



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

July 27, 2015

Mr. Scott Batson  
Site Vice President  
Oconee Nuclear Station  
Duke Energy Carolinas, LLC  
7800 Rochester Highway  
Seneca, SC 29672-0752

**SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3, ISSUANCE OF  
AMENDMENTS ADOPTING TSTF-513 (TAC NOS. MF5403, MF5404, AND  
MF5405)**

Dear Mr. Batson:

The Nuclear Regulatory Commission (NRC) has issued the enclosed Amendment Nos. 394, 396, and 395 to Renewed Facility Operating Licenses DPR-38, DPR-47, and DPR-55, for the Oconee Nuclear Station, Units 1, 2, and 3, respectively. The amendments consist of changes to the Technical Specifications (TSs) and Facility Operating License, in response to your application dated September 18, 2014.

These amendments revise the TSs to define a new time limit for restoring inoperable Reactor Coolant System (RCS) leakage detection instrumentation to operable status and establish alternate methods of monitoring RCS leakage when one or more required monitors are inoperable in accordance with Technical Specifications Task Force Traveler (TSTF) 513, Revision 3, "Revise Pressurized-Water Reactor Operability Requirements and Actions for Reactor Coolant System Leakage Instrumentation."

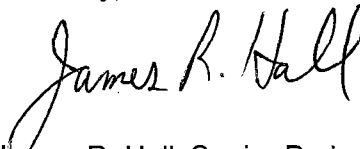
A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

S. Batson

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If you have any questions, please contact me at 301-415-4032.

Sincerely,

A handwritten signature in black ink that reads "James R. Hall". The signature is written in a cursive style with a large, stylized "J" and "H".

James R. Hall, Senior Project Manager  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosures:

1. Amendment No. 394 to DPR-38
2. Amendment No. 396 to DPR-47
3. Amendment No. 395 to DPR-55
4. Safety Evaluation

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

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. 50-269

OCONEE NUCLEAR STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 394  
Renewed License No. DPR-38

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the Oconee Nuclear Station, Unit 1 (the facility), Renewed Facility Operating License No. DPR-38, filed by Duke Energy Carolinas, LLC (the licensee), dated September 18, 2014, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

Enclosure 1

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 3.B of Renewed Facility Operating License No. DPR-38 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 394, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 120 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert J. Pascarelli, Chief  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to Renewed Facility  
Operating License No. DPR-38

Date of Issuance: July 27, 2015



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

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. 50-270

OCONEE NUCLEAR STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 396  
Renewed License No. DPR-47

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the Oconee Nuclear Station, Unit 2 (the facility), Renewed Facility Operating License No. DPR-47, filed by Duke Energy Carolinas, LLC (the licensee) dated September 18, 2014, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

Enclosure 2

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 3.B of Renewed Facility Operating License No. DPR-47 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 396, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 120 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert J. Pascarelli, Chief  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to Renewed Facility  
Operating License No. DPR-47

Date of Issuance: July 27, 2015



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

DUKE ENERGY CAROLINAS, LLC

DOCKET NO. 50-287

OCONEE NUCLEAR STATION, UNIT 3

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 395  
Renewed License No. DPR-55

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment to the Oconee Nuclear Station, Unit 3 (the facility), Renewed Facility Operating License No. DPR-55, filed by Duke Energy Carolinas, LLC (the licensee) dated September 18, 2014, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

Enclosure 3

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 3.B of Renewed Facility Operating License No. DPR-55 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 395, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 120 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Robert J. Pascarelli, Chief  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to Renewed Facility  
Operating License No. DPR-55

Date of Issuance: July 27, 2015



ATTACHMENT TO  
LICENSE AMENDMENT NO. 394  
RENEWED FACILITY OPERATING LICENSE NO. DPR-38  
DOCKET NO. 50-269  
LICENSE AMENDMENT NO. 396  
RENEWED FACILITY OPERATING LICENSE NO. DPR-47  
DOCKET NO. 50-270  
AND  
LICENSE AMENDMENT NO. 395  
RENEWED FACILITY OPERATING LICENSE NO. DPR-55  
DOCKET NO. 50-287

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

Remove Pages

Licenses

License No. DPR-38, page 3  
License No. DPR-47, page 3  
License No. DPR-55, page 3

TSs

3.4.15-1  
3.4.15-2  
3.4.15-3

Insert Pages

Licenses

License No. DPR-38, page 3  
License No. DPR-47, page 3  
License No. DPR-55, page 3

TSs

3.4.15-1  
3.4.15-2  
3.4.15-3

A. Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2568 megawatts thermal.

