



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

February 17, 2016

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: REVISION OF TECHNICAL SPECIFICATIONS FOR CONTAINMENT
LEAK RATE TESTING (CAC NO. MF6310)**

Dear Sir or Madam:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 209 to Facility Operating License No. NPF-29 for the Grand Gulf Nuclear Station, Unit 1 (GGNS). This amendment consists of changes to the technical specifications (TSs) in response to your application dated May 27, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15147A599), as supplemented by letters dated October 28, 2015 (ADAMS Accession No. ML15302A042), and December 10, 2015 (ADAMS Accession No. ML15345A008).

The amendment revises the GGNS TSs to allow for a permanent extension of the Type C leakage rate testing frequency and reduction of the Type B and C grace intervals that are required by GGNS TS 5.5.12, "10 CFR 50, Appendix J, Testing Program," by including a reference to Nuclear Energy Institute (NEI) Topical Report, NEI 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 2012. In addition, the amendment changed Surveillance Requirement (SR) 3.6.5.1.1 by deleting the information regarding the performance of the last Type A test that has already occurred. This amendment does not alter the Type A testing frequencies nor any other requirements as specified in the existing GGNS TS.

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

Sincerely,

A handwritten signature in black ink, appearing to read "James S. Kim". The signature is fluid and cursive, with a long horizontal stroke at the end.

James S. Kim, Project Manager
Plant Licensing IV-2 and Decommissioning
Transition Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosures:

1. Amendment No. 209 to NPF-29
2. Safety Evaluation

cc w/encls: Distribution via Listserv



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

ENERGY OPERATIONS, INC.
SYSTEM ENERGY RESOURCES, INC.
SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION
ENERGY MISSISSIPPI, INC.
DOCKET NO. 50-416
GRAND GULF NUCLEAR STATION, UNIT 1
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 209
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 May 27, 2015, as supplemented by letters dated October 28, 2015, and December 10, 2015, 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.

Enclosure 1

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 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. 209 are hereby incorporated into this 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 within 30 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Meena K. Khanna, Chief
Plant Licensing IV-2 and Decommissioning
Transition Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Date of Issuance: February 17, 2012

ATTACHMENT TO LICENSE AMENDMENT NO. 209

FACILITY OPERATING LICENSE NO. NPF-29

DOCKET NO. 50-416

Replace the following pages of the 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
4

INSERT
4

Technical Specifications

REMOVE
3.6-53
5.0-16

INSERT
3.6-53
5.0-16

- (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 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. 209 are hereby incorporated into this 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
<p>SR 3.6.5.1.1 Verify bypass leakage is less than or equal to the bypass leakage limit.</p> <p> However, during the first unit startup following drywell bypass leak rate testing performed in accordance with this SR, the acceptance criterion is leakage \leq 10% of the bypass leakage limit.</p>	<p>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</p> <p><u>AND</u></p> <p>48 months following a test with bypass leakage greater than the bypass leakage limit</p> <p><u>AND</u></p> <p>-----NOTE----- SR 3.0.2 is not applicable for extensions > 12 months. -----</p> <p>120 months</p>

(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. 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," date 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
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 209 TO

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 May 27, 2015 (Reference 1), as supplemented by letters dated October 28, 2015 (Reference 2), and December 10, 2015 (Reference 3), Entergy Operations, Inc. (Entergy, the licensee), requested changes to the technical specifications (TSs) for Grand Gulf Nuclear Station, Unit 1 (GGNS). The supplemental letters dated October 28, 2015, and December 10, 2015, 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 September 29, 2015 (80 FR 58516).

The license amendment request (LAR) proposes changes to the GGNS TSs to allow for a permanent extension to the Type C leakage rate testing frequency and reduction of the Type B and C grace intervals that are required by GGNS TS 5.5.12, "10 CFR 50 [Title 10 of the *Code of Federal Regulations*], Appendix J, Testing Program," by including a reference to Nuclear Energy Institute (NEI) Topical Report (TR), NEI 94-01, Revision 3-A, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J," dated July 2012 (Reference 4). The proposed change is consistent with the GGNS performance-based leakage testing programs based on Option B, "Performance-Based Requirements," of 10 CFR 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." In addition, the LAR also proposes an administrative change to Surveillance Requirement (SR) 3.6.5.1.1 by deleting the information regarding the performance of the previous Type A test, as this has already occurred. This LAR does not propose to alter the Type A testing frequencies nor any other requirements as specified in the existing GGNS TS.

2.0 REGULATORY EVALUATION

The regulation in 10 CFR 50.54(o) states, in part, that "the primary reactor containments for water cooled power reactors. . . shall be subject to the requirements set forth in Appendix J to 10 CFR Part 50." The regulations in 10 CFR Part 50, Appendix J includes two options: "Option A – Prescriptive Requirements," and "Option B – Performance-Based Requirements," either of which can be chosen for meeting the requirements of the Appendix. The testing

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

Option B of 10 CFR Part 50, Appendix J specifies performance-based requirements and criteria for preoperational and subsequent leakage-rate testing. These requirements are met by performance of: (a) Type A tests to measure the containment system overall integrated leakage rate; (b) Type B pneumatic tests to detect and measure local leakage rates across pressure-retaining leakage-limiting boundaries such as penetrations; and (c) Type C pneumatic tests to measure Containment Isolation Valve (CIV) leakage rates. After the preoperational 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 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.

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 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.

The regulations in 10 CFR 50.55a, "Codes and standards," contains the containment in-service inspection 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(a)(1), "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, . . . are capable of fulfilling their intended functions. These goals shall be established commensurate with safety and, where practical, take into account industrywide operating experience."

The regulation in Criterion 50, "Containment design basis," of 10 CFR Part 50 Appendix A, "General Design Criteria for Nuclear Power Plants," states:

The reactor containment structure, including access openings, penetrations, and the containment heat removal system shall be designed so that the containment structure and its internal compartments can accommodate, without exceeding the design leakage rate and with sufficient margin, the calculated pressure and temperature conditions resulting from any loss-of-coolant accident. This margin shall reflect consideration of (1) the effects of potential energy sources which have not been included in the determination of the peak conditions, such as energy in steam generators and as required by § 50.44 energy from metal-water and other chemical reactions that may result from degradation but not total failure of emergency core cooling functioning, (2) the limited experience and experimental data available for defining accident phenomena and containment responses, and (3) the conservatism of the calculational model and input parameters.

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

GGNS TS 5.5.12 "10 CFR 50, Appendix J, Testing Program" states, in part, that "The calculated peak containment internal pressure for the design basis loss of coolant accident, P_a , is 12.1 psig [per square inch gauge]."

