The licensee also identified the SSF and associated systems that support the SSF function for each unit (i.e., the standby makeup water pumps, the turbine-driven AFW pumps, and the containment ventilation cooling water system) as protected under the facility's work control process. The SSF provides an alternate and independent means to achieve a hot standby condition and maintain the hot

standby condition for up to 72 hours. The SSF was not qualified to withstand seismic events such as the SSE, but it is capable of performing its function independent of the NSWS provided that the normal source of condensate for the turbine-driven AFW pump is available.

3.4.5 Alternate Success Paths

The licensee stated that it will maintain alternate methods to accomplish certain essential functions. These measures involve both actions to respond to events affecting the NSWS and other capabilities that could be impacted by the NSWS maintenance evolution. Specifically, the licensee will maintain procedures and dedicated personnel to provide the 'A' Train supply piping with water from the SNSWP via the 'B" Train suction line and the main supply cross-connect. In addition to measures taken specifically for the maintenance evolution, the licensee also stated that the SSF and diverse and flexible coping strategies (FLEX) implemented pursuant to NRC Order EA-12-049 "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events," would be available to provide alternate means of completing certain key safety functions. The SSF provides an alternate and independent means to achieve a hot standby condition and maintain the hot standby condition for up to 72 hours. Although the SSF is not qualified to withstand seismic events such as the SSE, it is capable of performing its function independent of the NSWS provided that the normal source of condensate for the turbine-driven AFW pump is available. The primary objective of FLEX is to provide a capability to cope with a simultaneous extended loss of alternating current power and loss of ultimate heat sink (e.g., loss of the NSWS) for an indefinite period through a combination of installed plant capability, portable on-site equipment, and off-site resources. By letter dated December 7, 2015, Duke Energy notified the NRC of full compliance with Order EA-12-049 (ADAMS Accession No. ML15343A010), thus, the entirety of these resources would be available during the NSWS maintenance.

3.4.6 NRC Staff Evaluation

As described above, the NRC staff finds that the licensee has developed appropriate risk management measures for the modified NSWS configuration during the proposed repair activities. The identified work controls ensure that the NSWS will retain its functional capability for all but a small fraction of potential design basis events. The licensee has also developed appropriate measures to minimize the likelihood that proposed activities associated with the repair, maintenance activities, or external conditions would threaten the reliability of the NSWS. Finally, the licensee committed to maintain procedures to establish an alternate NSWS configuration that would maintain acceptable cooling for the unlikely condition where normal cooling water flow from Lake Norman through the Low Level Intake is lost and a single failure affects the ability of the 'B' Train to deliver flow to necessary heat exchangers. Further, the NRC staff finds that these measures are consistent with the industry guidelines in NUMARC 93-01, which the NRC has endorsed as an acceptable method for compliance with the requirements of 10 CFR 50.65(a)(4). Therefore, the licensee's proposed management of the risk increase associated with the NSWS configuration to support maintenance is acceptable. Additionally, these measures demonstrate that proposed footnotes are acceptable remedial actions for when the LCO is not met and, thus, meet 10 CFR 50.36(c)(2).

3.5 NSWS Pressure Boundary Changes

To support the NSWS repair activity, the licensee proposed a contingency action to install a new manway for access to the SNSWP suction piping from within the auxiliary building. If additional access is required for the repair, the licensee will design and install the manway to access the 'A' Train NSWS piping in the auxiliary building in accordance with the licensee's engineering change process. The manway, when closed, would be designed to the same criteria as the NSWS piping and perform the pressure boundary function.

As indicated in the LAR, the manway, when open for personnel access, would create the potential for NSWS leakage into the auxiliary building. To ensure against the potential for significant leakage, the licensee stated that the SNSWP would be isolated by the installation of a bolted flange and the Lake Norman water source would be isolated by closure of valve ORN-7A under administrative and physical controls. As indicated in the MNS UFSAR, the auxiliary building is a Category 1 structure that is sealed to provide protection against external flooding and protection against internal flooding is a design function of the NSWS pressure boundary.

