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

December 29, 2017

Vice President, Operations
Entergy Operations, Inc.
Grand Gulf Nuclear Station
P.O. Box 756
Port Gibson, MS 39150

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 – ISSUANCE OF AMENDMENT RE: ONE CYCLE EXTENSION OF APPENDIX J TYPE A INTEGRATED LEAKAGE TEST AND DRYWELL BYPASS TEST INTERVAL (CAC NO. MF9461; EPID L-2016-LLA-0040)

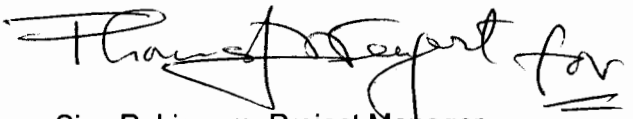
Dear Sir or Madam:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 214 to Renewed Facility Operating License No. NPF-29 for the Grand Gulf Nuclear Station (GGNS), Unit 1. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated December 29, 2016, as supplemented by letter dated August 25, 2017.

The amendment allows a one-time extension to the 10-year frequency of the GGNS containment leakage rate test (i.e., Integrated Leakage Rate Test (ILRT)) and the drywell bypass leakage rate test (DWBT). These tests are required by GGNS TS 5.5.12, "10 CFR 50 [Title 10 of the *Code of Federal Regulations* Part 50], Appendix J, Testing Program" and TS Surveillance Requirement 3.6.5.1.1, respectively. The change permits existing ILRT and DWBT frequencies to be extended from 10 years to 11.5 years between tests. This extension would allow the performance of the next ILRT and DWBT from the scheduled spring 2018 End of Cycle (EOC) 21 refueling outage to the spring 2020 EOC 22 refueling outage.

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

Sincerely,



Siva P. Lingam, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosures:
1. Amendment No. 214 to NPF-29
2. Safety Evaluation

cc: Listserv

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

ENTERGY OPERATIONS, INC.

SYSTEM ENERGY RESOURCES, INC.

COOPERATIVE ENERGY, A MISSISSIPPI ELECTRIC COOPERATIVE

ENTERGY MISSISSIPPI, INC.

DOCKET NO. 50-416

GRAND GULF NUCLEAR STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 214
Renewed License No. NPF-29

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

   A. The application for amendment by Entergy Operations, Inc. (the licensee), dated December 29, 2016, as supplemented by letter dated August 25, 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 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;

   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 amended by 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-29 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 214 are hereby incorporated into this renewed license. Entergy Operations, Inc. shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented by February 18, 2018.

FOR THE NUCLEAR REGULATORY COMMISSION

for

Robert J. Pascarelli, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility
Operating License No. NPF-29 and
the Technical Specifications

Date of Issuance: December 29, 2017

ATTACHMENT TO LICENSE AMENDMENT NO. 214

RENEWED FACILITY OPERATING LICENSE NO. NPF-29

GRAND GULF NUCLEAR STATION, UNIT 1

DOCKET NO. 50-416

Replace the following page of the Renewed Facility Operating License No. NPF-29 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.

Facility Operating License

Remove	Insert
4	4

Technical Specifications

Remove	Insert
3.6-53	3.6-53
5.0-16	5.0-16

amended, are fully applicable to the lessors and any successors in interest to those lessors, as long as the renewed license of GGNS Unit 1 remains in effect.

(b) SERI is required to notify the NRC in writing prior to any change in (i) the terms or conditions of any new or existing sale or lease agreements executed as part of the above authorized financial transactions, (ii) the GGNS Unit 1 operating agreement, (iii) the existing property insurance coverage for GGNS Unit 1 that would materially alter the representations and conditions set forth in the Staff's Safety Evaluation Report dated December 19, 1988 attached to Amendment No. 54. In addition, SERI is required to notify the NRC of any action by a lessor or other successor in interest to SERI that may have an effect on the operation of the facility.

C. The renewed 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

Entergy Operations, Inc. is authorized to operate the facility at reactor core power levels not in excess of 4408 megawatts thermal (100 percent power) in accordance with the conditions specified herein.

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 214 are hereby incorporated into this renewed license. Entergy Operations, Inc. shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

During Cycle 19, GGNS will conduct monitoring of the Oscillation Power Range Monitor (OPRM). During this time, the OPRM Upscale function (Function 2.f of Technical Specification Table 3.3.1.1-1) will be disabled and operated in an "indicate only" mode and technical specification requirements will not apply to this function. During such time, Backup Stability Protection measures will be implemented via GGNS procedures to provide an alternate method to detect and suppress reactor core thermal hydraulic instability oscillations. Once monitoring has been successfully completed, the OPRM Upscale function will be enabled and technical specification requirements will be applied to the function; no further operating with this function in an "indicate only" mode will be conducted.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.5.1.1	Verify bypass leakage is less than or equal to the bypass leakage limit. However, during the first unit startup following drywell bypass leak rate testing performed in accordance with this SR, the acceptance criterion is leakage ≤ 10% of the bypass leakage limit.	24 months following 2 consecutive tests with bypass leakage greater than the bypass leakage limit until 2 consecutive tests are less than or equal to the bypass leakage limit AND 48 months following a test with bypass leakage greater than the bypass leakage limit AND ------NOTE------ SR 3.0.2 is not applicable for extensions > 12 months. ---------- 120 months, except that the next drywell bypass leak rate test performed after the October 19, 2008 test shall be performed no later than the plant restart after the End of Cycle 22 Refueling Outage.

