



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

February 15, 2018

Mr. Thomas D. Ray  
Vice President  
McGuire Nuclear Station  
Duke Energy Carolinas, LLC  
12700 Hagers Ferry Road  
Huntersville, NC 28078-8985

SUBJECT: MCGUIRE NUCLEAR STATION, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS 308 AND 287 FOR TEMPORARY CHANGES TO TECHNICAL SPECIFICATIONS TO ADDRESS AN 'A' TRAIN NUCLEAR SERVICE WATER NON-CONFORMING CONDITION (CAC NOS. MG0242 AND MG0243; EPID L-2017-LLA-0299)

Dear Mr. Ray:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 308 to Renewed Facility Operating License No. NPF-9 and Amendment No. 287 to Renewed Facility Operating License No. NPF-17 for the McGuire Nuclear Station, Units 1 and 2, respectively. The amendments are in response to your application dated September 14, 2017, as supplemented by letter dated December 12, 2017.

The amendments modify Technical Specification (TS) Completion Times (CTs) to support repair activity associated with the Nuclear Service Water System (NSWS), Train 'A'. Specifically, the amendments would temporarily change the following TSs to allow the inoperability of the 'A' Train of the NSWS for up to 14 days:

- TS 3.5.2, "ECCS [Emergency Core Cooling System] - Operating;"
- TS 3.6.6, "Containment Spray System;"
- 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);"
- TS 3.8.1, "AC [Alternating Current] Sources – Operating."

The amendments will permit the 'A' Train NSWS to be inoperable for a total of 14 days to address a non-conforming condition on the 'A' Train NSWS supply piping from the standby nuclear service water pond (SNSWP). 'A' Train of the shared NSWS would be inoperable while the safety-related supply from the SNSWP was isolated to correct a non-conforming condition affecting that line. However, 'A' Train of the NSWS will be functional and in operation using the low level intake supply from Lake Norman.

T. Ray

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Michael Mahoney', with a long horizontal flourish extending to the right.

Michael Mahoney, 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. 308 to NPF-9
2. Amendment No. 287 to NPF-17
3. Safety Evaluation

cc: 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. 308  
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 Duke Energy Carolinas, LLC (the licensee), dated September 14, 2017, as supplemented by letter dated December 12, 2017, 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.

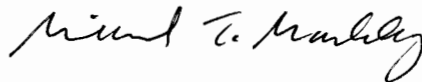
2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-9 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 308, 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 120 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 Renewed License No. NPF-9  
and Technical Specifications

Date of Issuance: February 15, 2018



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. 287  
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 September 14, 2017, as supplemented by letter dated December 12, 2017, 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.

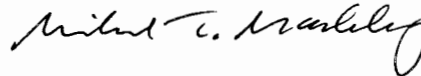
2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-17 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 287, 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 120 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 Renewed License No. NPF-17  
and Technical Specifications

Date of Issuance: February 15, 2018

ATTACHMENT TO  
MCGUIRE NUCLEAR STATION, UNITS 1 AND 2  
LICENSE AMENDMENT NO. 308  
RENEWED FACILITY OPERATING LICENSE NO. NPF-9  
DOCKET NO. 50-369  
  
AND  
LICENSE AMENDMENT NO. 287  
RENEWED FACILITY OPERATING LICENSE NO. NPF-17  
DOCKET NO. 50-370

Replace the following pages of the Renewed Facility Operating Licenses with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

<u>Remove</u>	<u>Insert</u>
NPF-9, page 3	NPF-9, page 3
NPF-17, page 3	NPF-17, page 3

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

<u>Remove</u>	<u>Insert</u>
TS 3.5.2-1	TS 3.5.2-1
TS 3.6.6-1	TS 3.6.6-1
TS 3.7.5-2	TS 3.7.5-2
TS 3.7.6-1	TS 3.7.6-1
TS 3.7.7-2	TS 3.7.7-2
TS 3.7.9-3	TS 3.7.9-3
TS 3.7.11-1	TS 3.7.11-1
TS 3.8.1-3	TS 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. 308, 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 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 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. 287, 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.

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#### ACTIONS

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

-----NOTE-----

\*'A' Train ECCS is allowed to be inoperable for a total of 14 days to address a non-conforming condition on the 'A' Train NSWS 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 31, 2019, 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 described in MNS LAR submittal correspondence letter MNS-17-031.

