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

September 26, 2016

Mr. Steven D. Capps
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 REGARDING ONE-TIME EXTENSION OF APPENDIX J TYPE A INTEGRATED LEAKAGE RATE TEST INTERVAL (CAC NOS. MF7407 AND MF7408)

Dear Mr. Capps:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 290 to Renewed Facility Operating License No. NPF-9 and Amendment No. 269 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 February 18, 2016, as supplemented by letter dated June 30, 2016.

The amendments allow a one-time extension to the 10-year frequency of the McGuire Nuclear Station, Units 1 and 2, containment leakage rate test. The change extends the period from 10 years to 10.5 years between successive tests. This test is required by Technical Specification 5.5.2, "Containment Leakage Rate Testing Program." This revision changes the performance of the next integrated leak rate test from the scheduled fall 2017 to spring 2019 for Unit 1 and from spring 2017 to fall 2018 for Unit 2.

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,

for

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. 290 to NPF-9
2. Amendment No. 269 to NPF-17
3. Safety Evaluation

cc w/enclosures: 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. 290
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 (licensee), dated February 18, 2016, as supplemented by letter dated June 30, 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.

Enclosure 1

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. 290, 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 60 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 Technical Specifications

Date of Issuance: September 26, 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. 269
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 February 18, 2016, as supplemented by letter dated June 30, 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. 269, 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 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Michael T. Markley

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 Technical Specifications

Date of Issuance: September 26, 2016

ATTACHMENT

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

LICENSE AMENDMENT NO. 290

RENEWED FACILITY OPERATING LICENSE NO. NPF-9

DOCKET NO. 50-369

AND

LICENSE AMENDMENT NO. 269

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 with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
NPF-9, page 3	NPF-9, page 3
NPF-17, page 3	NPF-17, page 3
5.5-1	5.5-1
5.5-2	5.5-2

(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. 290, 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 Part 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 3,469 megawatts thermal (100%).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 269, 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.

5.0 ADMINISTRATIVE CONTROLS

5.5 Programs and Manuals

The following programs shall be established, implemented, and maintained.

5.5.1 Offsite Dose Calculation Manual (ODCM)

The ODCM shall contain the methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm and trip setpoints, and in the conduct of the radiological environmental monitoring program.

Licensee initiated changes to the ODCM:

a. Shall be documented and records of reviews performed shall be retained. This documentation shall contain:

   1. sufficient information to support the change(s) together with the appropriate analyses or evaluations justifying the change(s), and

   2. a determination that the change(s) do not adversely impact the accuracy or reliability of effluent, dose, or setpoint calculations;

b. Shall become effective after the approval of the Plant Manager or Radiation Protection Manager; and

c. Shall be submitted to the NRC in the form of a complete, legible copy of the entire ODCM as a part of or concurrent with the Radioactive Effluent Release Report for the period of the report in which any change in the ODCM was made. Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed, and shall indicate the date (i.e., month and year) the change was implemented.

5.5.2 Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, as modified by the following exceptions:

a. NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the October 21, 2008 (Unit 1) and March 31, 2008 (Unit 2) Type A test shall be performed no later than plant restart after the End Of Cycle 26 Refueling Outage (Unit 1) and no later than plant restart after the End Of Cycle 25 Refueling Outage (Unit 2), and

5.5 Programs and Manuals (continued)

b. The containment visual examinations required by Regulatory Position C.3 shall be conducted 3 times every 10 years, including during each shutdown for SR 3.6.1.1 Type A test, prior to initiating the Type A test.

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is 14.8 psig. The containment design pressure is 15 psig. The maximum allowable containment leakage rate, L_a, at P_a, shall be 0.3% of containment air weight per day.

Leakage Rate acceptance criteria are:

a. Containment leakage rate acceptance criterion is $\leq 1.0\ L_a$. During the first plant startup following testing in accordance with this program, the leakage rate acceptance criteria are $\leq 0.75\ L_a$ for Type A tests and $< 0.6\ L_a$ for Type B and Type C tests.

b. Airlock testing acceptance criteria for the overall airlock leakage rate is $\leq 0.05\ L_a$ when tested at $\geq P_a$. For each door, the leakage rate is $\leq 0.01\ L_a$ when tested at $\geq$ 14.8 psig.