As required by 10 CFR 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 (\leq) 1.0 L_a . However, following testing during the first unit startup, performed in accordance with 10 CFR 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 regulation in 10 CFR 50, Appendix J, Option B, Section V.B.3, states, in part, 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 technical specifications.

The current licensing basis for GGNS 10 CFR 50, Appendix J Test Program is, as follows:

On April 6, 1998, the NRC issued Amendment No. 135 (Reference 5), which revised the TSs for GGNS to permit the implementation of the containment leak rate testing provisions of 10 CFR Part 50, Appendix J, Option B. The amendment, in part, consisted of adding GGNS TS 5.5.12, "10 CFR 50, Appendix J, Testing Program". Option B requires that the regulatory guide or other implementation document used by a licensee to develop a performance-based leakage rate testing program must be included by general reference in the plant TSs. The licensee chose not to reference Regulatory Guide (RG) 1.163 "Performance-Based Containment Leak-Rate Testing Program" (Reference 6) in the GGNS TSs. Instead, Entergy revised the TSs to reference the NRC staff safety evaluation report (SER) that was the basis for the earlier exemption from the Appendix J requirements granted to GGNS. The exemption, from what is now, Option A to Appendix J, was approved by the NRC staff by letter dated April 26, 1995 (Reference 7). 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 systems, structures and components involved. The test methods and criteria for containment leakage rate testing used by the licensee were not affected by this exemption. The technical basis and the TS changes approved by the GGNS exemption were used by the NRC staff, along with the staff's own studies, in the development of Appendix J, Option B. This exemption expired following GGNS startup following Refueling Outage 9 (spring 1998).

The NRC's safety evaluation (SE) for Amendment No. 135 states, in part, "[t]he NRC's April 26, 1995, SER limited the test intervals for Types B and C testing to 5 years." With the NRC's issuance of Amendment No.135, GGNS was allowed to extend the Type B test interval to 10 years and keep the Type C interval at 5 years. This is consistent with the guidance of RG 1.163, which allows:

- a. a Type A test frequency of at least one Type A test in 10 years based upon two consecutive successful tests;
- b. that Type B tests may be extended up to a maximum interval of 10 years based upon completion of two consecutive successful tests; and
- c. that Type C tests may be extended up to 5 years based on two consecutive successful tests.

On January 28, 2004, the NRC staff issued Amendment No. 164 (Reference 8), which changed TS 5.5.12 regarding Type A containment integrated leakage rate testing (ILRT). The change allowed for a one-time extension of the interval from 10 to 15 years for performance of the next ILRT.

On July 18, 2012, the NRC staff issued Amendment No. 191 (Reference 9), which represented an extended power uprate (EPU) for GGNS. The operating license was also amended to include a new license condition that required future leak rate tests starting in Refueling Outage 18 (i.e., fall 2012) and thereafter, be performed at the EPU calculated peak containment pressure or within EPU drywell bypass leakage limits, as appropriate. Amendment No. 191 changed the license basis "P_a" of 11.5 psig to 14.8 psig.

On August 31, 2015, the NRC staff issued Amendment No. 205 (Reference 10), which allows plant operation from the currently licensed Maximum Extended Load Line Limit Analysis (MELLLA) domain to plant operation in the expanded MELLLA Plus (MELLLA+) domain under the previously approved EPU. Following implementation of Amendment No. 205, which was effective on January 27, 2016, the license basis "P_a" of 14.8 psig changed to 12.1 psig.

3.0 TECHNICAL EVALUATION

3.1 Licensee's Proposed Changes

In the LAR (Reference 1), the licensee proposed changes to the GGNS TSs to allow for a permanent extension to the Type C leakage rate testing frequency from up to 60 months to up to 75 months and reduction of the Type B and C grace intervals that are required by TS 5.5.12 from 15 months to 9 months, by including a reference to NEI 94-01, Revision 3-A (Reference 4). In addition, the LAR also proposes an administrative change to SR 3.6.5.1.1 that was approved by the NRC in Amendment No. 164 (Reference 8), by deleting the information regarding the performance of the next Type A test no later than November 23, 2008, as this has already occurred.

The current GGNS TS 5.5.12 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, except that the next Type A test performed after the November 24, 1993 Type A test shall be performed no later

than November 23, 2008. 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. The calculated peak containment internal pressure for the design basis loss of coolant accident, P_a , is 12.1 psig.

The revised GGNS TS 5.5.12 would state:

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 C local leak 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, P_a , is 12.1 psig.

The surveillance frequency of GGNS TS 3.6.5.1 "Drywell" is being revised for consistency with the deletion of the Type A test information related to performance of no later than November 23, 2008, which was approved by Amendment No. 164 (Reference 8), as this has occurred in the past and is no longer necessary information for inclusion in this TS. This administrative change has no impact on the testing requirements of the GGNS 10 CFR 50, Appendix J, Testing Program. GGNS SR 3.6.5.1.1 will be changed to state, in part (**deletion in Bold**):

SURVEILLANCE

SR 3.6.5.1.1-Verify that 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 \leq 10% of the bypass leakage limit.

FREQUENCY

120 months, ~~except that the next drywell bypass leak rate test performed after the November 24, 1993 test shall be performed no later than November 23, 2008~~

Consistent with the guidance in NEI 94-01 Revision 3-A (Reference 4), in its request as supplemented, the licensee justified the proposed changes by demonstrating adequate performance of the GGNS containment based on: (a) the historical plant-specific containment LLRT program results; (b) the "Performance Factors" identified in Section 11.3.1 of NEI 94-01

Revision 3-A; and (c) the "Programmatic Controls" identified in Section 11.3.2 of NEI 94-01 Revision 3-A.

The proposed changes of the LAR impact neither the Type A testing frequency nor the Type A testing requirements as specified in the existing GGNS TS.

3.2 NRC Staff's Evaluation

The NRC staff reviewed the LAR and its supplements from the point of deterministic considerations with regard to containment leak-tight integrity should the current TS 5.5.12 LLRT Type C Test maximum interval be extended from 60 months to 75 months for GGNS. The staff's review focused on three areas:

- Adoption of NEI 94-01, Revision 3-A and conformance with conditions;
- Performance history of Type B and Type C tests; and
- Deletion of dated Type A test information.

3.2.1 Adoption of NEI 94-01, Revision 3-A for Type B and Type C Test Frequencies

As required by 10 CFR 50.54(o), the GGNS Containment is subject to the requirements set forth in 10 CFR 50, Appendix J. Option B of Appendix J allows that test intervals for Type A, Type B, and Type C testing be determined by using a performance-based approach. Currently, the GGNS 10 CFR 50 Appendix J Testing Program is implemented in accordance with the SE issued by the Office of Nuclear Reactor Regulation dated April 26, 1995 (Reference 7) as modified by the SE issued for Amendment No. 135 (Reference 5) to the operating license. The licensee's LAR with its supplements, proposes to revise the GGNS 10 CFR 50, Appendix J Testing Program by incorporating the guidance in NEI 94-01, Revision 3-A to govern the test frequencies and the grace periods for Type B Tests and Type C Tests.