(continued)

5.5 Programs and Manuals (continued)

5.5.11 Technical Specifications (TS) Bases Control Program

This program provides a means for processing changes to the Bases of these Technical Specifications.

a. Changes to the Bases of the TS shall be made under appropriate administrative controls and reviews.

b. Licensees may make changes to Bases without prior NRC approval provided the changes do not require either of the following:

1. A change in the TS incorporated in the license; or

2. A change to the updated FSAR or Bases that requires NRC approval pursuant to 10 CFR 50.59.

c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the UFSAR.

d. Proposed changes that do not meet the criteria of either Specification 5.5.11.b.1 or Specification 5.5.11.b.2 above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 50.71(e).

5.5.12 10 CFR 50, Appendix J, Testing Program

This program establishes the leakage rate testing program 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 implemented in accordance with the Safety Evaluation issued by the Office of Nuclear Reactor Regulation dated April 26, 1995 (GNRI-95/00087) as modified by the Safety Evaluation issued for Amendment No. 135 to the Operating License, except that the next Type A test performed after the October 19, 2008 Type A test shall be performed no later than the plant restart after the End of Cycle 22 Refueling Outage. For Type B and Type C local leakage rate testing, this program shall be in accordance with the guidelines contained in NEI 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 2012. Consistent with standard scheduling practices for Technical Specifications required surveillances, intervals for the recommended surveillance frequency for Type A testing may be extended by up to 25 percent of the test interval, not to exceed 15 months. The calculated peak containment internal pressure for the design basis loss of coolant accident, Pa, is 12.1 psig.

UNITED STATES
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WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 214 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-29

ENTERGY OPERATIONS, INC., ET AL.

GRAND GULF NUCLEAR STATION, UNIT 1

DOCKET NO. 50-416

1.0 INTRODUCTION

By application dated December 29, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16364A338), as supplemented by letter dated August 25, 2017 (ADAMS Accession No. ML17237A059), Entergy Operation Inc. (Entergy, the licensee) requested changes to the Technical Specifications (TSs) for the Grand Gulf Nuclear Station, Unit 1 (GGNS). The supplement dated August 25, 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) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on May 23, 2017 (82 FR 23625).

The proposed amendment would allow a one cycle extension to the 10-year frequency of the GGNS integrated leak rate test ((ILRT) or Type A test) and the drywell bypass leak rate test (DWBT). These tests are required by TS 5.5.12, "10 CFR 50 [Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50], Appendix J, Testing Program" for the ILRT and Surveillance Requirement (SR) 3.6.5.1.1 of TS 3.6 "Containment Systems" for the DWBT. In order to meet the 10-year frequency, the next ILRT and DWBT would have to be performed in the spring 2018 End of Cycle (EOC) 21 refueling outage (RFO), which would be 7 months earlier than the 10th anniversary of the completion of the last ILRT and DWBT on October 19, 2008. The proposed request would allow an extension of the period between tests, on a one-time basis, from 10 years to a maximum of 11.5 years. In terms of RFOs, the requested extension would move the performance of the next ILRT and DWBT from the scheduled spring 2018 EOC 21 RFO to the spring 2020 EOC 22 RFO.

In its December 29, 2016, license amendment request (LAR), the licensee stated that the request to permit the deferral of the ILRT and DWBT until the 2020 RFO is based on the site's ILRT and DWBT performance history, historical plant-specific containment leakage testing program and containment inservice inspection (CISI) program results, and the evaluated low risk of the 18-month extension timeframe per the probabilistic determination.

2.0 REGULATORY EVALUATION

The overall integrity (structural and leak-tight integrity) of the primary containment is verified by a Type A ILRT and the integrity of the penetrations and isolation valves are verified by Type B and Type C local leak rate tests (LLRTs) as required by 10 CFR Part 50, Appendix J. These tests are performed to verify the essential leak-tight characteristics of the containment structure at the design-basis accident pressure. The Type A test also provides a verification of structural integrity. The leakage rate testing requirements of 10 CFR Part 50 Appendix J, Option B (Type A, Type B and Type C tests) and the CISI requirements mandated by 10 CFR 50.55a, "Codes and standards," assist in ensuring the continued integrity of the containment during its service life.

The DWBT verifies that pre-existing drywell bypass leakage does not exceed the maximum allowed leakage. The DWBT acceptance criterion in the TSs is less than (<) 10 percent of the analyzed design limit. The design limit is used to establish the timing of automatic containment sprays following a loss-of-coolant accident (LOCA). The sprays control the containment pressure to less than its design limit by suppressing steam from the drywell that bypasses the suppression pool. NUREG-1434, "Standard Technical Specifications – General Electric [Boiling-Water Reactor] BWR/6 Plants," Revision 4, Volume 1 (ADAMS Accession No. ML12104A195), SR 3.6.5.1.1 describes the surveillance criteria for the DWBT.

The regulations in 10 CFR 50.36, "Technical specifications" state 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 operations; (3) SRs; (4) design features; and (5) administrative controls.