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 394 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

C. This license is subject to the following antitrust conditions:

Applicant makes the commitments contained herein, recognizing that bulk power supply arrangements between neighboring entities normally tend to serve the public interest. In addition, where there are net benefits to all participants, such arrangements also serve the best interests of each of the participants. Among the benefits of such transactions are increased electric system reliability, a reduction in the cost of electric power, and minimization of the environmental effects of the production and sale of electricity.

Any particular bulk power supply transaction may afford greater benefits to one participant than to another. The benefits realized by a small system may be proportionately greater than those realized by a larger system. The relative benefits to be derived by the parties from a proposed transaction, however, should not be controlling upon a decision with respect to the desirability of participating in the transaction. Accordingly, applicant will enter into proposed bulk power transactions of the types hereinafter described which, on balance, provide net benefits to applicant. There are net benefits in a transaction if applicant recovers the cost of the transaction (as defined in ¶1 (d) hereof) and there is no demonstrable net detriment to applicant arising from that transaction.

1. As used herein:

- (a) "Bulk Power" means electric power and any attendant energy, supplied or made available at transmission or sub-transmission voltage by one electric system to another.
- (b) "Neighboring Entity" means a private or public corporation, a governmental agency or authority, a municipality, a cooperative, or a lawful association of any of the foregoing owning or operating, or proposing to own or operate, facilities for the generation and transmission of electricity which meets each of

A. Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2568 megawatts thermal.

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 396 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

C. This license is subject to the following antitrust conditions:

Applicant makes the commitments contained herein, recognizing that bulk power supply arrangements between neighboring entities normally tend to serve the public interest. In addition, where there are net benefits to all participants, such arrangements also serve the best interests of each of the participants. Among the benefits of such transactions are increased electric system reliability, a reduction in the cost of electric power, and minimization of the environmental effects of the production and sale of electricity.

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A. Maximum Power Level

The licensee is authorized to operate the facility at steady state reactor core power levels not in excess of 2568 megawatts thermal.

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 395 are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

C. This license is subject to the following antitrust conditions:

Applicant makes the commitments contained herein, recognizing that bulk power supply arrangements between neighboring entities normally tend to serve the public interest. In addition, where there are net benefits to all participants, such arrangements also serve the best interests of each of the participants. Among the benefits of such transactions are increased electric system reliability, a reduction in the cost of electric power, and minimization of the environmental effects of the production and sale of electricity.

Any particular bulk power supply transaction may afford greater benefits to one participant than to another. The benefits realized by a small system may be proportionately greater than those realized by a larger system. The relative benefits to be derived by the parties from a proposed transaction, however, should not be controlling upon a decision with respect to the desirability of participating in the transaction. Accordingly, applicant will enter into proposed bulk power transactions of the types hereinafter described which, on balance, provide net benefits to applicant. There are net benefits in a transaction if applicant recovers the cost of the transaction (as defined in ¶1 (d) hereof) and there is no demonstrable net detriment to applicant arising from that transaction.

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- (a) "Bulk Power" means electric power and any attendant energy, supplied or made available at transmission or sub-transmission voltage by one electric system to another.
- (b) "Neighboring Entity" means a private or public corporation, a governmental agency or authority, a municipality, a cooperative, or a lawful association of any of the foregoing owning or operating, or proposing to own or operate, facilities for the generation and transmission of electricity which meets each of

### 3.4 REACTOR COOLANT SYSTEM (RCS)

#### 3.4.15 RCS Leakage Detection Instrumentation

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

- a. One containment normal sump level indication; and
- b. One containment atmosphere radioactivity monitor (gaseous or particulate).

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

#### ACTIONS

-----NOTE-----  
LCO 3.0.4 is not applicable.  
-----

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment sump level indication inoperable.	A.1 -----NOTE----- Not required until 12 hours after establishment of steady state operation. -----	Once per 24 hours
	Perform SR 3.4.13.1.	
	<u>AND</u> A.2 Restore containment sump level indication to OPERABLE status.	30 days