† 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.	6 hours
	<u>AND</u> B.2 Be in MODE 5.	84 hours

-----NOTE-----  
 \* 'A' Train Containment Spray is allowed to be inoperable for a total of 14 days to address a non-conforming 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 31, 2019, whichever occurs first. During the period in which the 'A' Train NSWWS supply piping from the SNSWP is not available, the 'A' Train NSWWS 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 NSWWS during the period in which the 'A' NSWWS 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 described in MNS LAR submittal correspondence letter MNS-17-031.

#### SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.6.1 -----NOTE----- Not required to be met for system vent flow paths opened under administrative control. ----- 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

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. Required Action and associated Completion Time for Condition A or B not met.</p> <p><u>OR</u></p> <p>Two AFW trains inoperable in MODE 1, 2, or 3.</p>	<p>C.1 Be in MODE 3.</p> <p><u>AND</u></p> <p>C.2 Be in MODE 4.</p>	<p>6 hours</p> <p>12 hours</p>
<p>D. Three AFW trains inoperable in MODE 1, 2, or 3.</p>	<p>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.  -----</p> <p>Initiate action to restore  one AFW train to  OPERABLE status.</p>	<p>Immediately</p>
<p>E. Required AFW train inoperable in MODE 4.</p>	<p>E.1 Initiate action to restore  AFW train to OPERABLE  status.</p>	<p>Immediately</p>

-----NOTE-----

\* 'A' Train AFW is allowed to be inoperable for a total of 14 days to address a non-conforming 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 31, 2019, 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 described in MNS LAR submittal correspondence letter MNS-17-031.

### 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. <u>AND</u> 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 to address a non-conforming 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 31, 2019, 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 described in MNS LAR submittal correspondence letter MNS-17-031.

-----NOTE-----

\* 'A' Train NSWS is allowed to be inoperable for a total of 14 days to address a non-conforming 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 31, 2019, 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 described in MNS LAR submittal correspondence letter MNS-17-031.

**SURVEILLANCE REQUIREMENTS**

SURVEILLANCE	FREQUENCY
<p>SR 3.7.7.1 -----NOTE----- Isolation of NSWS flow to individual components does not render the NSWS inoperable.</p> <p>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.</p>	In accordance with the Surveillance Frequency Control Program
<p>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.</p>	In accordance with the Surveillance Frequency Control Program
<p>SR 3.7.7.3 Verify each NSWS pump starts automatically on an actual or simulated actuation signal.</p>	In accordance with the Surveillance Frequency Control Program

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

-----NOTE-----

\* 'A' Train CRAVS is allowed to be inoperable for a total of 14 days to address a non-conforming 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 31, 2019, 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 described in MNS LAR submittal correspondence letter MNS-17-031.

### 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.  
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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.	6 hours
	<u>AND</u> C.2 Be in MODE 5.	36 hours

-----NOTE-----  
\* 'A' Train ABFVES is allowed to be inoperable for a total of 14 days to address a non-conforming 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 31, 2019, 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 described in MNS LAR submittal correspondence letter MNS-17-031.



ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Restore DG to OPERABLE status.	72 hours **  <u>AND</u>  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.  <u>AND</u>  C.2 Restore one offsite circuit to OPERABLE status.	12 hours from discovery of Condition C concurrent with inoperability of redundant required feature(s)          24 hours

(continued)

-----NOTE-----

\*\* 'A' Train EDGs are allowed to be inoperable for a total of 14 days to address a non-conforming 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 31, 2019, 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 described in MNS LAR submittal correspondence letter MNS-17-031.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO  
AMENDMENT NO. 308 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-9  
AND  
AMENDMENT NO. 287 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-17  
DUKE ENERGY CAROLINAS, LLC  
MCGUIRE NUCLEAR STATION, UNITS 1 AND 2  
DOCKET NOS. 50-369 AND 50-370

1.0 INTRODUCTION

By letter dated September 14, 2017, as supplemented by letter dated December 12, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML17262A090 and ML17349A157, respectively), Duke Energy Carolinas, LLC (Duke Energy, the licensee) submitted an application to change the technical specifications (TSs) for the McGuire Nuclear Station, Units 1 and 2 (McGuire). The supplement dated December 12, 2017, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC or Commission) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on December 19, 2017 (82 FR 60226).

The amendments would modify selected TS Completion Times (CTs) to support repair activity associated with the Nuclear Service Water System (NSWS), Train 'A'. Specifically, the amendments 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;"
- 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);"
- TS 3.8.1, "AC [Alternating Current] Sources – Operating."