The regulation in 10 CFR Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors," was revised in 1995 by the addition of Option B, "Performance-Based Requirements," to the original requirements, which were then designated as Option A, "Prescriptive Requirements." Option B requires that a Type A test be conducted at a periodic interval based on historical performance of the overall containment system. A Type A test is an overall (integrated) leakage rate test of the containment structure.

The testing requirements in 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.

Option B to 10 CFR Part 50, Appendix J specifies performance-based requirements and criteria for pre-operational and subsequent leakage rate testing. These requirements are met by: (1) performance of 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 pre-operational tests, these 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 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 maximum allowable leakage rate (L_a) with margin, as specified in the TSs.

As part of the development of Option B, the NRC also developed Regulatory Guide (RG) 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995, to specify a method acceptable to the NRC for complying with Option B. The RG endorses, with certain exceptions, Nuclear Energy Institute (NEI) report, NEI 94-01, Revision 0, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 1995, as an acceptable method for complying with the provisions of Appendix J, Option B. Option B requires that the RG or other implementation document used by a licensee to develop a performance-based leakage rate testing program be included by general reference in the TSs.

However, in TS 5.5.12, the licensee chose not to reference RG 1.163, but instead references the NRC staff safety evaluation (SE) that was the basis for the earlier exemption from the Appendix J requirements granted to GGNS on April 26, 1995. Based on the differences between RG 1.163 (and the document it endorses, NEI 94-01) and the April 26, 1995, exemption to Appendix J and the associated NRC staff SE, as modified by the SE issued for Amendment No. 135 to the operating license, the staff determined that use of the guidance in the staff's SE is consistent with the intent of RG 1.163, and is therefore acceptable. The approved exemption authorized GGNS to use a program similar to Appendix J, Option B, in that it allowed primary containment leakage rate testing intervals to be based on performance of the structures, systems, and components involved. The test methods and criteria for containment leakage rate testing used by the licensee were not affected by this exemption.

The licensee is requesting a change to TS 5.5.12, which would add an exception from the normal requirements regarding the Type A test interval. Specifically, the proposed TS states that the next Type A test performed after the October 19, 2008, Type A test (the date of the latest test) shall be performed no later than the plant restart after the EOC 22 RFO. The local leakage rate tests (Type B and C tests), including their schedules, are not affected by this request. Based on Option B requirements to 10 CFR Part 50, Appendix J, a Type A test (or ILRT) must be conducted (1) after a containment system has been completed and is ready for operation and (2) at a periodic interval based on historical performance of the overall containment system. A general visual inspection of the accessible interior and exterior surfaces of the containment system for structural deterioration that may affect the containment leak-tight integrity must be conducted prior to each Type A test, and at a periodic interval between tests based on the performance of the containment system.

Section V.B.3 of Option B to 10 CFR Part 50, Appendix J, requires that the regulatory guide or another implementation document used by a licensee to develop a performance-based leakage testing program must be included, by general reference, in the plant TSs. Further, 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.

NEI 94-01, Revision 0, specifies an initial test interval of 48 months for the Type A test, but allows an extended interval of 10 years, based upon two consecutive successful tests and supported by a plant-specific risk assessment. It should be noted that Section 9.1 of NEI 94-01, Revision 0, allows the recommended 10-year Type A test interval to be extended by up to an additional 15 months, but with the restriction that this option should be used only in cases where refueling schedules have been changed to accommodate other factors. The purpose of this restriction is to prevent a licensee from arbitrarily adding the 15 months to every testing interval, which would effectively change the interval permanently to 11.25 years (135 months).

GGNS was approved for the implementation of the containment leak rate testing provisions of 10 CFR Part 50, Appendix J, Option B, by Amendment No. 135 (ADAMS Accession

No. ML021490221) issued by the NRC on April 6, 1998. Based on this amendment, GGNS was approved for:

- Type A test frequency of at least one test in 10 years based upon two consecutive successful tests.
- Extension of Type B tests to a maximum interval of 10 years based upon completion of two consecutive successful tests.
- Extension of Type C tests up to 5 years based on two consecutive successful tests.

The last ILRT at GGNS, prior to Amendment No. 135, was performed in November 1993. Based on Amendment No. 135, the next ILRT would have been required by November 2003. However, the NRC also issued Amendment No. 164 on January 28, 2004 (ADAMS Accession No. ML040300152), which granted a license amendment for a one-time extension of the Type A ILRT and DWBT test interval from 10 to 15 years. Consequently, the next ILRT after the November 1993 test was performed in October 2008. After the expiration of the one-time extension, GGNS reverted to 10-year ILRT and DWBT intervals, with the next ILRT for DWBT due in 2018.

NEI 94-01, Revision 3, provides guidance for extending Type C LLRT intervals beyond 60 months. On February 17, 2016, the NRC staff approved Amendment No. 209 (ADAMS Accession No. ML16011A247) for GGNS. The amendment revised the GGNS TSs to allow for a permanent extension of the Type C leakage rate testing frequency up to 75 months and a reduction of the Type B and C grace intervals that are required by GGNS TS 5.5.12, by including a reference to NEI Topical Report, NEI 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of CFR Part 50, Appendix J," dated July 2012. The guidance in NEI 94-01, Revision 3-A also has provisions for a permanent extension of the Type A ILRT test interval from 10 to 15 years. However, the licensee elected not to use this provision, and therefore, the maximum ILRT test interval for GGNS after the 2008 test remained at 10 years.