By letter dated June 8, 2012 (Reference 11), the NRC published an SE, with limitations and conditions, for NEI 94-01, Revision 3, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J." In the SE the NRC concludes that NEI 94-01, Revision 3, describes an acceptable approach for implementing the optional performance-based requirements of 10 CFR 50, Appendix J, and is acceptable for referencing by licensees proposing to amend their TSs in regard to containment leakage rate testing, subject to the limitations and conditions identified in the SE, Section 4.0 and summarized in the SE, Section 5.0. NEI 94-01, Revision 3, includes provisions for extending Type C Local Leakage Rate Test intervals to up to 75 months. The accepted version of NEI 94-01, Revision 3 was subsequently issued as Revision 3-A. NEI issued Revision 3-A to NEI TR NEI 94-01 on July 31, 2012. With Revision 3-A (Reference 4), the technical report was revised to incorporate the June 8, 2012, NRC Final SE.

The NRC staff has found that the use of NEI TR 94-01, Revision 3-A is an acceptable reference for use in licensee TSs to extend the Option B to 10 CFR Part 50, Appendix J, Type C LLRT intervals beyond 60 months, provided the following applicable two conditions are satisfied:

Condition 1

NEI TR 94-01, Revision 3, is requesting that the allowable extended interval for Type C LLRTs be increased to 75 months, with a permissible extension (for non-routine emergent conditions) of nine months (84 months total). The staff is allowing the extended interval for Type C LLRTs be increased to 75 months with the requirement that a licensee's post-outage report include the margin between the Type B and Type C leakage rate summation and its regulatory limit. In addition, a corrective action plan shall be developed to restore the margin to an acceptable level. The staff is also allowing the non-routine emergent extension out to 84-months as applied to Type C valves at a site, with some exceptions that must be detailed in NEI 94-01, Revision 3. At no time shall an extension be allowed for Type C valves that are restricted categorically (e.g. BWR [Boiling Water Reactor] MSIVs [Main Steam Isolation Valves]), and those valves with a history of leakage, or any valves held to either a less than maximum interval or to the base refueling cycle interval. Only non-routine emergent conditions allow an extension to 84 months.

In its application, the licensee stated that its post-outage report, as required by Section 12.1 of NEI 94-01, Revision 3-A, will include the margin between the Type B and Type C minimum pathway leak rate summation value, as adjusted, to include the estimate of applicable Type C leakage understatement, and its regulatory limit of 0.60 L_a .

The licensee will complete an analysis and determine the appropriate corrective action plan when the potential leakage understatement adjusted Type B and Type C minimum pathway leak rate total is greater than the GGNS administrative leakage summation limit of 0.50 L_a and less than the regulatory limit of 0.60 L_a . The corrective action plan shall focus on the components, which have contributed the most to the increase in the leakage summation value and the manner of timely corrective action, as deemed appropriate that best focuses on the prevention of future component leakage performance issues.

Consistent with the generic approval in NEI 94-01, Revision 3-A, Entergy stated it will only utilize the 9-month grace period beyond 75 months to eligible Type C components for non-routine emergent conditions, as specified in Reference 1. These occurrences will be documented in the record of tests.

After reviewing these statement's in the licensee's application against the requirements of NEI 94-01, Revision 3-A and Condition 1, the staff finds that the licensee has addressed the requirements to provide a post outage report with leakage rate summations and margin between the regulatory limit, to develop a corrective action plan to restore the margin to an acceptable level, and that any interval extensions to 84 months will not be applied to restricted components.

Accordingly, the NRC staff finds the licensee satisfied Condition 1.

Condition 2

The basis for acceptability of extending the LLRT interval out to once per 15 years was the enhanced and robust primary containment inspection program and the local leakage rate testing of penetrations. Most of the primary containment leakage experienced has been attributed to penetration leakage and penetrations are thought to be the most likely location of most containment leakage at any time. The containment leakage condition monitoring regime involves a portion of the penetrations being tested each refueling outage, nearly all LLRT's being performed during plant outages. For the purposes of assessing and monitoring or trending overall containment leakage potential, the as-found minimum pathway leakage rates for the just tested penetrations are summed with the as-left minimum pathway leakage rates for penetrations tested during the previous 1 or 2 or even 3 refueling outages. Type C tests involve valves which, in the aggregate, will show increasing leakage potential due to normal wear and tear, some predictable and some not so predictable. Routine and appropriate maintenance may extend this increasing leakage potential. Allowing for longer intervals between LLRTs means that more leakage rate test results from farther back in time are summed with fewer just tested penetrations and that total used to assess the current containment leakage potential. This leads to the possibility that the LLRT totals calculated understate the actual leakage potential of the penetrations. Given the required margin included with the performance criterion and the considerable extra margin most plants consistently show with their testing, any understatement of the LLRT total using a 5-year test frequency is thought to be conservatively accounted for. Extending the LLRT intervals beyond 5 years to a 75-month interval should be similarly conservative provided an estimate is made of the potential understatement and its acceptability determined as part of the trending specified in NEI 94-01, Revision 3, Section 12.1.

When routinely scheduling any LLRT valve interval beyond 60-months and up to 75-months, the primary containment leakage rate testing program trending or monitoring must include an estimate of the amount of understatement in the Type B & C total, and must be included in a licensee's post-outage report. The report must include the reasoning and determination of the acceptability of the extension, demonstrating that the LLRT totals calculated represent the actual leakage potential of the penetrations.

Condition 2 contains the following, for the purposes of assessing and monitoring or trending overall containment leakage potential, the as-found minimum pathway leakage rates for the just tested penetrations are summed with the as-left minimum pathway leakage rates for penetrations tested during the previous 1 or 2 or even 3 refueling outages. The as-found and as-left values are as determined by the appropriate testing methodology specifically described in American National Standards Institute/American Nuclear Society (ANSI/ANS) 56.8-2002, Reaffirmed August 9, 2011, "Containment System Leakage Testing Requirements" (Reference 12). Accordingly, GGNS will be adopting, in part, the testing criteria, of ANSI/ANS-56.8-2002 as part of its licensing basis. As stated in Section 2.0, "Purpose and Scope," of NEI 94-01, Revision 3-A, where technical guidance overlaps between NEI 94-01, Revision 3-A and ANSI/ANS 56.8-2002, the guidance of NEI 94-01, Revision 3-A takes precedence.