The amendments will permit the 'A' Train NSWS to be inoperable for a total of 14 days to address a non-conforming condition on the 'A' Train NSWS supply piping from the standby nuclear service water pond (SNSWP). 'A' Train of the shared NSWS would be inoperable while the safety-related supply from the SNSWP was isolated to correct a non-conforming condition affecting that line. However, 'A' Train of the NSWS will be functional and in operation using the low level intake (LLI) supply from Lake Norman.

## 2.0 REGULATORY EVALUATION

### 2.1 NSWS and Ultimate Heat Sink (UHS) System Descriptions

McGuire is served by a normal heat sink, Lake Norman, and a separate Ultimate Heat Sink (UHS), 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 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 the SSE, and serves as the heat sink for the more severe postulated events.

Section 9.2.1 of McGuire's Updated Final Safety Analysis Report (UFSAR) describes 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 shutdown, 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 NSWS 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 NSWS 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 LLI to 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 service water system (SWS). The pump delivers the necessary cooling water to essential components in the train and to the shared non-essential service water header.

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:
  - Component Cooling Pump Motors
  - Centrifugal Charging Pump Motors
  - Safety Injection Pump Motors
  - Residual Heat Removal Pump Motors Residual Heat Removal Pump Motors
  - Containment Spray Pump Motors
  - Nuclear Service Water Pump Motors
  - Auxiliary Feedwater Pump Motors
  - 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 supplies 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 engineered safety system headers downstream of the NSWS pumps are not qualified for sharing between units.

The discharge section normally returns water to Lake Norman through the condenser cooling water system return. The 'B' Train 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 NSWWS 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 'A' Train supply to the LLI from Lake Norman and the 'B' Train 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 the 'A' Train. 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.

## 2.2 Applicable Regulations and Guidance

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.36 requires that each Operating License issued by the Commission contain TSs that include limiting conditions for operation (LCOs), which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a LCO 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 the NRC staff's review of TSs is contained in Section 16.0, "Technical Specifications," of NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition" (ADAMS Accession No. ML100351425). The NRC staff has prepared Standard Technical Specifications (STS) for each of the light-water reactor nuclear steam supply systems and associated plant systems. The guidance specifies that the NRC 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 McGuire are contained in NUREG-1431, "Standard Technical Specifications-Westinghouse Plants," Revision 4.0 (ADAMS Accession No. ML12100A222). The CT 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 CT is based on the capabilities provided by the operable train and the low probability of a design basis accident occurring during this time period.

The plant configuration changes associated with maintenance activities can affect the operational safety of the facility. 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 system, structure, or components (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 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.

### 2.3 Licensee's Proposed Changes

The proposed amendments change the current asterisked note for TS 3.5.2, Required Action A.1, TS 3.6.6, Required Action A.1, TS 3.7.5, Required Action B.1, TS 3.7.6, Required Action A.1, TS 3.7.7, Required Action A.1, TS 3.7.9, Required Action A.1, TS 3.7.11, Required Action A.1, and TS 3.8.1, Required Action B.4.

The current asterisked note (TS 3.7.7-2) states:

\* 'A' Train [applicable TS system/component] 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' 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 as described in MNS LAR [license amendment request] submittal correspondence letter MNS-16-005.

The revised asterisked note will state:

\* 'A' Train [applicable TS system/component] is allowed to be inoperable for a total of 14 days to address a non-conforming 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 31, 2019, 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 described in MNS LAR submittal correspondence letter MNS-17-031.

The system/component inside the brackets of asterisked note above is the 'A' Train of the system/component associated with the applicable TS.

The licensee's proposed changes revise the first sentence of the note to address a non-conforming condition instead of a degraded condition. The licensee also proposed a change to the end date as specified in the second sentence from March 1, 2017 to March 31, 2019. The licensee also proposed a change of the correspondence letter of the last sentence from MNS-16-005 to MNS-17-031.

The original asterisked note in the current TSs were approved by 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, issued in U.S. Nuclear Regulatory Commission (NRC) letter dated March 16, 2016 (Accession No. ML15306A141).

The bases for the current CT of 72 hours is based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Change in Completion Time Allowance

The existing TS LCO 3.7.7 for the 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 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 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 McGuire unit to enter operational Mode 4 during the NSWS repair, so the licensee does not expect entry into TS LCO 3.4.6.