The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.

Nothing in these Technical Specifications shall be construed to modify the testing frequencies required by 10CFR50, Appendix J.

5.5.3 Primary Coolant Sources Outside Containment

This program provides controls to minimize leakage from those portions of systems outside containment that could contain highly radioactive fluids during a serious transient or accident to levels as low as practicable. The systems include Containment Spray, Safety Injection, Chemical and Volume Control, Nuclear Sampling, RHR, Boron Recycle, Refueling Water, Liquid Waste, and Waste Gas. The program shall include the following:

a. Preventive maintenance and periodic visual inspection requirements; and

b. Integrated leak test requirements for each system at refueling cycle intervals or less.

5.5.4 Deleted

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

AMENDMENT NO. 290 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-9

AND

AMENDMENT NO. 269 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 application dated February 18, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16076A413), as supplemented by letter dated June 30, 2016 (ADAMS Accession No. ML16193A657), Duke Energy Carolinas, LLC (the licensee) submitted a license amendment request (LAR) for the McGuire Nuclear Station (MNS), Units 1 and 2. The LAR would revise Technical Specification (TS) 5.5.2, "Containment Leakage Rate Testing Program," to allow for a one-time extension of the maximum integrated leak rate test (ILRT) interval. The licensee indicated that these extensions would reduce the impact of performing the next ILRTs on critical path outage activities during the refuel outages prior the end of the respective inservice inspection (ISI) 10-year intervals.

The existing TS reflects the adoption of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix J, Option B, for a performance-based primary containment leakage testing program by License Amendment Nos. 207 and 188, dated September 4, 2002 (ADAMS Accession No. ML022540102). Those amendments allowed for an ILRT maximum interval of 10 years with provision for a grace period of up to 15 months beyond 10 years, under a limited set of circumstances, in accordance with the adopted guidance of Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program", September 1995 (ADAMS Accession No. ML003740058), which endorsed the Nuclear Electric Institute Technical Report NEI 94-01, Revision 0, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 21, 1995 (ADAMS Accession No. ML11327A025).

A one-time extension of the 10-year interval to 15 years was allowed by Amendment Nos. 211 and 192, dated March 12, 2003 (ADAMS Accession No. ML030760032). The one-time 15 year interval for MNS, Unit 1, was subsequently extended an additional 6 months by Amendment No. 244, dated February 13, 2008 (ADAMS Accession No. ML073400670). The ILRTs subsequent to these previously approved one-time extensions remained at 10 years in accordance with TS 5.5.2.

The licensee proposed the TS changes by providing historical plant-specific containment leakage testing program results and containment inservice inspection (CISI) program results and a supporting plant-specific risk assessment. The revision would extend the next ILRT performing period from 10 years to 10.5 years between successive tests, changing the test performance from fall 2017 (End of Cycle 25 (EOC)) to spring 2019 (EOC 26) for Unit 1 and from spring 2017 (EOC 24) to fall 2018 (EOC 25) for Unit 2.

The supplemental letter dated June 30, 2016, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on May 10, 2016 (81 FR 28894).

2.0 REGULATORY EVALUATION

The regulation in 10 CFR 50.54(o) requires that primary reactor containments for water-cooled power reactors be subject to the requirements set forth in Appendix J to 10 CFR 50, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." Appendix J includes two options: "Option A – Prescriptive Requirements," and "Option B – Performance-Based Requirements," either of which may be chosen by a licensee for meeting the requirements of this appendix.

The testing requirements in 10 CFR 50, Appendix J, ensure that (a) leakage through containments or systems and components penetrating containments does not exceed allowable leakage rates specified in the TSs, and (b) integrity of the containment structure is maintained during the service life of the containment.