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required containment atmosphere radioactivity monitor inoperable.	B.1.1 Analyze grab samples of the containment atmosphere.	Once per 24 hours
	<u>OR</u>	
	B.1.2 -----NOTE----- Not required until 12 hours after establishment of steady state operation. -----	
	Perform SR 3.4.13.1. <u>AND</u>	Once per 24 hours
	B.2 Restore required containment atmosphere radioactivity monitor to OPERABLE status.	30 days
C. -----NOTE----- Only applicable when the containment atmosphere gaseous radiation monitor is the only OPERABLE monitor. -----  Containment sump level indication inoperable.	C.1 Analyze grab samples of the containment atmosphere.	Once per 12 hours
	<u>AND</u> C.2 Restore containment sump level indication to OPERABLE status.	7 days
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3.	12 hours
	<u>AND</u> D.2 Be in MODE 5.	36 hours

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Both required instrument functions inoperable.	E.1 Enter LCO 3.0.3.	Immediately

#### SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.2	Perform CHANNEL FUNCTIONAL TEST of required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.3	Perform CHANNEL CALIBRATION of required containment sump level indication.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.4	Perform CHANNEL CALIBRATION of required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO

THE LICENSE AMENDMENT REQUEST TO ADOPT TSTF-513

AMENDMENT NO. 394 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-38

AMENDMENT NO. 396 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-47

AND

AMENDMENT NO. 395 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-55

DUKE ENERGY CAROLINAS, LLC

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DOCKET NOS. 50-269, 50-270, AND 50-287

1.0 INTRODUCTION

By letter dated September 18, 2014 (Reference 1), Duke Energy (the licensee) proposed changes to the Technical Specifications (TSs) for Oconee Nuclear Station, Units 1, 2 and 3 (ONS). The proposed changes revise TS 3.4.15, "[Reactor Coolant System] RCS Leakage Detection Instrumentation," and includes TS Bases changes that summarize and clarify the purpose of the TS and the specified safety function of the leakage detection monitors.

The licensee stated that the License Amendment Request (LAR) is consistent with U.S. Nuclear Regulatory Commission (NRC)-approved Revision 3 to Technical Specification Task Force (TSTF) Standard Technical Specification (STS) Change Traveler, TSTF-513, "Revise Pressurized-Water Reactor (PWR) Operability Requirements and Actions for RCS Leakage Instrumentation." The availability of this TS improvement was announced in the *Federal Register* on January 3, 2011 (76 FR 189) as part of the consolidated line item improvement process (CLIIP). The licensee also proposed minor variations from the TS changes described in TSTF-513.

2.0 REGULATORY EVALUATION

The NRC's regulatory requirements related to the content of the TS are contained in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36. Paragraph (c)(2)(i) of 10 CFR 50.36 states that Limiting Conditions for Operation (LCOs) are the lowest functional capability or performance levels of equipment required for safe operation of the facility. Paragraph (c)(2)(ii) of 10 CFR 50.36

Enclosure 4



lists four criteria for determining whether particular items are required to be included in the TS LCOs. The first criterion applies to installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the Reactor Coolant Pressure Boundary (RCPB). As described in the *Federal Register* Notice associated with this regulation (60 FR 36953, July 16, 1995), the scope of TS includes two general classes of technical matters: (1) those related to prevention of accidents, and (2) those related to mitigation of the consequences of accidents. Criterion 1 addresses systems and process variables that alert the operator to a situation when accident initiation is more likely, and supports the first of these two general classes of technical matters which are included in the TS. As specified in Paragraph (c)(2)(i) of 10 CFR 50.36, when a LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TS until the condition can be met.

The NRC's guidance for the format and content of PWR TS can be found in NUREG-1430, Revision 4.0, "Standard Technical Specifications Babcock and Wilcox Plants" (Reference 2). STS 3.4.15 "RCS Leakage Detection Instrumentation" contains the guidance specific to the RCS leakage detection instrumentation for PWRs. The STS Bases provide a summary statement of the reasons for the STS.

The Bases for STS 3.4.15 contained in NUREG-1430, provide background information, the applicable safety analyses, a description of the LCO, the applicability for the RCS leakage detection instrumentation TS, and describe the Actions and Surveillance Requirements. The TS Bases provide the purpose or reason for the TS which are derived from the analyses and evaluation included in the safety analysis report, and for these Specifications, the RCS leakage detection instrumentation design assumptions and licensing basis for the plant.

As stated in NRC Information Notice (IN) 2005-24, "Nonconservatism in Leakage Detection Sensitivity" (Reference 3), the reactor coolant activity assumptions for containment atmosphere gaseous radioactivity monitors may be nonconservative. This means the monitors may not be able to detect a one gpm leak within one hour under all likely operating conditions.