In its application, the licensee stated that GGNS will conservatively apply a potential leakage understatement adjustment factor of 1.25 to the actual as-left leak rate, which will increase the as-left leakage total for each Type C component on a greater than a 60-month test interval. The licensee will complete an analysis and determine the appropriate corrective action plan when the potential leakage understatement adjusted Type B and Type C minimum pathway leak rate total is greater than the GGNS administrative leakage summation limit of $0.50 L_a$ and less than the regulatory limit of $0.60 L_a$. The corrective action plan shall focus on the components, which have contributed the most to the increase in the leakage summation value and the manner of timely corrective action, as deemed appropriate that best focuses on the prevention of future component leakage performance issues. When the potential leakage understatement adjusted leak rate MNPLR is less than $0.50 L_a$, then the acceptability of the 75-month LLRT extension for all affected Type C components has been adequately demonstrated.

The staff made a request for additional information (RAI)-4 to clarify a non-conservative statement in the licensee's original application regarding to which components the Condition 2 understatement adjustment factor applies. The licensee responded by amending (**changes in BOLD**) the two paragraphs of their application response for Condition 2, Issue 1. In particular, the second sentence in the first paragraph was amended to read: "As such, GGNS will conservatively apply a potential leakage understatement adjustment factor of 1.25 to the actual as-left leak rate, which will increase the as-left leakage total for each Type C component **currently on greater than a 60-month test interval up to the 75-month extended test interval.**" The first sentence of the second paragraph was amended to read in part: "When the potential leakage understatement adjusted leak rate total for those Type C components being tested on **greater than a 60-month test interval up to the 75-month extended test interval** is summed with the non-adjusted total of those Type C components **being tested at less than or equal to a 60-month test interval**, and the total of the Type B ..." In summation, the response to RAI-4 amended the original application to comply with the requirements of the second paragraph of Condition 2 contained in the NRC staff safety evaluation (Section 4.0 "Limitations and Conditions") associated with NEI 94-01, Revision 3-A.

After reviewing the Condition 2 statements in the licensee's application against the requirements of NEI 94-01, Revision 3-A, the staff finds that the licensee has adequately addressed the issue of understatement of as-left MNPLR values for CIVs with test intervals of greater than 60-months. Based on this review and the licensee's response to RAI-4 (Reference 2), the NRC staff finds the licensee satisfied Condition 2.

Evaluation of the Licensee's Adoption of NEI 94-01, Revision 3-A

The NRC staff compared NEI TR 94-01, Revision 3-A (Reference 4) with the SE issued for Amendment No. 135 (Reference 5) to ensure there would be no inconsistencies between the leak rate testing frequencies of specific components. The NRC staff notes that NEI TR 94-01, Revision 3-A acknowledges that there are areas of overlap. For example, NEI TR 94-01, Revision 3-A (Section 10.2), states, "If no plant-specific technical specifications are in effect for BWR and PWR containment purge and vent valves and/or BWR main steam and feedwater isolation valves, the interval for Type C tests should be limited to 30 months." Per the current GGNS SR 3.6.1.3.5 (approved per Amendment 135), "Perform leakage rate testing for each primary containment purge valve with resilient seals every 36 months with at least 2 pairs of

valves tested every 18 months.” In this regard, the NRC staff considers NEI TR 94-01, Revision 3-A to be clear that a plant-specific technical specification would be in effect in this example.

Furthermore, the NRC staff noted in RAI-1 by letter dated September 24, 2015 (Reference 13), that NEI TR, NEI 94-01 Revision 3-A indicates that if a licensee considers an extended test interval of greater than 60 months, the review to establish the surveillance test intervals should include programmatic controls to provide additional assurance that the increased probability of component leakage is kept to a minimum. However, in the LAR (Reference 1), Attachment 1, “Evaluation of the Proposed Changes,” it did not address how the recommended “additional considerations” (i.e., “as-found tests,” “schedule,” and “review”) of Section 11.3.2 “Programmatic Controls” were applied to the Type B and Type C LLRT data contained in the LAR, Attachment 1, Tables 3.3.1-1 and 3.3.1-2. The staff requested that the licensee provide additional information related to the programmatic controls that will be used to support extended Type C LLRT test intervals beyond 60 months.

The licensee responded on October 28, 2015 (Reference 2), that per the guidance in NEI 94-01, GGNS addressed the programmatic controls during its eligibility analysis performed for each potentially eligible Type C component. The documentation from the eligibility analysis is available for internal/external review in accordance with NEI 94-01, Revision 3-A, Section 12.2, “Records”. The licensee’s response explained how it addressed programmatic controls, which includes “as found tests,” “schedule,” and “review,” in its eligibility analysis.

The NRC staff reviewed the GGNS programmatic controls against the guidance of NEI 94-01, Revision 3-A, Section 11.3.2 (Reference 4). Entergy’s response indicates that prior to establishing extended test intervals beyond 60 months for CIVs, GGNS (1) will require three successive successful periodic as-found tests; (2) ensure that the resultant schedule is such that an approximate evenly distributed number of CIVs are tested each refueling outage; and (3) has already reviewed the entire process including performance history, data analysis, surveillance frequencies and risk-impact assessment. These three requirements are concisely the Program Requirements stipulated in Section 11.3.2, “Programmatic Controls.” Based on the review of the response to RAI-1 (Reference 2), the staff concludes that Entergy has established its intent for GGNS to comply with NEI 94-01 Revision 3-A, Section 11.3.2.

Based on the above and evaluations of Condition 1 and Condition 2, the NRC staff determined that the licensee has adequately addressed and satisfied both conditions identified in Section 4.0 of the NRC’s SE for NEI TR, NEI 94-01, Revision 3-A (Reference 4). Therefore, the staff finds it acceptable for GGNS to adopt NEI TR, NEI 94-01, Revision 3-A, as the implementation document in TS 5.5.12 for Type B and C local leak rate testing.

3.2.2 Evaluation of Performance History

The licensee justified the proposed changes to extend the GGNS performance-based Type C test intervals by demonstrating adequate performance of the GGNS Containment based on plant-specific containment Type B test and Type C test program results. The NRC staff performed a deterministic review of the information and guidelines contained in References 1, 2, 3, and 4 to determine whether, given repetitive acceptable individual valve performance, the GGNS license basis LLRT Type C maximum test interval of 60 months could be extended to 75 months.