Prior to the issuance of Amendment No. 209, GGNS TS 5.5.12 contained a statement regarding the extension of surveillance frequencies for Type A, B, and C testing, as follows:

> Consistent with standard scheduling practices for Technical Specifications required surveillances, intervals for the recommended surveillance frequency for Type A, B, and C testing may be extended by up to 25 percent of the test interval, not to exceed 15 months.

By Amendment No. 209, the statement was revised to delete Type B and C tests from its applicability, but retained the applicability of Type A tests. Therefore, the current GGNS TS contains a provision to extend the 10-year Type A test interval by an additional 15 months.

GGNS TS 1.1 "Definitions," defines L_a as "The maximum allowable primary containment leakage rate, L_a, shall be 0.682% [percent] of primary containment air weight per day at the calculated peak containment pressure (P_a)."

GGNS TS 5.5.12 states, in part, that "The calculated peak containment internal pressure for the design basis loss of coolant accident, P_a, is 12.1 psig [pounds per square inch gauge]."

As required by 10 CFR Part 50, Appendix J and TS 5.5.12, the Type A, Type B, and Type C test results must not exceed the L_a with margin. The leakage rate acceptance criterion is less than or equal to (≤) 1.0 L_a. However, following testing during the first unit startup, performed in accordance with 10 CFR Part 50, Appendix J, as modified by approved exemptions, the leakage rate acceptance criteria are less than 0.6 L_a for the Type B and Type C tests, and less than 0.75 L_a for the Type A test.

The regulations in 10 CFR 50.55a contain the CISI program requirements that, in conjunction with the requirements of Appendix J, ensure the continued leak-tight and structural integrity of the containment during its service life.

The regulation in 10 CFR 50.65 "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," 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 industry-wide operating experience."

The NRC staff has previously issued a significant number of license amendments for licensees of reactor units that have requested to extend their Type A test intervals to 15 years on a permanent basis, based primarily on probabilistic risk assessment criteria. The licensee's proposed request for GGNS is on a one-time basis and only increases the Type A test interval by 18 months (from 10 years to 11.5 years). Also, the NRC staff refers to 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 NRC staff has previously issued license amendments to many reactor units that are similar in nature to the proposed LAR from Entergy for GGNS. In its LAR, the licensee cited several precedent amendments, the most recent of which are Oconee Nuclear Station, Units 2 and 3, dated August 5, 2013 (ADAMS Accession No. ML13193A329), and McGuire Nuclear Station, Units 1 and 2, dated September 26, 2016 (ADAMS Accession No. ML16236A053).

3.0 TECHNICAL EVALUATION

GGNS is designed with a General Electric Company BWR enclosed in a Mark III type containment. The drywell is enclosed within the primary containment and is designed to divert the energy released during a design-basis LOCA. The drywell communicates with the primary containment through a series of horizontal vents in the drywell wall. The vents are covered both inside and outside of the drywell by water from the annular shaped suppression pool. The pool forms a seal between the drywell and the primary containment. The drywell contains the reactor coolant system and other high energy piping systems.

Several tests are performed to ensure the integrity of the containment/drywell function, including the ILRT and DWBT. The primary containment provides the "leak tight" barrier against the potential uncontrolled release of fission products during a LOCA. TS 5.5.12, identifies the primary containment leak rate testing requirements and an overall acceptance criterion for the Type A, Type B, and Type C tests.

The DWBT verifies that pre-existing drywell leakage directly into containment (bypass suppression pool) does not exceed the maximum assumed leakage. The DWBT acceptance criterion in the TSs is ≤ 10 percent of the analyzed design limit. SR 3.6.5.1.1 verifies the bypass leakage is ≤ 1 percent of the analyzed design limit.

The proposed changes in consideration apply to a temporary, one-time extension to the next performance of the required Type A (ILRT) and DWBT tests required by the TSs.

3.1 Licensee's Proposed Changes

The GGNS TS 5.5.12 currently states:

> This program establishes the leakage rate testing program 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 implemented in accordance with the Safety Evaluation issued by the Office of Nuclear Reactor Regulation dated April 26, 1995 (GNRI-95/00087) as modified by the Safety Evaluation issued for Amendment No. 135 to the Operating License. For Type B and Type C local leakage rate testing, this program shall be in accordance with the guidelines contained in NEI 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 2012. Consistent with standard scheduling practices for Technical Specifications required surveillances, intervals for the recommended surveillance frequency for Type A testing may be extended by up to 25 percent of the test interval, not to exceed 15 months. The calculated peak containment internal pressure for the design basis loss of coolant accident, Pa, is 12.1 psig.