The issue described in IN 2005-24 has raised questions regarding the operability requirements for containment atmosphere gaseous radioactivity monitors. TSTF-513, Revision 3, revises the TS Bases to reflect the proposed TS changes and more accurately describe the contents of the facility design basis related to operability of the RCS leakage detection instrumentation. Part of the TS Bases changes revise the specified safety function of the RCS leakage detection monitors to specify the required instrument sensitivity level. In addition, TSTF-513, Revision 3, includes revisions to TS Actions for RCS leakage detection instrumentation to establish limits for operation during conditions of reduced monitoring sensitivity because of inoperable RCS leakage detection instrumentation.

The regulation at 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 30, "Quality of Reactor Coolant Pressure Boundary," requires means for detecting and, to the extent practical, identifying the location of the source of RCS leakage. Regulatory Guide (RG) 1.45, Revision 0, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973, describes acceptable methods of implementing the GDC 30 requirements with regard to the selection of leakage detection systems for the RCPB.

RG 1.45, Revision 0, Regulatory Position C.2, states that,

"Leakage to the primary reactor containment from unidentified sources should be collected and the flow rate monitored with an accuracy of one gallon per minute (gpm) or better."

RG 1.45, Revision 0, Regulatory Position C.3 states,

At least three separate detection methods should be employed and two of these methods should be (1) sump level and flow monitoring and (2) airborne particulate radioactivity monitoring. The third method may be selected from the following: a. monitoring of condensate flow rate from air coolers [or] b. monitoring of airborne gaseous radioactivity. Humidity, temperature, or pressure monitoring of the containment atmosphere should be considered as alarms or indirect indication of leakage to the containment.

RG 1.45, Revision 0, Regulatory Position C.5 states,

"The sensitivity and response time of each leakage detection system in regulatory position 3. above employed for unidentified leakage should be adequate to detect a leakage rate, or its equivalent, of one gpm in less than one hour."

RG 1.45, Revision 0, states,

"In analyzing the sensitivity of leak detection systems using airborne particulate or gaseous radioactivity, a realistic primary coolant radioactivity concentration assumption should be used. The expected values used in the plant environmental report would be acceptable."

The appropriate sensitivity of a plant's containment atmosphere gaseous radioactivity monitors is dependent on the design assumptions and the plant-specific licensing basis as described in the plant's Final Safety Analysis Report (FSAR). The NRC staff's approval of the use of expected primary coolant radioactivity concentration values used in the environmental report creates a potential licensing conflict when a licensee is able to achieve and maintain primary coolant radioactivity concentration values lower than the value assumed in the environmental report.

RG 1.45, Revision 1, "Guidance on Monitoring and Responding to Reactor Coolant System Leakage," was issued in May 2008. RG 1.45, Revision 1, describes methods for implementing GDC 30 requirements that are different from those in RG 1.45, Revision 0, and was developed and issued to support new reactor licensing. Revision 1 allows that having two TS leakage detection methods capable of detecting a one gpm leak within one hour provides adequate leakage detection capability from a safety perspective. It recommends that other potential indicators (including the gaseous radiation monitors) be maintained even though they may not have the same detection capability. These indicators, in effect, provide additional defense-in-depth.

The regulation in GDC 4 of Appendix A to 10 CFR Part 50, "Environmental and dynamic effects design bases," requires structures, systems, and components important to safety to be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. GDC 4 allows the use of Leak Before Break (LBB) technology to exclude dynamic effects of pipe ruptures in the design bases when analyses reviewed and approved by the Commission demonstrate that the probability of fluid system piping rupture is extremely low under conditions consistent with the design basis for the piping.

The principal design criteria for ONS were developed in consideration of the 70 proposed General Design Criteria for Nuclear Power Plant Construction Permits issued by the Atomic Energy Commission (AEC) in a proposed rule-making published for 10 CFR 50 in the *Federal Register* on July 11, 1967. The ONS, Units 1, 2, and 3, construction permits were issued on November 6, 1967, preceding the issuance of the GDC specified in 10 CFR 50 Appendix A. ONS UFSAR Section 3.1.16 specifies that the RCS leakage detection instrumentation for ONS was designed to meet proposed GDC 16, "Monitoring Reactor Coolant Pressure Boundary," which simply states "Means shall be provided for monitoring the RCPB to detect leakage." Therefore, 10 CFR 50 Appendix A GDC 30, "Quality of RCPB," is not part of the ONS licensing basis. However, ONS does meet the intent of the portion of GDC 30 which specifies a means shall be provided for detecting reactor coolant leakage. Similarly, ONS was designed, and the construction permits issued, before the issuance of RG 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems" (Reference 4) and GDC 4. As such, conformance with RG 1.45 and GDC 4 was not part of the original licensing basis at ONS. However, the ONS licensing basis does support LBB as discussed in Section 3.0 of this Safety Evaluation.