GGNS TS SR 3.6.1.1.1 establishes the maximum limit for GGNS startup following completion of Type A testing at less than 0.75 L_a , which equals less than 0.5115 percent of containment air weight per day. SR 3.6.1.1.1 also establishes the maximum limit for GGNS startup following completion of aggregate Type B and Type C testing at less than 0.6 L_a , which equals less than 0.4092 percent of containment air weight per day. In accordance with GGNS TS 1.1, "Definitions," the GGNS containment was designed for a leakage rate L_a not to exceed 0.682 percent by weight of containment air per 24 hours at the calculated peak pressure, P_a . Both Section 3.3.1 of the LAR by letter dated May 27, 2015, and GGNS TS 5.5.12 program requirements, indicate that the maximum allowable pathway aggregate total for Type B and Type C leakage is less than 0.6 L_a , where 0.6 L_a equates to less than 198,000 standard cubic centimeter per minute (sccm). It follows that, L_a equals 330,000 sccm.

GGNS Type B Test and Type C Test Performance History

The test data results in Table 3.3.1-1 "Types B and C LLRT Combined As-Found [AF]/As-Left [AL] Trend Summary" in the LAR dated May 27, 2015, has been duplicated below in Table 3.2.2-1: Table 3.2.2-1 provides the LLRT data trend summaries for GGNS since 2005 and encompasses the previous LLRT 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 5.5.12 limit of less than 0.6 L_a (less than 198,000 sccm).

Table 3.2.2-1, Types B and C LLRT Combined As-Found/As-Left Trend Summary

RFO	2005	2007	2008	2010	2012	2014
AF Min Path (sccm)	5918	12,885	18,984	18,057	24,453	21,595
Fraction of L_a (%)	1.79	3.9	5.75	5.47	7.41	6.54
AL Max Path (sccm)	20,288	18,389	57,793	69,850	93,069	79,014
Fraction of L_a (%)	6.15	5.57	17.51	21.17	28.2	23.94
AL Min Path (sccm)	3,027	2,189	23,457	25,065	30,415	35,054
Fraction of L_a (%)	0.92	0.66	7.11	7.60	9.22	10.62

The LLRT results displayed in Table 3.2.2-1 demonstrates a history of adequately managing the leakage rates of the GGNS Containment Type B and Type C penetrations.

The NRC staff notes that on July 18, 2012, the NRC approved GGNS License Amendment No. 191 (Reference 9), which allowed the licensee to increase the maximum steady state reactor core power level by approximately 15 percent from the original licensed thermal power level of 3,833 megawatts thermal (MWt). Amendment No.191 represented an EPU for GGNS. The operating license was also amended to include new License Condition 2.C.(44), which

states, in part, that “[l]eak rate tests associated with Surveillance Requirements (SRs) . . . required by TS 5.5.12 . . . are not required to be performed until their next scheduled performance dates.” License Condition 2.C.(44) required that all future leak rate tests starting in Refueling Outage 18 (i.e., fall 2012) and thereafter, be performed at the EPU calculated peak containment pressure or within EPU drywell bypass leakage limits, as appropriate. Amendment No. 191 changed the license basis “P_a” of 11.5 psig to the current licensing basis (CLB) “P_a” of 14.8 psig. Furthermore, following implementation of Amendment No. 205 (Reference 10), the licensing basis “P_a” will change to 12.1 psig.

Based on the timing of the issuance of the EPU License Amendment No. 191 dated July 18, 2012, and on Entergy’s LAR (Reference 1), the NRC staff requested additional information in RAI-2 (Reference 13) regarding the LLRT P_a values used to perform Type B and Type C tests contained in Table 3.2.2-1, above.

The licensee’s response to RAI-2 (Reference 2), expanded on the information contained in the LAR. Specifically, the licensee states, in part:

“ . . . Refueling Outage RF-18 occurred in the spring of 2012. Thirty-two (32) of the 78 component Type B tests and 143 of the 151 component Type C tests were performed at the CLB P_a value of 14.8 psig during 2012 (RF-18) and 2014 (RF-19). These values include Type B and C component tests performed during Cycle 19 (Operating Modes 1, 2 or 3).

“ . . . The last 10 CFR 50, Appendix J, Type A ILRT performed on the containment at GGNS was in 2008. The ILRT leakage (i.e., total of Type A+B+C) rate for this ILRT was 120,624 sccm. The range of the containment internal test pressure, P_a, during this ILRT was 12.48 psig to 12.5 psig.”

From a review of the documents that supported Amendment No. 191 (Reference 9), the NRC staff, in RAI-3 (Reference 13), noted that correspondence from Entergy to the NRC dated August 24, 2011 (Reference 14) predicted an increase in the total Type B + Type C leakage rate of 13.75 percent (i.e., 0.182 ÷ 0.160), because of the change in the license basis “P_a” of 11.5 psig to the CLB “P_a” of 14.8 psig. The staff went on to note that upon review and analysis of the data contained in Table 3.2.2-1 that the aggregate “AF Min Path” Type B +Type C LLRT leakage has gone up by 65 percent since the NRC issued License Amendment No. 191.

$$\{(24453+21595) \div 2\} \div \{(5918 + 12885 + 18984 + 18057) \div 4\} = 1.65$$

Similarly from the data contained in Table 3.2.2-1, larger ratios of 2.57 for the “AL Max Path” and 2.43 for the “AL Min Path” were obtained. The NRC staff requested that the licensee provide an explanation of these ratios in light of the prediction.

Entergy responded, in part, by invoking an excerpt from Enclosure 2 of the NRC SE associated with Amendment No. 191. Specifically, in Section 3.1.2 of Enclosure 2, “Leak Rate Test: New License Condition 2.C.(44),” the licensee proposed to perform the 10 CFR 50 Appendix J testing per TS SRs 3.6.1.1.1, 3.6.1.3.5, and 3.6.1.3.9 at the revised value of P_a (14.8 psig) at the next scheduled test date instead of at the time of EPU implementation. The licensee

justified this proposal by an evaluation demonstrating that the leakage test results, based on a former P_a (11.5 psig), would still be expected to satisfy the appropriate acceptance criteria when tested at the EPU value of P_a (14.8 psig). The NRC staff considered the evaluation acceptable because the licensee has shown that the predicted leakages at the EPU value of P_a of 14.8 psig are bounded by the acceptable leakage limits per 10 CFR 50 Appendix J. The NRC staff notes that the new P_a of 12.1 psig will also be bounded by the acceptable leakage limits per 10 CFR 50, Appendix J.

The licensee concluded its response to RAI-3 (Reference 2) by emphasizing that the extrapolated data contained in the August 24, 2011, correspondence, was only valid for the single point in time that it was performed. The licensee states, in part, that the "... use of this extrapolated value as a predictor of future ILRT and LLRT results is inappropriate and is outside the scope of the information provided by the e-mail." The licensee concluded that major contributors to the increase in LLRT leakage during RF-18 and RF-19 (i.e., since EPU implementation) were identified and discussed in LAR Table 3.3.1-2 "Types B and C LLRT Program Implementation Review."