The regulation in 10 CFR 50, Appendix J, Option B, specifies performance-based requirements and criteria for preoperational and subsequent leakage rate testing. These requirements are met by (1) performing Type A tests to measure the containment system overall integrated leakage rate; (2) Type B pneumatic tests to detect and measure local leakage rates across pressure-retaining leakage limiting boundaries such as penetrations; and (3) Type C pneumatic tests to measure containment isolation valve leakage rates. After the preoperational tests, these three tests are required to be conducted at periodic intervals based on the historical performance of the overall containment system (for Type A tests), and based on the safety significance and historical performance of each penetration boundary and isolation valve (for Type B and Type C tests) to ensure integrity of the overall containment system as a barrier to fission product release.

The leakage rate test results must not exceed the allowable leakage rate (L_a) with margin, as specified in the TSs. Option B also requires that a general visual inspection of the accessible interior and exterior surfaces of the containment system for structural deterioration, which may affect the containment leaktight integrity, must be conducted prior to each Type A test and at a periodic interval between tests.

Section V.B.3 of 10 CFR 50, Appendix J, Option B, requires that the regulatory guide or other implementation document used by a licensee to develop a performance-based leakage testing program must be included by general reference in the plant TSs. Furthermore, the submittal for TS revisions must contain justification, including supporting analyses, if the licensee chooses to deviate from methods approved by the Commission and endorsed in a regulatory guide. The regulation in 10 CFR 50.55a, "Codes and standards," contains the CISI program requirements that, in conjunction with the requirements of Appendix J, ensure the continued leaktight and structural integrity of the containment during its service life.

The regulation in 10 CFR 50.65(a), "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," paragraph (a)(1), states, in part, that the licensee:

> ... shall monitor the performance or condition of structures, systems, or components, against licensee-established goals, in a manner sufficient to provide reasonable assurance that these structures, systems, and components, as defined in paragraph (b) of this section, are capable of fulfilling their intended functions. These goals shall be established commensurate with safety and, where practical, take into account industrywide operating experience.

It states in 10 CFR 50.36, "Technical specifications," that the TSs include items in five specific categories. These categories include: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements; (4) design features; and (5) administrative controls.

NUREG-1431, Revision 4, "Standard Technical Specifications - Westinghouse Plants," incorporated the Standard Technical Specifications Task Force (TSTF) Traveler TSTF-52, Revision 3, "Implement 10 CFR, Appendix J, Option B," dated March 8, 2000 (ADAMS Accession No. ML040400371), which provided guidance for specific changes to TSs for implementation of 10 CFR 50, Appendix J, Option B.

As additional background, the U.S. Nuclear Regulatory Commission (NRC) staff has issued licensing amendments to a significant number of reactor units that extended their Type A test intervals to 15 years on a permanent basis, based primarily on probabilistic risk assessment arguments. Also, the NRC staff refers to NRC Regulatory Issue Summary (RIS) 2008-27, "Staff Position on Extension of the Containment Type A Test Interval Beyond 15 Years Under Option B of Appendix J to 10 CFR Part 50," dated December 8, 2008 (ADAMS Accession No. ML080020394), for guidance on justifications that would not be acceptable for extending ILRT intervals. The licensee's proposed request for MNS, Units 1 and 2, is on a one-time basis, but only increases the Type A test interval by 6 months (to 10.5 years). The licensee cited the Oconee Nuclear Station, Units 1, 2, and 3; Palisades Nuclear Plant; Arkansas Nuclear One, Unit No. 2; Vermont Yankee Nuclear Power Station; and Nine Mile Point Nuclear Station, Unit 1, as precedents in obtaining NRC approval of LARs similar to the one proposed for MNS, Units 1 and 2.

3.0 <u>TECHNICAL EVALUATION</u>

MNS, Units 1 and 2, are Westinghouse design four-loop pressurized-water reactors within ice-condenser pressure suppression design containments. The primary containment consists of a freestanding welded plate steel vessel in the form of a vertical cylinder with a hemispherical dome and a flat base. The containment vessel has a diameter of 115 feet and overall height of 171 feet, 3 inches. A reinforced concrete reactor building of similar shape, but with a shallow dome roof, surrounds the containment vessel with an annular gap in between and provides radiation shielding and protection of the containment vessel from external missiles and ambient conditions. The annular gap volume has a fan and filter system to gather and treat post-accident primary containment atmosphere leakage to reduce potential airborne release of radioactivity.