### 3.0 TECHNICAL EVALUATION

In adopting the changes to TS included in TSTF-513, Revision 3, the licensee proposed to revise TS 3.4.15, "RCS Leakage Detection Instrumentation" Conditions and Required Actions. The licensee proposed adding new Condition C to TS 3.4.15. New Condition C would be applicable when the containment atmosphere gaseous radioactivity monitor is the only operable RCS leakage detection monitor. This new Condition is necessary because improved fuel integrity and the resulting lower primary coolant radioactivity concentration affects a plant's containment atmosphere gaseous radioactivity monitor to a greater extent than other monitors. The proposed Required Actions for new Condition C require the licensee to analyze grab samples of the containment atmosphere once per 12 hours and restore the required containment sump monitor to operable status within 7 days. These actions are in addition to the Required Actions of Condition A which requires performing an RCS mass balance once per 24 hours. By letter dated December 19, 2007 (Reference 5), the NRC staff issued an amendment to the licensee approving the removal of the gaseous radioactivity monitor from the TS.

The NRC staff determined that the proposed Condition C is more restrictive than the current requirement, because the current Condition that would apply to the situation when the containment atmosphere gaseous radioactivity monitor is the only operable RCS leakage detection monitor would allow the licensee 30 days to restore the inoperable monitors to operable status. The proposed Actions and Completion Times are adequate because the grab samples combined with the more frequent RCS mass balances will provide an alternate method of monitoring RCS leakage when the containment atmosphere gaseous radioactivity monitor is the

only operable RCS leakage detection monitor and the 12-hour interval is sufficient to detect increasing RCS leakage long before a piping flaw could progress to a catastrophic failure of the primary RCPB. Allowing 7 days to restore another RCS leakage monitor to operable status is reasonable given the diverse methods employed in the Required Actions to detect an RCS leak and the low probability of a large RCS leak during this period. Proposed Condition C is conservative relative to the STS, sufficiently alerts the operating staff, provides a comparable ability to detect RCS leakage, and provides time intervals that are reasonable. Therefore, the NRC staff determined that proposed Condition C provides an adequate assurance of safety when judged against current regulatory standards.

Certain ASME Code Class 1 piping systems in ONS have been approved by the NRC for LBB (Reference 6 for Unit 1, Reference 7 for Unit 2 and Reference 8 for Unit 3). The basic concept of LBB is that certain piping material has sufficient fracture toughness (i.e., ductility) to resist rapid flaw propagation; thereby minimizing the probability of a pipe rupture. The licensee has evaluated postulated flaws in RCS piping and determined the piping has sufficient fracture toughness that the postulated flaw would not lead to pipe rupture and potential damage to adjacent safety-related systems, structures and components before the plant could be placed in a safe, shutdown condition. The NRC staff has previously reviewed and approved these plant-specific LBB analyses. Before remotely approaching a pipe rupture, the postulated flaw would lead to limited but detectable leakage, which would be identified by the leak detection systems in time for the operator to take action. The NRC staff previously addressed concerns that LBB depends on erroneous leak rate measurements in the final rule making for use of LBB technology. In addressing the concerns, it was noted that:

One criterion for application of leak-before-break is that postulated flaw sizes be large enough so that the leakage is about ten times the leak detection capability, and that this flaw be stable even if earthquake loads are applied to the pipe in addition to the normal operating loads. This margin of a factor of ten is more than ample to account for uncertainties in both leakage rate calculations and leak detection capabilities. Furthermore, additional sensitivity studies reported by Lawrence Livermore National Laboratory in NUREG/CR-2189, dated September 1981, entitled "Probability of Pipe Fracture in the Primary Coolant Loop of a PWR Plant" indicate that even in the absence of leak detection, the probability of pipe ruptures in PWR primary coolant loop piping is sufficiently low to warrant exclusion of these events from the design basis. (51 FR 12502-01)

The proposed actions for inoperable RCS leakage detection instrumentation maintain sufficient continuity, redundancy, and diversity of leakage detection capability that an extremely low probability of undetected leakage leading to pipe rupture is maintained. This extremely low probability of pipe rupture continues to satisfy the basis for acceptability of LBB in GDC 4.