The licensee has requested a one-time CT extension to 14 days of Condition A of TS 3.7.7 and the associated TS Conditions of systems supported by NSWS, while the licensee isolates the piping from the SNSWP to valve 0RN-7A in order to identify and remove a flow restriction. Duke Energy previously submitted a similar LAR to the NRC on June 30, 2015 (ADAMS Accession No. ML15191A025) to perform this work. The NRC issued license amendments on March 16, 2016 (ADAMS Accession ML15306A141) to permit the 'A' Train NSWS to be inoperable for a total of 14 days to address a degraded (now reclassified as non-conforming) condition on the 'A' Train supply piping from the SNSWP. The 14 days were to be taken by March 1, 2017.

The licensee did not perform the work and instead made an effort to resolve the non-conforming condition by accepting the condition as-is and bringing it into the McGuire licensing basis under 10 CFR 50.59. The licensee stated in their September 14, 2017 letter, that effort was not successful. As a result, the piping inspection was not performed by the March 1, 2017 deadline. The licensee has submitted a similar license amendment request in their September 14, 2017 letter, but simplified the approach by eliminating the plans to install a manway in the Auxiliary Building.

The location of the restriction appears to be in the 'A' Train NSWS piping under McGuire, Unit 2 EDG building. Before starting the NSWS repair evolution a survey/inspection is planned to confirm the location, size and characterization of the restriction. The inspection would utilize the yard manway. The survey will be conducted under the existing TS 3.7.7 CT of 72 hours. If the restriction could be removed within the 14 day extension requested by the LAR, the licensee would proceed with the removal activities.

The licensee anticipates that the activities involved in removing the obstruction would significantly exceed the 72 hour CT permitted by TS 3.7.7. The licensee identified the following expected major activities:



ACTIVITY	TIME
<b>Tagout and Prestaging</b>	<b>12 hours</b>
<ul style="list-style-type: none"> <li>• Tag out valve ORN-7A and remove 'A' Train Suction piping from service.</li> <li>• Remove Missile Shield &amp; ORNFA0002 Flange [see Detail E of ML17349A158].</li> <li>• Establish Confined Space &amp; [Foreign Material Exclusion] FME controls.</li> <li>• Install pre-built work platform and Diver retrieval equipment.</li> </ul>	
<b>Perform Inspection of A RN Piping</b>	<b>12 hours</b>
<ul style="list-style-type: none"> <li>• Diver to enter 'A' Train piping via ORNFA0002 flange to locate and characterize obstruction.</li> </ul>	
<b>Extract Blockage</b>	<b>168 hours</b>
<ul style="list-style-type: none"> <li>• Divers remove obstruction as required from 'A' Train suction piping through ORNFA0002 (limited stay time &amp; multiple entries) using pre-staged equipment.</li> <li>• After removal of obstruction, Divers to inspect and repair affected piping, IF required.</li> <li>• Divers to remove equipment and foreign material from affected piping.</li> <li>• Divers to perform final FME inspection from ORNFA0002 to ORN-7A to ensure no foreign material remains.</li> <li>• Maintenance verify piping is ready for restoration.</li> </ul>	
<b>Recovery and Restoration</b>	<b>24 hours</b>
<ul style="list-style-type: none"> <li>• Confirm all FME logs have been reconciled prior to closing ORNFA0002 flange.</li> <li>• Maintenance to restore system boundary (close ORNFA0002 flange and restore missileshield).</li> <li>• [Operations] Ops to remove tag out.</li> <li>• Ops to perform reverse system flush.</li> <li>• Perform system testing, as required.</li> </ul>	
<b>Contingency for repair scope unknown</b>	<b>120 hours</b>
<b>Requested Allowed Outage Time (AOT)</b>	<b>336 hours</b>

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 McGuire TSs. The proposed change to TS 3.7.7, modified the current asterisked note to allow the one-time 14-day CT extension to be taken up to March 31, 2019 and identified letter MNS 17-031 as the correspondence that identifies the contingent Compensatory Measures required when applying the extended CT. The revised note also changed the description of the condition from degraded to non-conforming.