The primary containment provides the "leaktight" barrier against the potential uncontrolled release of fission products during a design-basis loss-of-coolant accident (DBA-LOCA). TS 5.5.2 identifies the primary containment allowable leakage rate (L_a) as 0.3 weight percent of the contained free volume per day at the calculated maximum DBA-LOCA pressure (P_a) of 14.8 pounds per square inch gauge (psig).

3.1 Licensee's Proposed Changes

MNS TS 5.5.2 currently states, in part, that:

> A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, as modified by the following exceptions:
>
> NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the May 27, 1993 (Unit 1) and August 20, 1993 (Unit 2) Type A test shall be performed no later than plant restart after the End of Cycle 19 Refueling Outage (Unit 1) and August 19, 2008 (Unit 2), and
>
> b. The containment visual examinations required by Regulatory Position C.3 shall be conducted 3 times every 10 years, including during each shutdown for SR 3.6.11 Type A test, prior to initiating the Type A test.

Revised MNS TS 5.5.2 would state, in part, that:

> A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, as modified by the following exceptions:
>
> a. NEI 94-01-1995, Section 9.2.3: The first Type A test performed after the October 21, 2008 (Unit 1) and March 31, 2008 (Unit 2) Type A test shall be performed no later than plant restart after the End of Cycle 26 Refueling

Outage (Unit 1) and no later than plant restart after End Of Cycle 25 Refueling Outage (Unit 2), and

b. The containment visual examinations required by Regulatory Position C.3 shall be conducted 3 times every 10 years, including during each shutdown for SR 3.6.1.1 Type A test, prior to initiating the Type A test.

Nothing in these Technical Specifications shall be construed to modify the testing frequencies required by 10CFR50, Appendix J.

The existing TS 5.5.2 exception to NEI 94-01 discussing when the next Type A test performances would be required would change to allow for the proposed interval extensions. The remaining changes would correct formatting and typographical errors introduced by the preceding amendment changes to TS 5.5.2.

3.2 Historical Type A Test (ILRT) Results

In LAR Table 3.2.4-1, the licensee presented the historical results of the MNS, Unit 1, Type A ILRT tests, as summarized below.

Test Date (Month/Year)	Leakage (Primary Containment Weight % per Day)
April 1983	0.1446
August 1986	0.1533
May 1990	0.1965
May 1993	0.1482
October 2008	0.01065

In LAR Table 3.2.4-2, the licensee presented the historical results of the MNS, Unit 2, Type A ILRT tests, as summarized below.

Test Date (Month/Year)	Leakage (Primary Containment Weight % per Day)
May 1986	0.0837
August 1989	0.1138
August 1993	0.1469
March 2008	0.1242

Based on the above, the NRC staff concludes that the last two tests for each of the MNS, Units 1 and 2, primary containments showed a leakage rate much less than the acceptance criteria, L_a, of 0.3 percent and would thus allow continuation of the 10-year interval in accordance with NEI 94-01 guidance. With no adverse trend apparent, the margin of the test results relative to the acceptance criterion would support a conclusion that exceeding the performance criterion would be unlikely with implementation of the proposed one-time interval extensions.

The NRC staff concludes that the results of the Type A ILRTs for MNS provide reasonable assurance that overall leakage will be maintained below the design-basis leak rate, consistent with the requirements of 10 CFR 50, Appendix J, Option B.

3.3 Historical Type B and Type C Test (Local Leak-Rate Test (LLRT)) Results

In LAR Table 3.3-1, the licensee presented the historical results of the MNS, Unit 1, Type B and Type C test combined, as-found, minimum pathway leakage totals, as summarized below.

Date (Year)	As-Found Minimum Pathway Leakage Rate (standard cubic centimeters per minute (sccm))	% of TS 5.5.2 Combined Type B and C Total Criterion (0.6 L_a, which equates to 84,227 sccm)
2008	6049	7.2
2010	8338	9.9
2011	11068	13.1
2013	7589	9.0
2014	8871	10.5

In LAR Table 3.3-2, the licensee presented the historical results of the MNS, Unit 2, Type B and Type C test combined, as-found, minimum pathway leakage totals, as summarized below.