This licensee proposed changes to allow adoption of TSTF-513 which adds requirements for the gaseous radioactivity monitor to the ONS TS, bringing the ONS TS into closer alignment to the STS for B&W plants. The licensee proposed revising LCO 3.4.15.b from "one containment atmosphere particulate radioactivity monitor" to "One containment atmosphere radioactivity monitor (gaseous or particulate)."

The licensee proposed removing the word "required" from the Condition A description as well as from Required Action A.2. This change is identical to one of the TSTF-513 changes and removes inappropriate references to the leakage detection equipment because the word "required" is for situations in which there are multiple ways to meet the LCO. The license proposed adoption of TSTF-513 by addition of new Condition C, which applies when the containment atmosphere gaseous radiation monitor is the only operable leakage detection instrument was proposed.

Minor changes to the TS to ensure continuity of the TS format were also proposed. Current Condition C, which applies when the required action and the associated completion time are not satisfied, is changed to Condition D. Similarly, current Condition D which applies when both required instrument functions are inoperable is changed to Condition E. Similar changes were made to the associated Required Actions. The NRC staff determined that these changes are editorial, and therefore acceptable.

The associated TS Bases submitted with the licensee's proposed revision for TS 3.4.15 reflect the proposed TS changes and more accurately describe the contents of the facility design basis related to operability of the RCS leakage detection instrumentation and reflect the proposed TS changes. The proposed TS Bases changes related to the operability of the RCS leakage detection instrumentation are acceptable because they provide background information, the applicable safety analyses, a description of the LCO, and the applicability for the RCS leakage detection instrumentation TS and are consistent with the design basis of the facility. These instruments satisfy Criterion 1 of 10 CFR 50.36(c)(2)(ii) in that they are installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the RCPB.

The NRC staff evaluated the licensee's proposed changes against the applicable regulatory requirements listed in Section 2 of this SE. The NRC staff also compared the proposed changes to the changes made to STS by TSTF-513, Revision 3. The NRC staff determined that all the proposed changes afford adequate assurance of safety when judged against current regulatory standards. Therefore, the NRC staff finds the proposed changes acceptable.

#### 4.0 STATE CONSULTATION

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

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (80 FR 30100, May 26, 2015). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

## 6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

## 7.0 REFERENCES

1. Oconee Nuclear Station, Units 1, 2, and 3, "License Amendment Request for Adoption of Technical Specification Task Force (TSTF)-513, Revision 3, "Revise PWR Operability Requirements and Actions for RCS Leakage Instrumentation," September 18, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14269A078).
2. NUREG-1430, "Standard Technical Specifications, Babcock and Wilcox Plants," Revision 4.0, (ADAMS Accession No. ML12100A177).
3. NRC Information Notice (IN) 2005-24, "Nonconservatism in Leakage Detection Sensitivity" August 3, 2005 (ADAMS Accession No. ML051780073).
4. AEC Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems" Revision 0, May 1973 (ADAMS Accession No. ML003740113).
5. NRC to Bruce Hamilton, "Oconee Nuclear Station, Units 1, 2, and 3, Issuance of Amendments Regarding Removal of the Gaseous Radioactive Monitor from the Technical Specifications (TAC Nos. MD4041, MD4042, and MF4043)", December 19, 2007, (ADAMS Accession No. ML073241015).
6. NRC to Ronald Jones, "Oconee Nuclear Station, Units 1, 2, and 3, Issuance of Amendments (TAC NOS. MB8083, MB8084, AND MB8085)", September 29, 2003, (ADAMS Accession No. ML032721590).
7. NRC to Ronald Jones, "Oconee Nuclear Station, Unit 2, Issuance of Amendments (TAC No. MC1174)", February 5, 2004, (ADAMS Accession No. ML040370540).
8. NRC to Ronald Jones, "Oconee Nuclear Station, Units 1, 2, and 3, Issuance of Amendments (TAC NOS. MC3334, MC3335, AND MC3336)", September 2, 2004, (ADAMS Accession No. ML042370088).

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Date: July 27, 2015

S. Batson

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If you have any questions, please contact me at 301-415-4032.

Sincerely,

/RA/

James R. Hall, Senior Project Manager  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosures:

1. Amendment No. 394 to DPR-38
2. Amendment No. 396 to DPR-47
3. Amendment No. 395 to DPR-55
4. Safety Evaluation

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