The 14-day CT extension is based on the most likely scenario for the non-conforming condition which is that a fixed construction artifact in the 'A' Train NSWS piping is restricting flow to the suction of the 'A' Train NSWS pumps from the SNSWP. The scope of planning for this activity includes actions to extract the debris and complete any minor repairs associated with removal of the debris. The scope of the activity does not allow for major excavation or activities that would

adversely affect other Safety Related SSCs or Functions. Identification of a condition in which repairs could impact the ability of an SSC to perform its Safety Function would result in termination of activities and restoration of 'A' Train NSWS to the current non-conforming condition. During the 14-day proposed CT extension, the licensee will maintain the 'A' Train in service and functional via the LLI from Lake Norman, which is the design basis alignment for a SI signal. This is the normal and engineered safety features actuation signal (ESFAS) alignment for 'A' Train NSWS. Using the LLI satisfies all design requirements except seismic event that exceeds OBE causing a loss of the LLI or damage to the Cowan's Ford Dam thereby causing a loss of Lake Norman. For a loss of the LLI and/or loss of Lake Norman, 'B' Train would provide the required SWS cooling for both units.

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

- TS 3.5.2, "ECCS – Operating"
- TS 3.6.6, "Containment Spray System"
- 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)"
- TS 3.8.1, "AC Sources – Operating"

For each of the above systems, the CT to restore an inoperable train or component EDG to operable status would be modified by the note. The note is 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 CT was extended. Thus, during the correction of the non-conforming condition in the 'A' Train suction piping from the SNSWP, the TS changes would extend the CT 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 CT for one inoperable CRACWS train in TS 3.7.10 (30 days) exceeds the requested 14-day CT and, thus, no relief from TS 3.7.10 would be necessary.

The NRC staff evaluated whether the proposed changes to the McGuire 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 committed to maintain the 'A' Train of the NSWS in service by aligning the suction supply to the LLI from Lake Norman, which is the alignment that would result from an ESFAS. 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 and/or the loss of the LLI. For those initiating events, the operable "B" Train of NSWS would still be available and capable of mitigating a DBA in one unit and safely shutdown the other unit. If there were a failure in the 'B' Train of NSWS during those initiating events, the licensee stated that they would perform remote realignment of the 'A' Train NSWS suction from the LLI to the 'B' Train NSWS supply from the SNSWP to maintain one operable NSWS train for each unit. The loss of the LLI and/or Cowan's Ford Dam by seismic or other event 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 LLI 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 LLI. Nevertheless, for a loss of the LLI, the licensee has procedures and has committed to 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.

However, the NRC staff noticed from Figure 7 of the licensee's letter of September 14, 2017, that motor operated valves 0RN148A, 0RN148C, 0RN147A, 0RN147C and 0RN149A would need to be repositioned for an earthquake that exceeds OBE and causes damage to the Cowan's Ford Dam or LLI piping and that power may not be available since NSWS flow to the 1A and 2A EDGs may be lost. Therefore, the NRC sent the licensee a request for additional information dated November 21, 2017 (ADAMS Accession No. ML17331B149). The NRC staff asked the licensee to discuss the potential loss of the 1A and 2A EDGs and the effect on the lineup of Figure 7 of the licensee's letter of September 14, 2017, which reconfigures the 'A' Train NSWS to take suction from the 'B' Train SNSWP supply. The licensee responded in their December 17, 2017 letter, stating the failure of the Cowan's Ford Dam would allow at least 70 minutes until the 'A' NSWS pumps would lose net positive suction head providing sufficient time to align the 'A' Train NSWS to the 'B' Train SNSWP suction. There is an additional separate 60 minutes allowed by procedure to align the SNSWP suction valve required for this lineup while the discharge is aligned to Lake Norman. The licensee also stated the LLI piping will remain intact and functional long enough to the 'A' Train NSWS suction to be aligned to the SNSWP before catastrophic failure of the NSWS piping occurs following a seismic event. Thus, design features of the NSWS and operational considerations that support reliable realignment of the 'A' Train NSWS to the 'B' Train supply from the SNSWP result in a minimal change in the reliability of the NSWS to perform its design functions during the proposed maintenance activities.

### 3.2 Alternate Success Paths for Decay Heat Removal

The licensee also described that the Standby Shutdown System (SSS) 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" (ADAMS Accession No. ML12054A735), would be available to provide alternate means of completing certain key safety functions. The SSS provides an alternate and independent means to achieve a hot standby condition and maintain the hot standby condition for up to 72 hours. The SSS 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. The primary objective of FLEX is to provide a capability to cope with a simultaneous extended loss of alternating current power and loss of UHS (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 ((ADAMS Accession No. ML15343A010), Duke Energy notified the NRC of full compliance with Order EA-12-049. Therefore, FLEX and the SSS are available to provide defense in depth backup capability for a one-time CT extension request.