3.5.1 Work Controls

The licensee stated that it would control the work activities to minimize the potential for leakage by valve 0RN-7A. Separate from the 14-day extended completion time, the licensee committed to test valve 0RN-7A for leakage and adjust the valve position if necessary to minimize leakage. The licensee committed to control the configuration of the new manway in the auxiliary building using procedures developed or revised for this purpose. When operating valve 0RN-7A, the licensee stated that it would use its concurrent dual verification process to ensure the correct component position is established. In order to prevent operation of valve 0RN-7A while the manway is open in the auxiliary building, the licensee described the following measures that would be in place to prevent operation or movement of the valve:

- the hand wheel for operation of the valve will be in the closed position and restrained with a lock and tag
- a mechanical stem locking device will be installed on valve 0RN-7A to prevent any movement of the valve disk
- the valve motor operator will be electrically isolated by disconnecting and tagging the output wiring in the 0RN-7A breaker cubicle from the load side of the motor starter, which opens the electrical path from the breaker to the valve motor operator
- a dedicated person will be stationed in the room to monitor for valve leakage and prevent valve operation

These proposed actions will physically restrain the valve disk and provide several barriers to prevent operation or movement of the valve during the period the manway in the auxiliary building would be open.

In addition to minimizing inadvertent manipulation of the valve, the licensee indicated that, were water to leak by, the sump system for the room has the capability to remove 500 gpm. To ensure the availability of dewatering capability, the licensee stated it would designate the

auxiliary building sump in the vicinity of the new manway and the equipment supporting the function of the sump as protected equipment.

3.5.2 Minimizing Initiating Event Frequency

In response to NRC staff requests for additional information, the licensee discussed design features and operating restrictions that help to minimize the potential for events that could initiate excessive leakage past valve 0RN-7A. In the attachments to letters dated September 24, 2015, and December 7, 2015, the licensee reviewed the following events that may produce transients in the NSWS:

- Loss Of Off-site Power (LOOP);
- SI signal; and
- Realignment activities that may be associated with a seismic event.

For a LOOP or SI, the expected flow transient would be minimized because the licensee will have already aligned the NSWS in its post-LOOP/SI configuration throughout the NSWS repair activities. The LOOP transient would result in the running NSWS pumps stopping and restarting following restoration of power by the EDGs. The licensee determined this transient would not be expected to cause a water-hammer event or otherwise challenge the system. Valve 0RN-7A is a safety-related component and is designed to be operated over the range of flow and pressure conditions that could occur during normal and emergency operation, including the isolation of the Low Level Intake piping from Lake Norman. Historical operation of the valve has demonstrated proper operation and function of the valve, including operations that involved isolation of the Lake Norman flow path.

For realignment activities that may follow a seismic event, the licensee indicated that the B Train of NSWS would already be aligned to draw from the SNSWP. Therefore, there would be no need for any realignment or manipulation of valve 0RN-7A.

3.5.3 Control of Work in other Areas

As discussed above, the licensee will protect certain SSCs from discretionary maintenance, such as the SSF and the switchyard. These restrictions serve to minimize the potential for initiating events that challenge the NSWS and increase the likelihood the SSF capabilities supporting safe shutdown to hot standby would be available.

3.5.4 Alternate Success Paths

In addition to minimizing the possibility of leakage past valve 0RN-7A, the licensee described alternate methods to manage leakage past valve 0RN-7A and prevent excessive leakage that would be in place. The location of the proposed auxiliary building manway contains equipment important to safety including the Unit 2 AFW pumps and the Unit 2 auxiliary shutdown panel. This location, however, has the capability to accommodate some water accumulation, which would allow operators significant time to respond to increased leakage. In addition, the licensee has developed procedures to allow isolation of the 'A' Train supply from the Low-Level Intake if excessive leakage develops.

The licensee stated that the equipment located in the area of the manway would be unaffected by flooding up to an elevation of 20 inches above the floor, and the design-basis internal flood elevation in the area of 12 inches above the floor allows for accumulation of approximately 21,000 gallons before the design-basis flood level would be exceeded. In addition, the area drains to the auxiliary building ground water drainage sump, and the sump is equipped with two pumps provided with emergency power supplies that have the capability to remove up to 500 gallons per minute. The licensee expected to establish a leakage limit between 50 and 100 gallons per minute, and excessive leakage up to 700 gallons per minute would allow at least 30 minutes to implement measures to isolate the leakage.