The NRC staff notes that, as displayed in Table 3.2.2-1 of this SE and in Table 3.3.1-1 in the LAR (Reference 1), the Types B and C test results from 2005 through 2014 has shown an adequate amount of margin between the actual as-found and as-left outage summations and the regulatory requirements as described below:

- The as-found minimum pathway leak rate average for GGNS shows an average of 8.58% of $0.6 L_a$ with a high of 12.35% of $0.6 L_a$ or $0.074 L_a$.
- The as-left maximum pathway leak rate average for GGNS shows an average of 28.49% of $0.6 L_a$ with a high of 47.0% of $0.6 L_a$ or $0.282 L_a$.

Furthermore, with respect to the data contained in Table 3.2.2-1, the "as-found" minimum pathway summations represent the high quality of maintenance of Types B and 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.

The licensee's response provided a well-reasoned explanation for the ratios derived by the staff and demonstrated that the leakage rates associated with a P_a value of 14.8 psig are bounded by acceptable limits under Appendix J. Moreover, the NRC Staff's review of Table 3.2.2-1 shows an adequate margin between test results and regulatory requirements. Therefore, the NRC staff finds the licensee's response to be comprehensive, substantive, and acceptable."

The LAR, Section 3.3.2, "Type B and Type C Tested Components on Extended Intervals," indicates that currently for GGNS:

- The percentage of the total number of Type B tested components (78) that are on 120-month extended performance-based test interval is 65%;
- The percentage of the total number of Type C tested components (151) that are on 60-month extended performance-based test interval is 58%.

The NRC staff noted in RAI-5 (Reference 13), that the adoption of NEI 94-01, Revision 3-A, as the 10 CFR 50, Appendix J implementation document, would establish a new licensing basis for the GGNS TS 5.5.12. Based on this, the NRC staff inquired about the licensee's intent with respect to the Type B and Type C testing frequencies employed after its transition from its CLB to the requirements of NEI 94-01, Revision 3-A.

The licensee's response to RAI-5 (Reference 2), indicated that Entergy neither plans to re-baseline the subset of Containment Type B penetrations currently on the 120-month test interval, nor plans to re-baseline the subset of Containment Type C CIV penetrations currently on the 60-month extended performance-based test interval. For those Type B penetrations currently on its maximum test interval of 120 months, the test interval will not change while each Type C CIV currently on its maximum test interval of 60 months would be evaluated for an extension of its test interval to 75 months. For those Type B components currently not on an extended interval, the current LLRT schedule will continue to be implemented to determine as-found test results and to further assess eligibility for interval extension up to the maximum allowed 120 months. For those Type C components currently not on an extended interval, the current LLRT schedule will continue to be implemented to determine as-found test results and to further assess eligibility for interval extension up to the maximum allowed 75 months. The criteria used when determining eligibility for Type B and Type C interval extensions will be at least two successive, successful as-found LLRT tests.

Going forward, the licensee's response to RAI-5 adequately justifies Entergy's decision of not re-baselining the subset of Containment Type B and Type C penetrations currently on their maximum extended frequencies. Succinctly the NRC staff finds the response to be acceptable since it is consistent with the provisions contained in the NRC staff's SE for GGNS Amendment No. 191 (Reference 9, Enclosure 2), the scheduling and performance requirements of GGNS License Condition 2.44(C) and the "Schedule" criteria of NEI 94-01, Revision 3-A, Section 11.3.2.

As noted above, the LAR, Section 3.3.2, states, in part, "[t]he percentage of the total number of GGNS Type B tested components (78) that are on 120-month extended performance-based test interval is 65%." In RAI-6 (Reference 13), the NRC staff noted that this implies that 35 percent of the total population of Type B penetrations did not successfully pass two consecutive Type B tests without failure. However, the staff noted that the LAR, Table 3.3.1-2, does not list any failures of Type B penetration tests for the two most recent GGNS refueling outages (RF-18 and RF-19). The staff requested that the licensee provide the implied additional historical information about the Type B test failures experienced at GGNS since 2005.

Entergy's response to RAI-6 are contained in two supplements by letters dated October 28, 2015 (Reference 2) and December 10, 2015 (Reference 3):

The LAR Table 3.3.1-2 delineates the only as-found LLRT failures that have occurred during RF-18 (2012) and RF-19 (2014), all of which were Type C components. Similarly, there have not been any Type B component as-found administrative limit LLRT failures since 2005. [Reference 2]

The 35 percent of total population of Type B penetrations were not excluded from the extended performance-based test interval based on Type B

component test failures. This population of Type B components is limited to the base test interval of 30 months for the following reasons:

- Containment Equipment Hatches are not included in the Performance Based Testing Program due to removal of the hatches during each refueling outage. There is no benefit for placing the hatches on Performance Based Testing frequency (as-found and as-left would be required each refueling outage),
- Containment Airlock Leak Rate Tests are excluded from Performance Based Testing due to the TSs interval limitations, and
- Local Leak Rate Tests performed in conjunction with Technical Specification 5.5.2, Primary Coolant Sources Outside Containment, are performed each refueling cycle due to the Technical Specifications interval limitations. [Reference 3]

The licensee's response to RAI-6 regarding the results of Type B testing for RF-18 and RF-19 explain the results of testing during those two outages and why those results were not specifically detailed in Table 3.3.1-2. The NRC staff finds this response to be acceptable because it provided the implied additional historic information sought by the staff and provides a reasonable explanation as to why that information was not readily apparent in Table 3.3.1-2. The staff finds the licensee's response to be acceptable since it is consistent with the requirements of NEI 94-01, Revision 3-A, and its associated NRC SE.

NEI 94-01, Revision 3-A, Section 11.3.1 requires licensees wanting to extend the LLRT interval beyond 60 months to provide a review of the following five performance factors in the eligibility analysis:

- *Past Component Performance* – A licensee should ensure that leakage rate testing intervals are not extended until plant-specific component performance of two successful consecutive as-found tests are performed.
- *Service* – The licensee's testing program should identify types of components subject to higher leakage rates or sensitive to degradation to establish their testing intervals based on their performance history.
- *Design* – Valve type and penetration design may contribute to leakage. As such, the licensee's review should identify the effect of component design and implementation on leakage rates.
- *Safety Impact* – The relative importance of penetrations can be judged in terms of the potential impact of failure in limiting releases from containment under accident conditions. This relative importance should be considered in the eligibility analysis when determining the test interval.

- *Cause Determination* – For failures identified during an extended test interval, a cause determination should be conducted and appropriate corrective actions identified. Part of a corrective action process should be to identify and address common-mode failure mechanisms.