### 3.3 Compensatory Measures

In section 3.5 of the licensee's submittal dated September 14, 2017, the licensee proposed compensatory measures to be in place during the 14-day CT extension. The compensatory measures are stated in the licensee's letter of September 14, 2017, and are required in accordance with the proposed TS note. The compensatory measures are also listed in the proposed conforming TS Bases changes and are as follows:

1. The 'A' Train NSW pumps will remain 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 NSW during the period in which the 'A' NSW piping from the SNSWP is not available will be evaluated for impact on the ability of the system to operate while taking suction from the Lake Norman LLI and will be limited to a 72 hour CT.
3. The 'B' Train NSW will be placed in its ESFAS alignment to the SNSWP water source prior to starting the LAR activity and remain in this alignment until the 'A' Train NSW 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 NSW 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. FLEX strategies will be available for implementation as additional defense-in-depth on both units.
6. During the period in which the 'A' NSW suction path from the SNSWP is nonfunctional, no discretionary maintenance or discretionary testing will be planned on the following:
  - 1AEDG
  - 2AEDG
  - The 'A' Train of NSW excluding the activities described in the LAR for the 'A' Train NSW piping to the SNSWP
  - The 'B' Train of NSW, ECCS, [Containment Spray System] CSS, AFW, CCW, CRAVS, ABFVES or the EDGs
  - The switchyard and other offsite power sources
  - The SSF
7. A condition in which repairs could impact the ability of SSCs 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 CT. Should such a condition be identified then the NSW system will be restored to its current non-conforming condition. If the survey presents any opportunities for a less intrusive or less time consuming solution for addressing the non-conforming condition, then these opportunities will be pursued, as appropriate.

8. This activity will be controlled under the Infrequently Performed Test or Evolution 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.
9. 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.
10. The Work Control Center or OCC [Outage Command Center] 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).
11. Training will be provided in accordance with the Systematic Approach to Training process to Operations personnel on this TS change and the associated evolution to inspect and correct the non-conforming condition in the 'A' NSWS supply piping from the SNSWP.
12. 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.
13. The repair work on the NSWS 'A' Train suction from the SNSWP will be NSWS B 3.7.7 scheduled during a period in which hurricanes and tornadoes have a lower likelihood of occurrence.
14. The Outage Command Center (OCC) will be manned while performing the activities authorized by this amendment.
15. The following list of equipment will be protected:
  - 'B' Train NSWS
  - 1B EDG
  - 2B EDG
  - 1B ECCS
  - 2B ECCS
  - 1B CSS
  - 2B CSS
  - 1B AFW
  - 2B AFW
  - 1B CCW
  - 2B CCW
  - B CRAVS
  - B ABFVES
  - SSF including Standby Makeup pumps for Unit 1 and Unit 2
  - Unit 1 [Turbine Drive Auxiliary Feedwater Pump] TDCAP
  - Unit 2 TDCAP
  - Unit 1 Containment Ventilation Cooling Water System (RV)
  - Unit 2 Containment Ventilation Cooling Water System (RV)

- Switchyard
16. Foreign Material Exclusion (FME) will be controlled during the proposed activities in accordance with AD-MN-ALL-0002, 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 'A' NSWS piping will also be inspected prior to closeout. The system will then be reversed flushed from the LLI to the SNSWP with isolation to downstream components to force any sediment back to the SNSWP.
  17. 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 during the 14 day CT.
  18. 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.
  19. In support of the contingency the following conditions will be established before the start of activities in the LAR:
    - The 'A' train supply header crossover valve (0RN-14A) will be opened prior to the evolution and power will be removed from the valve operator.
    - The 'B' train supply header crossover valve (0RN-15B) will be maintained closed with the ESFAS signal from each unit blocked prior to the evolution. Maintaining valve 0RN-15B closed with power removed satisfies operability requirements for the 'B' Train NSWS. Valve (0RN-15B) can be opened from the control room after power is restored if conditions warrant the use of this contingency.

The compensatory measures provide measures to protect redundant equipment, establish procedures, limit discretionary maintenance, train operators for unique actions, assign extra dedicated operators, ensure NSWS supply is not threatened by alewife fish, scheduling work outside of hurricane and tornado seasons and monitoring weather conditions, and pertinent operator training among other specified compensatory measures as described above and in the licensee's letter of September 14, 2017.