Date (Year)	As-Found Minimum Pathway Leakage Rate (standard cubic centimeters per minute (sccm))	% of TS 5.5.2 Combined Type B and C Total Criterion (0.6 L_a, which equates to 84,227 sccm)
2009	1357	1.6
2011	1794	2.1
2012	1420	1.7
2014	3655	4.3
2015	1612	1.9

Based on the above, the NRC staff concludes that the TS 5.5.2 acceptance criterion for combined Type B and Type C test total is 0.6 L_a, which the LAR indicated as being 84,227 sccm. These totals were calculated using the as-found minimum pathway values. Option B has the as-found minimum pathway values totaled and evaluated with the performance criterion. These results are supportive of a conclusion that the proposed one-time extension of the type A test (ILRT) intervals would result in an acceptable result.

The NRC staff concludes that the results of the Type B and Type C tests provide reasonable assurance that the as-found pathway totals will be maintained below the design-basis leak rate, consistent with the requirements in TS 5.5.2, and fulfill the requirements of 10 CFR 50, Appendix J, Option B.

3.4 MNS, Units 1 and 2, CISI Program

The licensee's American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Subsection IWE inspection program findings identified in the LAR, and the supplemental information provided in the June 30, 2016, letter, were reviewed to determine the effectiveness of the licensee's CISI program to monitor the containment condition in accessible and inaccessible areas as it may affect primary containment structural integrity and leaktightness.

In Section 3.2.2 of the submittal dated February 18, 2016, the licensee described the MNS CISI program. The licensee stated that for both Units 1 and 2, the second 10-year CISI interval began on July 15, 2005, and ended on August 31, 2014; and the third 10-Year CISI interval began on September 1, 2014, and will end on July 15, 2024. The applicable ASME Code, Section XI year and addenda for the third 10-year IWE/IWL program is the 2007 Edition, 2008 Addenda. Subsections IWE and IWL of the ASME Code, Section XI, contain ISI and repair and replacement rules for metal containment vessels (Class MC) (IWE) and concrete containment vessels (Class CC) (IWL), respectively. As discussed previously, the primary containment vessel is a freestanding welded steel structure subject to Subsections IWE and IWL of the ASME Code, Section XI.

The NRC staff noted that during the review of the CISI program, the licensee did not provide specific inspection results for the completed containment inspections associated with the following second and third 10-year inspection intervals: for Unit 1, EOCs 17-24 refueling outages (RFOs), and for Unit 2, EOCs 17-23 RFOs. Section 3.2.3, "License Renewal," of this LAR states that the CISI plan – IWE program is credited in the joint Catawba Nuclear Station and MNS license renewal application (LRA) with managing loss of material due to corrosion of steel surfaces and IWE as an aging management program for reactor building containment steel components. The program discussion and objective evidence associated with the program's effectiveness were provided in LRA Appendix B.3.7. The staff's review of the LAR submitted to the NRC in 2001 did not identify any specific CISI test results to support other than this programmatic implementation of the program's effectiveness. As a result, the staff submitted a request for additional information (RAI) to the licensee requesting the results for the completed CISI inspections for each unit as discussed above.

The licensee's letter dated June 30, 2016, in response to the RAI, provides a tabulation of inspection findings and dispositions for Unit 1 EOCs 17-24 RFOs and for Unit 2 EOCs 17-23. The NRC staff reviewed the information and noted that work orders for the steel containment vessel (SCV) internal surfaces were written to replace the moisture barrier to perform the specified modification work, and upon completion, the areas were reinspected and found acceptable. The licensee also performed visual testing (VT) VT-1 on the liner plate. Based on acceptable results of these ASME Code, Section XI, Subsection IWE, inspections, the NRC staff concludes that there is no evidence, to date, of significant degradation and that the licensee is adequately implementing its CISI program to monitor and manage degradation of both SCVs at the MNS.