The NRC staff noted in RAI-7 (Reference 13) that the LAR, Section 3.0, “Technical Evaluation” did not address how the “Performance Factors” of NEI 94-01, Revision 3-A, Section 11.3.1, were to be incorporated into the GGNS “10 CFR 50, Appendix J, Testing Program.” The licensee’s response to RAI-7 (Reference 2), states:

The following NEI 94-01, Revision 3-A, Performance Factors, were addressed during the eligibility analysis performed for each potentially eligible Type C component in GGNS to determine if the extended LLRT interval extension of greater than 60 months but less than 75 months could be implemented. (Please note that the results of the following reviews were documented for retention in accordance with NEI 94-01, Revision 3-A, Section 12.2, Records.):

Past Component Performance: The entire population of CIVs subject to LLRT at GGNS was evaluated to identify successful past performance as determined by the AF leak rate of each successive periodic LLRT being compared to and verified as being less than the associated administrative leakage limit. Three consecutive AF tests were utilized as the acceptance criteria for successful past performance as per section NEI 94-01, Revision 3-A, 11.3.2. This criteria provides an added amount of conservatism and assurance that CIV performance warranted extending the test interval from 60 months to 75 months.

Service: The entire population of CIVs subject to LLRT at GGNS was evaluated to identify LLRT failures as determined by the AF leak rate being greater than the associated administrative leakage limit. For each identified failure, the associated Condition Report, Cause Determination and maintenance work order was reviewed to assess and identify contributions that service conditions, frequency of valve cycling, or age-related degradation mechanisms may have had on the failure. If the review identified any such contributions, they were noted and recommendations were made concerning their impact on eligibility for the extended test interval of 75 months.

Design: The entire population of CIVs subject to LLRT at GGNS was evaluated to identify LLRT failures as determined by the AF leak rate being greater than the associated administrative leakage limit. For each identified failure, the associated Condition Report, Cause Determination and maintenance work order was reviewed to assess and identify contributions that valve design related issues (wrong design for the service conditions, excessive cycling, non-enforcement of vendor recommendations related to maintenance/component life, etc.) may have had on the failure. If the review identified any such contributions, then they were noted and recommendations were made concerning their impact on eligibility for the extended test interval of 75 months.

Safety Impact: The entire population of CIVs subject to LLRT at GGNS was evaluated for safety impact in terms of potential impact of failure in limiting releases from containment under accident conditions. A review of the GGNS Level-1 Model, Revision 3, PSA Summary Report and associated clarification documentation pertaining to the scope of CIVs classified as high-risk, and discussion with the GGNS PRA Engineer determined that the relative importance (risk significance) of a total of four (4) CIVs in the GGNS LLRT population warranted consideration for not extending their LLRT interval to the maximum interval of 75 months. As such, these four (4) CIVs will remain on their current LLRT interval and be excluded from further test interval extensions regardless of future LLRT performance.

Cause Determination: The entire population of CIVs subject to LLRT at GGNS was evaluated to identify LLRT failures as determined by the AF leak rate being greater than the associated administrative leakage limit. For each identified failure, the associated Condition Report, Cause Determination or equivalent corrective action process report was reviewed to assess identification of common-mode failure and creation and implementation of corrective action to prevent failure reoccurrence. If the review identified any deficiencies, they were noted and recommendations were made concerning their impact on eligibility for the extended test interval of 75 months.

The NRC staff reviewed the licensee response for each performance factor in *italics* above against the performance factor requirements as specified in NEI 94-01, Revision 3-A, Section 11.3.1. The staff's evaluation determined that Entergy is fully compliant with these requirements. Accordingly, the NRC staff finds the licensee's response to RAI-7 to be comprehensive and acceptable, since the response demonstrates consistency with the "Performance Factors" established in NEI 94-01, Revision 3-A, Section 11.3.1.

LAR Table 3.3.1-2

LAR Table 3.3.1-2, "Types B and C LLRT Program Implementation Review" (Reference 1), contains a listing of the respective CIV LLRT failures from the last two refueling outages (RF-18 in 2012 and RF-19 in 2014).

From the review of the LAR, Table 3.3.1-2, the NRC staff noted that each Type C CIV LLRT component has an "Administrative Limit SCCM" leakage rate associated with it. In response to RAI-6 (Reference 2), the licensee clarified that the individual CIV Administrative Limits delineated in the LAR, Table 3.3.1-2, are not yet constrained so as to achieve the necessary leakage rate of less than or equal to $0.50 L_a$, consistent with Section 10.2 of NEI 94-01, Revision 3-A (Reference 4) and ANSI/ANS-56.8-2002 (Reference 12). In the response by letter dated October 28, 2015, the licensee states, in part, that "[t]he GGNS pathway administrative limit of $0.50 L_a$ is a separate entity being implemented to provide a margin management tool to the regulatory-based limit of $0.60 L_a$ and used to validate the acceptability of the extension of Type C components to the 75-month maximum LLRT interval." The staff notes that this is acceptable since this administrative constraint is not yet part of the current Appendix J program license basis.

The NRC staff also verified by review of the LAR, Table 3.3.1-2, that when a component fails its LLRT Administrative Limit that the scheduled test interval is set at 24 months. The LAR, Table 3.3.1-2's, data and the "Notes" associated with the "Corrective Action" column demonstrate compliance with the requirements NEI 94-01, Revision 3-A Section 10.2.3 "Type C Test Interval" and provide the staff with assurance that the corrective action process, with respect to LLRT failures, is effectively being managed at GGNS.

Summary of Evaluation of Test Performance History

The NRC staff reviewed the LLRT summaries provided in Table 3.2.2-1 of this SE and noted that the aggregate results for all the Type B and C tests since 2005 were well below the acceptance criteria. The staff reviewed the corrective actions for any valve that failed to meet its LLRT "Administrative Limit" during RF-18 and RF-19, as identified in the LAR, Table 3.3.1-2, and noted that the valves would be tested on the minimum test interval until two successful tests were recorded. The staff also noted that the licensee created an action to investigate the cause of any failed LLRTs noted in the LAR, Table 3.3.1-2, and documented corrective actions that will help ensure accurate record maintenance in the future.

The results of the most recent LLRT of 2008 and recent LLRTs demonstrate acceptable performance of the GGNS containment and demonstrate that the leak-tight integrity of the containment structure is being adequately maintained. Thus, the NRC staff determined that there is reasonable assurance that the leak-tight integrity of the containment, will continue to be maintained, without undue risk to public health and safety, if the current Type C test frequency is extended to a maximum interval of 75 months, in accordance with the guidance of NEI TR, NEI 94-01, Revision 3-A.