The proposed change to TS 5.5.12 will be the administrative change to add the performance of the next Type A test to no later than End of Cycle 22 RFO, as follows (changes identified in bold):

> This program establishes the leakage rate testing program 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 implemented in accordance with the Safety Evaluation issued by the Office of Nuclear Reactor Regulation dated April 26, 1995 (GNRI-95/00087) as modified by the Safety Evaluation issued for Amendment No. 135 to the Operating License**, except that that the next Type A test performed after the October 19, 2008 Type A test shall be performed no later than the plant restart after the End of Cycle 22 Refueling Outage**. For Type B and Type C local leakage rate testing, this program shall be in accordance with the guidelines contained in NEI 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 2012. Consistent with standard scheduling practices for Technical Specifications required surveillances, intervals for the recommended surveillance frequency for Type A testing may be extended by up to 25 percent of the test interval, not to exceed 15 months. The calculated peak containment internal pressure for the design basis loss of coolant accident, Pa, is 12.1 psig.

Currently, the surveillance frequency for SR 3.6.5.1.1 requiring verification that bypass leakage is less than or equal to the bypass leakage limit, is 120 months. The licensee is proposing to change the frequency to state "120 months**, except that the next drywell bypass leak rate**

test performed after the October 19, 2008 test shall be performed no later than the plant restart after the End of Cycle 22 Refueling Outage."

In its LAR, the licensee states that the last ILRT at GGNS was completed on October 19, 2008. In order to comply with the current allowed ILRT interval of 10 years, the next ILRT would have to be performed in the scheduled spring 2018 EOC 21 RFO, making it effectively 7 months prior to the 10th year anniversary from the last ILRT. The licensee further states that, in terms of absolute time, the proposed change results in a 1.5 year extension to the 10-year interval between the last and next ILRT. The current TSs contain a provision to extend the Type A testing up to a maximum of 15 months. Therefore, the licensee's request, in effect, exceeds the currently allowable extension in the TSs by only 3 months, given the schedule for EOC 22 RFO in spring 2020. The licensee also stated that the proposed change minimizes the impact of the ILRT and DWBT on critical path outage activities in the spring 2018 EOC 21 RFO.

3.2 Historical Leakage Rate Test Results

The licensee provided GGNS historical results of ILRT tests, Type B and Type C LLRT Combined Trend Summary, and DWBT test results. In addition, the LAR also included a detailed discussion of the inservice inspection (IWE/IWL) program and the maintenance rule monitoring in place at GGNS.

3.2.1 Integrated Leakage Rate Testing (ILRT) History

In Section 3.3.1 of the LAR by letter dated December 29, 2016, the licensee reported a historical summary of results of Type A tests performed that demonstrate the containment has a history of leak-tightness and structural integrity. The licensee stated that these tests confirmed that the containment structure has acceptable leakage well under the acceptance limits. Since 1982, five operational Type A tests have been performed with considerable margin (16.2 percent to 48.5 percent of the TS 5.5.12 limit of 0.75 L_a (0.5115 percent weight per day) where L_a is equal to 0.682 percent weight per day of the containment air mass at the peak accident pressure), thereby demonstrating that GGNS has a low leakage containment. In addition, the licensee stated that the GGNS inservice inspection (IWE/IWL) program and maintenance rule monitoring provide confidence in containment integrity. There have been no Type A ILRT failures over this period.

The As-Left leak rates over this period, in percent air weight per day, measured 0.083 to 0.248, which is less than the TS limit of 0.75 L_a (0.5115 percent weight per day). The last Type A test was performed on October 19, 2008. The testing frequency for Type B and Type C tests is not affected by the proposed amendment and will continue to be performed in accordance with NEI 94-01, Revision 3-A. Additionally, the test data results in Attachment 1, Table 3.3.2-1, "Types B and C LLRT Combined As-Found/As-Left Trend Summary," of the LAR, provide the LLRT data trend summaries for GGNS since 2005 and encompasses the previous ILRT of 2008. This summary shows that there have been no "as-found" aggregate Type B and Type C LLRT failures that resulted in exceeding the TS limit of less than 0.6 L_a, and that the aggregate results for all the Type B and C tests since 2005 were well below the acceptance criteria.

The results demonstrate a history of adequately managing the leakage rates of the Type B and Type C containment penetrations, thereby continuing to provide a high degree of assurance that containment leak-tight integrity is maintained if the Type A test is extended as proposed.

The NRC staff reviewed the information related to the licensee's proposal to extend 10 CFR Part 50, Appendix J, Type A (ILRT) test intervals, including historical leakage test results and American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME Code) inspection results. The staff finds that there is reasonable assurance that the licensee's program for periodically measuring containment leakage is being satisfactorily conducted in accordance with the requirements of TS 5.5.12. The results provided in Section 3.3 of Attachment 1 of the LAR indicate that the previous ILRT Type A tests showed containment performance leakage rates much less than the maximum allowable containment leakage rate. Additionally, the staff finds that the results of containment performance (structural and leak-tightness) from the licensee's containment leakage test program will continue to be maintained if the current Type A test frequency is extended as proposed. Therefore, the NRC staff concludes that the performance history of the last five Type A tests performed supports the proposed one cycle extension of the current Type A ILRT frequency from 10 years to 11.5 years.

3.2.2 Local Leak Rate Testing (Type B and Type C) History

Table 3.3.2-1 in Attachment 1 of the LAR by letter dated December 29, 2016, provides trend summaries for GGNS from 2005 to 2016 (total of seven RFOs).