As discussed in the LAR, visual inspection of accessible surface areas of the SCV by the licensee during the first and second Intervals of the CISI plan were determined to meet the requirements of IWE-1231(a). For inaccessible surface areas, the first and second intervals of the CISI plan did not identify a significant number of inaccessible surface areas. The licensee stated in the LAR that if inaccessible areas are identified during the third CISI interval, the plan shall be updated to document this data and revised as needed to demonstrate continued compliance with IWE-1231(a)(3). In addition, the licensee has addressed the industrywide operating experience discussed in NRC Information Notice (IN) 2014-07, "Degradation of Leak-Chase Channel Systems for Floor Welds of Metal Containment Shell and Concrete Metallic Liner," dated May 5, 2014 (ADAMS Accession No. ML14070A114), which addresses NRC expectations for examination of containment leak-chase channel systems, which has been added to the list of owner-specified examination requirements performed as specified in the licensee's plan described in Table 3.2.2-9 of the LAR. MNS plans to perform 100 percent inspections during each inspection interval, instead of each inspection period, as indicated in IN 2014-07. In the response to the staff's RAI on this issue, MNS noted that it intends to revise the CISI program to perform inspections of leak-chase channel systems in accordance with the periodicity and expectations stated in IN 2014-07, and as amplified in NRC RIS 2016-07, "Containment Shell or Liner Moisture Barrier Inspection," dated May 9, 2016 (ADAMS Accession No. ML16068A436). Based on the above, the NRC staff concludes the licensee's response and inspection plan is acceptable.

The plan provides for a VT-3 general visual examination of accessible surfaces of 100 percent of the containment leak-chase channel closures each inspection period in accordance with nondestructive examination (NDE)-67, "Visual Examination (VT-1 and VT-3) of Metal and Concrete Containment." The licensee's submittal dated February 18, 2016, states that walkdowns performed in response to IN 2014-07 for one EOC 23 and two EOC 23 RFOs identified certain test channel enclosures without bronze covers. The enclosure locations were identified as #45, #89, #144, and #61 for Unit 2, and one location, #86, for Unit 1. The licensee concluded that industry operating experience has shown similar or more significant findings such as open ports, evidence of boric acid, missing plugs, and channels filled with water; none of which resulted in degradation of the base liner plate that challenged operability. In Section 3.4.2 of the submittal dated February 18, 2016, the licensee described that all test enclosures have been dispositioned. Further, the submittal states that the licensee plans to perform qualified visual inspection of all accessible covers during the Unit 1 EOC 24 RFO and Unit 2 EOC 24 RFO (2017) to verify the covers remain sealed adequately and that these inspections have also been added to the CISI plan.

Other examinations performed by the licensee under this plan include VT-1 and VT-3 visual examinations and ultrasonic thickness measurements on selected surfaces opposite the ice condenser areas once every 10-year interval. In its letter dated February 18, 2016, the licensee states that there is reasonable assurance that the MNS, Unit 2, SCV base liner plate is not degraded and is capable of performing its specified safety function, and the evaluation is also applicable and bounding to MNS, Unit 1.

The licensee also conducted a focused self-assessment of containment integrity in 2008 for the Oconee Nuclear Station, MNS, and Catawba Nuclear Station. Specific concerns identified in the report were tracked in the MNS corrective action program. The most significant item identified for MNS was the Unit 2 fuel transfer tube area and thermal insulation panels. Prior to implementation of the corrective actions and closure of the assessment, the NRC issued IN 2010-12, "Containment Liner Corrosion," dated June 18, 2010 (ADAMS Accession No. ML100640449). This IN references concrete primary containments with steel liners. Since the issues were related, a new corrective action was to process an engineering change request (ECR) to provide details for an easy access port through the thermal barrier on the SCV. The licensee's submittal dated February 18, 2016, states that the ECR supported the needed ISI where the access to the surface of the containment plate is not accessible. Based on the results of the MNS recent IWE inspections discussed above and responses to staff RAIs, the NRC staff concludes that there has been no evidence to date of significant degradation of the MNS containments and that the degradations noted have been entered into the MNS corrective action program and appropriately managed and/or corrected.