### 3.2 NRC Staff Conclusion

The changes to the supported system TSs (i.e., 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 CTs for supported system inoperability resulting from the NSWS repair activity. Since the proposed CT 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. Therefore, the analysis which supports approval of the NSWS one-time TS change also supports the one-time TS change for supported systems. Other causes of inoperability for the supported systems would cause entry into the appropriate permanent LCO condition with its shorter allowed CT.

The NRC staff considered the special procedures and training to mitigate the initiating events of concern (i.e. loss of Cowan's Ford Dam and/or LLI with or without the subsequent loss of a B NSWS Pump, concurrent with a DBA), the low probability of such events occurring within the

14-day CT, the contingency measures invoked, the defense-in-depth added by the FLEX and the SSS, the initial lineup which is already in ESFAS lineup, and the functionality of the A Train using the LLI during the 14-day CT. The proposed TS changes applied only to inoperable conditions resulting from the NSWWS repair activities, so the increase in CT would not apply to other causes of inoperability that could result in a substantial increase in risk.

Based on the above, the NRC staff concludes that the one-time increase to a 14-day allowed CT for an inoperable NSWWS train during 'A' Train repair activities would be appropriate and are acceptable while continuing to meet the requirements of 10 CFR 50.36 and 10 CFR 50.65 and the regulatory guidelines of RG 1.160 and Section 16.0 of NUREG-0800.

#### 4.0 NO SIGNIFICANT HAZARDS CONSIDERATION

The NRC's regulation in 10 CFR 50.92(c) states that the NRC may make a final determination, under the procedures in 10 CFR 50.91, that a license amendment involves no significant hazards consideration if operation of the facility, in accordance with the amendment, would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

An evaluation of the issue of no significant hazards consideration is presented below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The 'B' Train NSWWS and supported equipment will remain fully operable during the 14 day CT [completion time]. The alignment of the 'A' Train NSWWS will remain consistent with the NSWWS normal and ESFAS [Engineering Safety Features Actuation System] alignment. Although not fully operable the 'A' Train NSWWS and its supported equipment will be capable of performing their functions during the 14 day CT.

The 'A' NSWWS and supported equipment function as accident mitigators. Removing 'A' Train SNSWP [Standby Nuclear Service Water Pond] supply piping from service for a limited period of time does not affect any accident initiator and therefore cannot change the probability of an accident. The proposed changes and the 'A' Train NSWWS repair evolution have been evaluated to assess their impact on the systems affected and ensure design basis safety functions are preserved.

The risk analysis for the proposed NSW system alignment during the 14 day CT shows no delta risk for any ESF actuation event that does not involve an earthquake. The most significant risk contributor is a seismic event with a magnitude great enough to cause the failure of Cowan's Ford dam and subsequent loss of Lake Norman or LLI [low level intake] during the 14 day CT. The estimated Incremental Conditional Core Damage Probability (ICCDP) due to the seismic event is much less than the limits associated with Regulatory Guide 1.177.



In addition, as previously stated, a Seismic Fragility Assessment of the McGuire Low Level Intake Water Pipeline in December of 2011 indicates that the dam and water supply would withstand a SSE [Safe Shutdown Earthquake]. Therefore for the short duration of this proposed alignment the increase in risk is deemed to be negligible.

Risk associated with tornado/high winds was assessed. The months of November through February have been the seasonal low for tornado frequency. This evolution is currently scheduled for the spring February 2018 time frame. The risk contribution from tornado and high wind events is negligible during the proposed NSW configuration described in this LAR and therefore, the calculated Core Damage Frequency (CDF) or the Large Early Release Fraction (LERF) contribution due to high wind and tornado events is negligible with respect to overall risk. The activities covered by this LAR also include a defense-in-depth action to cease activities and close the personnel access opening in the event of a tornado warning. Weather patterns will be monitored and this activity will be modified if tornado/high wind conditions become imminent.

The overall increase in risk for the 14 day CT is solely due to the seismic event which results in a loss of Lake Norman or LLI. However, this risk is reduced by the defense in depth strategy described in the LAR that provides a contingency for the loss of a 'B' Train NSW pump after the loss of the Lake Norman water supply. This defense in depth contingency effectively offsets the unavailability of the 'A' Train NSW SNSWP supply.

In addition, pre-aligning the 'B' Train NSW to the SNSWP water supply in advance of the proposed activities prevents the introduction of potential equipment failures during an ESFAS demanded transfer. This action also eliminates the time it would take operators to perform the transfer following a seismic event.