As stated in SR 3.6.1.1.1, the leakage rate acceptance criteria for GGNS are:

> The leakage rate acceptance criterion is ≤ 1.0 L_a. However, during the first unit startup following testing performed in accordance with 10 CFR 50, Appendix J, as modified by approved exemptions, the leakage rate acceptance criteria are < 0.60 L_a for the Type B and Type C tests, and < 0.75 L_a for Type A tests.

The containment performance is demonstrated by the As-Found minimum pathway summations, whereas the As-Left maximum pathway summations signify the acceptance criteria for restart. Attachment 1, Section 3.3.2, "Containment Leakage Rate Testing Program – Type B and C Testing Program," states that L_a equals 0.682 percent weight per day of the containment air mass at the peak accident pressure or 330,000 standard cubic centimeters per minute (sccm). Therefore, it follows that 0.6 L_a equals 198,000 sccm. The results show that there have been no "as-found" aggregate Type B and Type C LLRT failures that resulted in exceeding the performance criterion of 1.0 L_a or the acceptance criterion of 0.6 L_a. The results reported in the LAR, and confirmed by the NRC staff, show:

- The "As-Found" minimum pathway leakage rate for GGNS shows an average of 9.93% of 0.6 L_a with a high of 18.06% of 0.6 L_a, or 0.1084 L_a.
- The "As-Left" maximum pathway leakage rate for GGNS shows an average of 33.23% of 0.6 L_a with a high of 61.63 percent of 0.6 L_a, or 0.3701 L_a.

While the results indicate a good margin between the combined Type B and Type C test totals and the performance criterion (0.6 L_a), the NRC staff observed a slight increase in the leakage rate trend from years 2012 to 2016 RFOs. However, the staff notes that higher leakage rates are not representative of an adverse trend because Option B affords the licensee greater flexibility in adjusting the administrative limits of leakage for Type B and Type C penetrations, while ensuring that the combined Type B and Type C test results remain below the acceptance criterion of 0.6 L_a with margin. The staff finds that the licensee has maintained an acceptable

margin, in spite of an increase in the leakage rate trend. The results suggest that performance criteria are unlikely to be exceeded during the proposed, one-time, extended ILRT interval.

In Section 3.3 of Attachment 1 of the LAR, Table 3.3.2-2 "Type B and Type C LLRT Program Implementation Review" identified five components that have not demonstrated acceptable performance during the previous two outages (i.e., leakage above the administrative limit). The components were either repaired or replaced, with As-Left leakage below the administrative limits. Four of the components were on 24-month test intervals prior to the test, and therefore, will remain on 24-month intervals, and the one component that was on an extended test interval prior to the test will be maintained at a 30-month test frequency. The NRC staff concludes that the licensee has appropriately addressed valves underperforming their administrative criteria in accordance with the Primary Containment Leakage Rate Testing Program and NEI 94-01, Revision 3-A.

The data contained in Table 3.3.2-2 indicates that the "As-Found" minimum pathway summations represent the high quality of maintenance of Type B and Type C tested components, while the "As-Left" maximum pathway summations represent the effective management of the "10 CFR 50, Appendix J, Testing Program" by the program owner. Type B and Type C tests can identify the vast majority of all potential leakage paths. The licensee is not proposing any changes to the Type B and Type C test intervals. Based on the above, the NRC staff concludes that continued testing of scheduled Type B and Type C components during 2018 Cycle 21 RFO and beyond up to the start of Cycle 22 RFO will provide a measure of assurance of the leak-tightness of the containment.

3.2.3 Drywell Bypass Leakage Rate Testing History

The current interval for the GGNS DWBT surveillance is once every 120 months. The DWBT acceptance criterion in the TSs is ≤ 10 percent of the analyzed design limit. SR 3.6.5.1.1 states:

> Verify bypass leakage is less than or equal to the bypass leakage limit.
>
> However, during the first unit startup following drywell bypass leak rate testing performed in accordance with this SR, the acceptance criterion is leakage ≤10% of the bypass leakage limit."

The frequency of 120 months is qualified by the following considerations in SR 3.6.5.1.1. In the event that a test is performed with the bypass leakage greater than its limit, the test frequency becomes once every 48 months. Following two consecutive tests with bypass leakage greater than its limit, the test frequency is once every 24 months until two consecutive tests are less than or equal to the bypass leakage limit.

The last DWBT was successfully conducted in October 19, 2008. The licensee is requesting a change to conduct the next DWBT performed after the October 19, 2008, test, no later than the plant restart after the EOC 22 RFO.

The purpose of the change is to make the DWBT test coincide with the Appendix J, Type A test, because the two tests share test equipment and system lineups. Thus, the licensee has accompanied its request for a one-time Type A test interval extension to 11.5 years with a request for a one-time extension of the DWBT interval to 11.5 years.

The NRC staff has previously approved similar extension requests for DWBT on the basis that the likelihood of significant bypass leakage is acceptably low, based on the results of previous DWBT test results, and other monitoring indicative of drywell boundary integrity.

In support of the proposed change, the licensee provided historical DWBT results in Table 3.3.4.1, "Drywell Bypass Leakage Rate Testing (DWBT) History," in Attachment 1 of the LAR. The results include 11 drywell bypass leakage tests, including 4 pre-operational tests. All of the results show drywell bypass leakage rates significantly lower than 10 percent of the analyzed design limit.