Based on the above regulatory and technical evaluations, the NRC staff finds there is reasonable assurance that the licensee's CISI program, and history of the inspection findings and other issues that have been identified outside of the CISI program, are adequate to support the requested extension of the ILRTs. Therefore, the NRC staff concludes that it is acceptable to revise TS 5.5.2, as proposed, to accommodate the requested one-time extension of the ILRT interval.

3.5 Evaluation of the Proposed MNS Type A Test Interval Extensions

The ASME Code, Section XI, Subsection IWE, related information provided in the licensee's letters dated February 18, 2016, and June 30, 2016, it was noted that the containment vessel inspections have been completed successfully, with no significant indications of degradation. The proposed wording change to the MNS TSs is to an identified EOC refueling outage and not a calendar interval. Primary containment leakage testing intervals have been maintained calendar-based due to variability of refueling cycle lengths with the expectation that an ILRT would be scheduled for performance during the refueling outage before the interval was exceeded. NEI 94-01, Revision 0, includes a grace period not to exceed 15 months for accommodation of other factors, primarily fuel cycle lengthening, which many plants were undergoing or anticipating at the time that document was issued, or for extended forced outages where ILRT performance in the refuel outage just prior to the 10-year interval from the previous acceptable periodic performance being exceeded was not possible, or was impractical. The licensee indicated in its letter dated June 30, 2016, that the evaluation and justification provided for the proposed ILRT interval extensions were bounding of any slight delay in the scheduled start of the refueling outages to be specified in TS 5.5.2 as the end of the proposed one-time 10.5 year interval.

The NRC staff reviewed the information related to the licensee's proposal to extend 10 CFR 50, Appendix J, Type A (ILRT) test intervals, including historical leakage test results and ASME Code inspection results. The results provided in Section 3.2.4 of the LAR indicate that the previous ILRT Type A tests for both MNS, Units 1 and 2, showed containment performance leakage rates much less than the maximum allowable containment leakage rate (L_a at P_a) of 0.3 percent containment air weight per day. Therefore, the NRC staff concludes that the performance history of the Type A tests performed supports extending the current ILRT interval to 10.5 years.

3.6 Licensee Commitments

In Attachment 2 to the letter dated June 30, 2016, the licensee submitted one regulatory commitment to revise the CISI program to perform inspections of leak-chase channels in accordance with the NRC's expectations stated in IN 2014-07, as amplified in RIS 2016-07, by September 30, 2016.

The NRC staff concludes that reasonable controls for the implementation and for subsequent evaluation of proposed changes pertaining to the above regulatory commitment are best provided by the licensee's administrative processes, including its commitment management program. The above regulatory commitment does not warrant the creation of regulatory requirements (items requiring prior NRC approval of subsequent changes).

3.7 NRC Staff Conclusion

The NRC staff concludes that the licensee adequately implemented its performance-based containment leakage rate testing program, its CISI program, and necessary supplementary inspections to periodically examine, monitor, and manage age-related and environmental degradation of the containment. The results of past ILRTs, LLRT totals, and containment inspections shown in the licensee's letters dated February 18, 2016, and June 30, 2016, demonstrate acceptable performance and further demonstrate that the structural and leaktight integrity of the containment is maintained adequately. The NRC staff concludes there is reasonable assurance that the structural and leaktight integrity for both MNS, Units 1 and 2, containments will continue to be maintained without undue risk to public health and safety, with a one-time extension of the current Type A interval to 10.5 years.

Therefore, the NRC staff concludes that the revised program description continues to contain the appropriate administrative controls for the Containment Leak Rate Testing Program and that the revised TSs continue to provide the appropriate administrative controls to ensure that the requirements of 10 CFR 50.36(c)(5) are satisfied. The NRC staff also reviewed the licensee's risk assessment and concludes that the risk impact of the extension to 10.5 years is small, and there is reasonable assurance that the approval of this extension will not create an undue risk to public health and safety.

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 this finding (81 FR 28894; May 10, 2016). 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.

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Date: September 26, 2016

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,

/RA VSreenivas for/

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. 290 to NPF-9
2. Amendment No. 269 to NPF-17
3. Safety Evaluation

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RecordsAmend
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