As stated in NRC Generic Letter 80-30, "Clarification of the Term 'Operable' as it Applies to Single Failure Criterion for Safety Systems Required by TS," there is no requirement to assume a single failure while operating under a Technical Specification (TS) required action. Therefore, there will be no effect on the analysis of any accident or the progression of the accident since the operable NSW 'B' train is capable of serving 100 percent of all the required heat loads. As such, there is no impact on consequence mitigation for any transient or accident.

In light of the above discussion, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.



The proposed amendment is the one time extension of the required CTs from 72 hours for the ECCS, CSS [Containment Spray System], NSWS, AFW, CCW and the EDG [Emergency Diesel Generator] systems and from 168 hours for the CRAVS and ABFVES systems to 336 hours. The requested change does not involve the addition or removal of any plant system, structure, or component.

The proposed temporary TS changes do not affect the basic design, operation, or function of any of the systems associated with the TS impacted by the amendment. Implementation of the proposed amendment will not create the possibility of a new or different kind of accident from that previously evaluated.

McGuire intends to isolate, inspect, and repair the 'A' Train NSWS supply from the SNSWP. This activity will require that 'A' Train NSW be aligned to Lake Norman until the system is ready for post maintenance testing. This action maintains the NSW 'A' Train's normal and automatic alignment to Lake Norman but will result in the inability to manually align the 'A' Train NSWS to the SNSWP subsequent to a seismic event that results in damage to the supply piping from Lake Norman or the highly improbable loss of Lake Norman.

Although considered inoperable, the 'A' Train NSWS and supported systems will be technically capable of performing their intended functions. Throughout the repair project, compensatory measures will be in place to provide additional assurance that the affected systems will continue to be capable of performing their intended safety functions.

No new accident causal mechanisms are created as a result of the requested changes creating the possibility of a new or different kind of accident from any accident previously evaluated.

In conclusion, this proposed LAR does not impact any plant systems that are accident initiators and does not impact any safety analysis. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in the margin of safety?

Response: No.

Margin of safety is related to the confidence in the ability of the fission product barriers to perform their design functions during and following an accident situation. These barriers include the fuel cladding, the reactor coolant system, and the containment system. The performance of the fuel cladding, reactor coolant and containment systems will not be impacted by the proposed LAR.

Additionally, the proposed amendment does not involve a change in the design or operation of the plant. The activity only extends the amount of time the 'A' NSW system is allowed to be inoperable to correct the non-conforming condition on the 'A' NSW supply piping from the SNSWP. As stated previously, the 'A' Train NSW and supported equipment will remain in its Normal and ESFAS alignment during the extended CT and be functionally capable for all postulated events except a seismic event that results in loss of the Lake Norman water supply.

Defense-in-depth measures involving use of the Main Supply Crossover piping to supply suction to affected unit's 'A' Train NSW pump from the 'B' train SNSWP suction piping and the ability to implement the FLEX strategy on both units provide additional safety margin for this event. Use of the Main Supply Crossover line is only needed in the unlikely event that one unit's 'B' Train NSW pump fails after loss of 'A' Train NSW due to an earthquake.

The estimated ICCDP during the 14 day CT extension is much less than the limits associated with Regulatory Guide 1.177. Therefore, it is concluded that the proposed changes do not involve a significant reduction in the margin of safety.

Based on the above evaluation, the NRC staff concludes that the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff has made a final determination that no significant hazards consideration is involved for the proposed amendment and that the amendment should be issued as allowed by the criteria contained in 10 CFR 50.91.

## 5.0 STATE CONSULTATION

In accordance with the Commission's regulations, NRC staff notified the North Carolina State official of the proposed issuance of the amendments on January 12, 2018. The State official confirmed on January 29, 2018, that the State of North Carolina had no comments.

## 6.0 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 this finding (82 FR 60226: December 19, 2017). 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.

## 7.0 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 Contributors: G. Purciarello, NRR

Date of issuance: February 15, 2018

SUBJECT: MCGUIRE NUCLEAR STATION, UNITS 1 AND 2 – ISSUANCE OF AMENDMENTS 308 AND 287 FOR TEMPORARY CHANGES TO TECHNICAL SPECIFICATIONS TO ADDRESS AN 'A' TRAIN NUCLEAR SERVICE WATER NON-CONFORMING CONDITION (CAC NOS. MG0242 AND MG0243; EPID L-2017-LLA-0299) DATED FEBRUARY 15, 2018

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