During the maintenance evolution, the licensee will maintain capabilities to respond to excessive leakage during periods when the NSWS manway in the auxiliary building is open. The licensee stated that the following response would be initiated before ORN-7A leakage rate exceeded the predefined acceptable limit and before any significant impact to the plant or equipment in the vicinity of 0RN-7A could occur:

- When the manway is open, dedicated personnel having communication to the main control room will be in place to continuously monitor and respond to 0RN-7A leakage
- If leakage exceeds the predetermined limit, the repair activity will be stopped, the manway would be closed, and the control room would be notified
- If the manway could not be immediately closed in response to excessive leakage, then personnel would perform the following actions to isolate the flowpath from Lake Norman within 15 minutes:

    - Stop the 'A' Train NSWS pumps from the control room;
    - Close valves 0RN-12AC and 0RN-13A from the control room to isolate the flowpath from Lake Norman; and
    - Start the 'B' Train NSWS pumps from the control room (this action would have no impact on A NSWS Train or 0RN-7A)

As indicated in the licensee's submittal, valves 0RN-12AC and ORN-13A are safety-related components designed to be operated over the range of flow and pressure conditions that could occur during normal and emergency operation, including the isolation of the Lake Norman flowpath. Therefore, the NRC staff concludes that the control room operators have a reliable capability to isolate the NSWS 'A' Train if necessary.

In addition to the dedicated operator to monitor for excessive leakage, Duke stated that the existing auxiliary building ground water system alarms would prompt control room operators to take actions in existing procedures including taking the operating NSWS train out of service and entering the plant flooding procedure. The ground water system sump Hi Level alarm provides a computer alarm in the control room and the Hi-Hi Level alarm actuates a control room annunciator with an associated alarm response procedure. As discussed previously, the licensee stated that it would protect the ground water sump and supporting equipment during the maintenance activity, and the ground water system sump level control and alarm functions are subject to inspections in functional checks on a three year period. Therefore, the NRC staff concludes there is reasonable assurance that a reliable method of prompting control room operator isolation of the NSWS 'A' Train piping would be available that is independent of the personnel directly involved with the maintenance activity.

Although the licensee has indicated that the SSF and FLEX capabilities will be available to reduce the risk associated with the maintenance activities, the licensee explained that these alternate shutdown capabilities were intended to respond to a loss of the NSWS rather than excessive leakage events in the auxiliary building. This is understandable because the initial conditions considered in the design of the SSF and FLEX capabilities did not rely on the availability of service water. Nevertheless, the NRC staff finds that licensee's FLEX capabilities could be helpful in providing or augmenting some essential safe shutdown functions in the event of excessive leakage into the auxiliary building.

3.5.5 NRC Staff Evaluation

The NRC staff finds that the licensee has developed appropriate risk management measures for the proposed changes to the NSWS pressure boundary. The identified work controls ensure that the NSWS pressure boundary will be reliably controlled to prevent excess leakage from the NSWS in the auxiliary building. The design and operation of the NSWS provide a high degree of assurance that the integrity of the pressure boundary provided by valve 0RN-7A in the closed position would not be impaired by events that challenge the NSWS, such as a LOOP or seismic event. Finally, the licensee will maintain procedures to respond to the unlikely development of excessive leakage past valve 0RN-7A and, if necessary, to isolate Lake Norman from the 'A' Train NSWS suction piping. Thus, the licensee has proposed compensatory measures consistent with the industry guidelines in NUMARC 93-01, which the NRC has previously endorsed as an acceptable method for compliance with the requirements of 10 CFR 50.65(a)(4). Therefore, the management of the risk increase associated with the NSWS pressure boundary configuration change to support maintenance is acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the North Carolina State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (80 FR 50663). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by

operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor(s): S. Jones
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Date: March 16, 2016

If you have any questions, please call me at 301-415-2481.

Sincerely,

/RA/

G. Edward Miller, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-369 and 50-370

Enclosures:
1. Amendment No. 282 to NPF-9
2. Amendment No. 261 to NPF-17
3. Safety Evaluation

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