3.2.3 Deletion of Dated Type A Test Information

The NRC staff reviewed the licensee's proposed administrative changes to TS 5.5.12 and SR 3.6.5.1.1 that were approved by the NRC in Amendment No. 164 (Reference 8). The licensee proposed to delete the information regarding the performance of the next Type A test no later than November 23, 2008, as this has already occurred. The staff confirmed that these Type A test exceptions are for activities that have already taken place, and therefore, this deletion is solely an administrative action that has no effect on any component and no impact on how the unit is operated.

3.2.4 Summary of NRC Staff's Evaluation

Based on the NRC staff review of the licensee's submittal by letter dated May 27, 2015 (Reference 1), as supplemented by letters dated October 28, 2015 (Reference 2), and December 10, 2015 (Reference 3), and the regulatory and technical evaluations above, the staff finds that there is reasonable assurance that the licensee has addressed the NRC conditions to demonstrate acceptability of adopting NEI TR, NEI 94-01, Revision 3-A and that implementation of this for Type B and C local leak rate testing does not introduce any inconsistencies with the Appendix J test program. The staff also determined that the structural and leak-tight integrity of the GGNS containment will continue to be monitored and maintained, if the current performance based Type C test frequency is extended to a maximum interval of 75 months. Therefore, the staff concludes that it is acceptable for Entergy to: (i) revise GGNS TS 5.5.12 to adopt NEI 94-01, Revision 3-A, as the implementation document for governing all future Type B and Type C

test requirements; (ii) adopt a maximum test interval of 75 months for the Type C tests in accordance with the requirements of NEI 94-01, Revision 3-A; and (iii) remove the dates from the TS 5.5.12 and associated drywell SR 3.6.5.1.1 since these Type A test exceptions are for activities that have already taken place and therefore this deletion is solely an administrative action that has no effect on any component and no impact on how the unit is operated. The staff reiterates that neither the scheduling nor the performance criteria of future GGNS Type A tests and inservice interval inspections are affected by issuance of this amendment.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Mississippi State official was notified of the proposed issuance of the amendment. 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 surveillance requirements. 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 September 29, 2015 (80 FR 58516). The amendment also relates to changes in recordkeeping, reporting, or administrative procedures or requirements. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and 10 CFR 51.22(c)(10). 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

7.0 REFERENCES

1. Mulligan, K., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Application to Revise Technical Specifications for Permanent Extension of Type C Leak Rate Testing Frequency and Reduction of Type B and C Grace Intervals, Grand Gulf Nuclear Station, Docket No. 50-416, License No. NPF-29," dated May 27, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15147A599).
2. Mulligan, K., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Grand Gulf Nuclear Station Response to Request for Additional Information Regarding

License Amendment Request to Revise Technical Specifications for Containment Leak Rate Testing, Grand Gulf Nuclear Station, Unit 1, Docket No. 50-416, License No. NPF-29," dated October 28, 2015 (ADAMS Accession No. ML15302A042).

3. Mulligan, K., Entergy Operations, Inc., letter to U.S. Nuclear Regulatory Commission, "Grand Gulf Nuclear Station Supplemental Response to Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications for Containment Leak Rate Testing, Grand Gulf Nuclear Station, Unit 1, Docket No 50-416, License No. NPF-29," dated December 10, 2015 (ADAMS Accession No. ML15345A008).
4. Nuclear Energy Institute, NEI 94-01, Revision 3-A, dated July, 31, 2012, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J" (ADAMS Accession No. ML12221A202).
5. Donohew, J. N., U.S. Nuclear Regulatory Commission, letter to Mr. Joseph J. Hagan, Entergy Operations, Inc., "Issuance of Amendment No. 135 to Facility Operating License No. NPF-29 – Grand Gulf Nuclear Station, Unit 1 (TAC NO. M99879)," dated April 6, 1998 (ADAMS Accession No. ML021490221).
6. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.163, "Performance-Based Containment Leak-Rate Testing Program," dated September 1995 (ADAMS Accession No. ML003740058).
7. O'Connor, P. W., U.S. Nuclear Regulatory Commission, letter to Mr. C. Randy Hutchinson, Entergy Operations, Inc., "Grand Gulf Nuclear Station, Unit 1 - Issuance of Exemption from the Requirements of 10 CFR Part 50, Appendix J, Section III.D (TAC No. 87209)," dated April 26, 1995 (ADAMS Accession No. ML021480397).
8. Vaidya, B., U.S. Nuclear Regulatory Commission, letter Mr. George A. Williams, Entergy Operations, Inc., "Grand Gulf Nuclear Station, Unit 1 – Issuance of Amendment RE: One-Time Extension of the Integrated Leak Rate Test and Drywell Bypass Test Interval (TAC No. MB8940)," dated January 28, 2004, (ADAMS Accession No. ML040300152).
9. Wang, A. B., U.S. Nuclear Regulatory Commission, letter to Entergy Operations, Inc., "Grand Gulf Nuclear Station, Unit 1 – Issuance of Amendment Re: Extended Power Uprate (TAC No. MF4679)," dated July 18, 2012 (ADAMS Accession No. ML121210020).
10. Wang, A. B., U.S. Nuclear Regulatory Commission, letter to Entergy Operations, Inc., "Grand Gulf Nuclear Station, Unit 1 – Issuance of Amendment Regarding Maximum Extended Load Line Limit Analysis Plus (TAC NO. MF2798)," dated August 31, 2015 (ADAMS Accession No. ML15229A219).
11. Bahadur, S., U.S. Nuclear Regulatory Commission, letter to Mr. Biff Bradley, Nuclear Energy Institute, "Final Safety Evaluation of Nuclear energy Institute (NEI) Report, 94-01, Revision 3, 'Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J' (TAC No. ME2164), dated June 8, 2012" (ADAMS Accession No. ML121030286).

12. ANSI/ANS-56.8-2002, Reaffirmed August 9, 2011, "Containment System Leakage Testing Requirements".
13. Wang, A. B., U.S. Nuclear Regulatory Commission, letter to Entergy Operations, Inc., "Grand Gulf Nuclear Station, Unit 1 – Request for Additional Information Regarding License Amendment Request to Revise Technical Specifications for Containment Leak Rate Testing (TAC No. MF6310)," dated September 24, 2015 (ADAMS Accession No. ML15261A565).
14. Burford, F. G. , Entergy Operations, Inc., electronic mail to Wang, A. B., U.S. Nuclear Regulatory Commission, "peer check" Re: Evaluation of Leakage Test Results, dated August 24, 2011 (ADAMS Accession No. ML112370085).

Principal Contributor: D. A. Nold

Date: February 17, 2016

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

Sincerely,

/RA/

James S. Kim, Project Manager
Plant Licensing IV-2 and Decommissioning
Transition Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-416

Enclosures:

1. Amendment No. 209 to NPF-29
2. Safety Evaluation

cc w/encls: Distribution via Listserv

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ADAMS Accession No. ML16011A247

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