Amendment No. 126, issued on August 1, 1996 (ADAMS Accession No. ML021480466), allowed for a performance-based drywell bypass leakage for GGNS. Based on the NRC staff's request to monitor the drywell leakage for any significant leakage in between DWBTs, GGNS has committed to assess leak tightness of the drywell at least once each operating cycle. The licensee stated that this assessment is performed every quarter when each of the drywell purge compressors is operated for greater than or equal to (≥) 15 minutes, in accordance with SR 3.6.3.3.2 of TS 3.6.3.3 "Drywell Purge System." During this surveillance test, the drywell purge compressors force air from the primary containment to the drywell, thus pressurizing the drywell. The drywell assessments consider whether a compressor is capable of increasing the pressure in the drywell. In the SE for Amendment No. 126, the NRC staff concluded that the proposed method provided reasonable assurance that the TS value of drywell bypass leakage would not be exceeded, and that regular monitoring of drywell leakage helps ensure that there is no significant undetected degradation of the drywell. By Amendment No. 164, the NRC staff approved a one-time extension of the DWBT from 10 years to 15 years, concurrent with a one-time ILRT test interval extension from 10 to 15 years. The licensee indicated that it will continue to assess the drywell leak tightness at least once per operating cycle.

In the current LAR by letter dated December 29, 2016, the licensee restated that GGNS will continue to monitor and assess the drywell for leak tightness every quarter by making use of the of the drywell purge compressors. Based on the margins in the historical DWBT test results and the regular drywell monitoring and assessments performed for drywell leakage in between the DWBT tests, the NRC staff concludes that extending the DWBT frequency from 10 to 11.5 years is acceptable.

3.3 Containment Inservice Inspection (ISI) Program

GGNS is designed with a General Electric Company BWR enclosed by a Mark III type pressure suppression containment system consisting of a vapor suppression pool, and a primary containment structure designed to divert the energy released during a design-basis, large break LOCA. The drywell communicates with the primary containment through a series of horizontal vents in the drywell wall. The vents are covered both inside and outside the drywell by water from the annular-shaped suppression pool, which forms a seal between the drywell and the primary containment. The drywell contains the reactor coolant system and other high energy piping systems. The inspections associated with this program are limited to the primary containment structure and its appurtenances. Inspections of the drywell are outside the scope of this program plan. The GGNS containment is discussed in Section 6.2 of the GGNS Updated Final Safety Analysis Report.

The licensee stated that it is implementing its CISI Program in accordance with the applicable edition/addenda of Subsections IWE/IWL of Section XI, Division 1, of the ASME Code, subject to the applicable regulatory conditions as required by 10 CFR 50.55a(g)(4)(iv), "Applicable ISI

Code: Use of subsequent editions and addenda." The ASME Code of Record for the CISI Program during the third interval is the 2001 Edition with the 2003 Addenda. Subsection IWL provides the rules and requirements for inservice inspection of Class CC (concrete containment) components. Subsection IWE provides the rules and requirements for inservice inspection of Class MC (metal containment) pressure-retaining components and requires general visual examination of 100 percent of accessible metallic surfaces of the containment pressure boundary three times over a 10-year inspection interval, pursuant to 10 CFR 50.55a(b)(2)(ix)(E), "Metal containment examinations: Fifth provision."

Pursuant to IWL-2410(a) and (c), general visual examinations of accessible surfaces of containment concrete and post-tensioning system components of the containment are conducted every 5 years, which would be two examinations over a 10-year interval. The licensee performs general visual examinations for Subsection IWE in accordance with Program Section, "General Visual Examinations of Class MC Components," and general and detailed examinations for Subsection IWL in accordance with "General and Detailed Visual Examinations of Concrete Containments." In the LAR by letter dated December 29, 2016, the licensee provided a summary of results of IWE and IWL inspections performed in the third (current) CISI interval including IWE augmented examinations of containment surface areas using appropriate methods specified in Subsection IWE. However, the LAR did not provide the results of any of the recent IWL inspections, nor the IWE inspection performed prior to RFO 20.

In its August 25, 2017, response to the NRC staff's request for additional information (RAI) ESEB RAI-1, the licensee provided a discussion of the results for the IWE inspection performed prior to RFO 20 and the results for the last two IWL inspection periods. The RFO 20 (March 2016) IWE inspection results were provided in LAR Table 3.3.9-2. The licensee stated the IWE inspection performed prior to RFO 20 was performed during RFO 19 (March 2014), and the results are provided in Attachment 2 to the licensee's RAI response. The results of the RFO 19 and RFO 20 visual inspections were characterized by the licensee as "Items were previously identified and evaluated. No additional degradation noted." Areas inspected included visual inspection of the containment building dome and liner, underwater surfaces of the suppression pool, and the upper and lower personnel airlock. Indications noted during the suppression pool liner inspection were determined acceptable by examination in accordance with ASME IWE requirements. Five areas were documented with noted degradations, however the minimum plate thickness for all five areas remained above the nominal plate thickness of 0.225 - .0250 inches. The inspection results for the last two IWL visual inspections performed in RFO 18 (April 2012) and RFO 20 were characterized by the licensee as "Indications were previously identified and evaluated with no changes." The results were provided in Attachment 3 to the licensee's RAI response. The NRC staff finds the licensee's response to the RAI to be acceptable because it demonstrated additional satisfactory performance of CISI test results in addition to that provided in the LAR. Additionally, the GGNS CISI program is consistent with the guidance of NEI 94-01, Revision 3-A, and the staff's April 26, 1995, SE.

The LAR identified IWE augmented examination of containment surface areas requiring Category E-C examination. Table 3.3.8-4 in Attachment 1 of the LAR listed five component identification numbers associated with the containment liner plate and five areas associated with the suppression pool liner that required ultrasonic examination. Based on Table 3.3.9-2 in Attachment 1 of the LAR, suppression pool underwater surface indications resulted in a metal loss between 9-55 thousandths of an inch (mils), which was determined by GGNS Engineering to be acceptable.

The licensee also indicated that it evaluates potential degradation in inaccessible areas in accordance with the regulatory conditions in 10 CFR 50.55a(b)(2)(viii)(E), "Concrete containment examinations: Fifth provision," and 10 CFR 50.55a(b)(2)(ix)(A), "Metal containment examinations: First provision." The NRC staff finds that the licensee is appropriately crediting the CISI inspections to meet the 10 CFR Part 50 Appendix J visual inspection requirements. The NRC staff finds that the licensee's CISI implementation plan and schedule, and the described disposition of inspection findings indicate that the licensee is implementing its CISI program satisfactorily to ensure that potential containment degradations are adequately monitored and managed. The staff also finds that the CISI program is unaffected by the proposed amendment and will continue to provide reasonable assurance that any containment degradation will be detected and corrected before it can result in a leakage path.

Based on the above, the NRC staff finds that the licensee has an adequate CISI program and procedures in place to periodically examine, monitor and manage structural deteriorations and aging degradation of the pressure-boundary components of the GGNS containment. The staff also notes that the licensee has satisfactorily monitored implementation of these programs.

3.4 Risk Insights

In Section 3.5, "Plant-Specific Confirmatory Analysis," in Attachment 1 of the LAR by letter dated December 29, 2016, the licensee provided a plant-specific confirmatory risk assessment of the proposed changes. However, the NRC staff approval of this license amendment request is based on the deterministic aspects of the structural and leak-tight integrity of the containment, and the licensee's implementation of its leak rate testing program and CISI program for management of containment degradation. Accordingly, the NRC staff did not find it necessary to review, and therefore did not review, the licensee's risk assessment provided in the LAR in its evaluation of the proposed TS changes.

3.5 Technical Evaluation Summary

The NRC staff finds that, since the licensee is satisfactorily monitoring and managing the GGNS containment, and performing supplemental inspections to periodically examine and monitor aging degradations, there is reasonable assurance that the containment structural and leak-tight integrity will continue to be maintained during the requested one cycle extension period until the next Type A test. The licensee justified the proposed changes to extend the performance-based Type A test interval by demonstrating adequate performance of the containment, based on plant-specific Type A test program results. Additionally, Type B and Type C test results demonstrate a history of adequately managing the leakage rates of the GGNS containment, thereby continuing to provide a high degree of assurance that containment leak-tight integrity is maintained if the Type A test is extended as proposed.

The NRC staff also considered the February 17, 2016, NRC approval of the licensee's request to permanently extend Type B and Type C local leakage rate testing frequency, and the satisfactory implementation of the CISI (IWE/IWL) and Containment Leak Rate Aging Management Programs related to the NRC's 2016 approval of the GGNS license renewal application. Therefore, the NRC staff finds it acceptable to grant the proposed TS 5.5.12 revision, as proposed by the licensee, to allow a one cycle extension of the current 10-year Type A ILRT interval to 11.5 years.

In addition, the NRC staff finds that the margins shown in the past drywell bypass leakage tests, continued licensee assessments of the drywell bypass leakage during quarterly tests of the

drywell purge compressors, and an effective implementation of the ISI program will support a 1.5 year extension to the next DWBT.

Other than stating the exceptions to the next Type A and drywell bypass leak rate test intervals, the proposed changes will have no other impact on SR 3.6.5.1.1 and TS 5.5.12. The TSs will continue to meet the requirements of 10 CFR 50.36(c)(3) and 10 CFR 50.36(c)(5). Therefore, the NRC staff finds that the proposed changes are acceptable. This is a one-time interval extension and subsequent Type A and drywell bypass leakage tests must be conducted within the normal prescribed intervals, unless NRC approval is obtained for future extensions.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Mississippi State official was notified of the proposed issuance of the amendment on December 11, 2017. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes a surveillance requirement. The NRC staff has determined that the amendment involves 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 amendment involves no significant hazards consideration, and there has been no public comment on such finding published in the *Federal Register* on May 23, 2017 (82 FR 23625). Accordingly, the amendment meets 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 amendment.

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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: December 29, 2017

SUBJECT: GRAND GULF NUCLEAR STATION, UNIT 1 – ISSUANCE OF AMENDMENT RE: ONE CYCLE EXTENSION OF APPENDIX J TYPE A INTEGRATED LEAKAGE TEST AND DRYWELL BYPASS TEST INTERVAL (CAC NO. MF9461; EPID L-2016-LLA-0040) DATED DECEMBER 29, 2017

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