



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

April 12, 2018

Mr. J. Ed Burchfield, Jr.  
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 REGARDING THE TECHNICAL SPECIFICATIONS FOR CONTROL ROOM HABITABILITY (CAC NOS. MF9555, MF9556, AND MF9557; EPID L-2017-LLA-0219)**

Dear Mr. Burchfield:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment Nos. 408, 410, and 409 to Renewed Facility Operating Licenses (RFOL) Nos. DPR-38, DPR-47, and DPR-55, for the Oconee Nuclear Station, Units 1, 2, and 3, respectively. The amendments revise the RFOLs and Technical Specifications in response to the application from Duke Energy Carolinas, LLC dated March 30, 2017 (ON-2017-028), as supplemented by letters ON-2017-039, ONS-2017-067, and ONS-2018-029 dated May 11, and October 16, 2017, and April 4, 2018, respectively.

The amendments revise the Technical Specifications (TSs) in accordance with the NRC approved TS Task Force (TSTF) Standard Technical Specification change traveler TSTF-448, Revision 3, "Control Room Habitability," with variations from TSTF-448 because of the plant's design and licensing basis. The amendments modify TS 3.7.9, "Control Room Ventilation System (CRVS) Booster Fans," establish a control room envelope habitability program in TS 5.5, "Programs and Manuals," and add a new license condition.

J. E. Burchfield, Jr.

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The staff's safety evaluation of the amendments is enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,



Audrey L. Klett, 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. 408 to DPR-38
2. Amendment No. 410 to DPR-47
3. Amendment No. 409 to DPR-55
4. Safety Evaluation

cc: Listserv



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. 408  
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 March 30, 2017, and supplemented by letters dated May 11, and October 16, 2017, and April 4, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by changes to the Operating License and 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 and Paragraph 3.J of Renewed Facility Operating License No. DPR-38 is hereby added to read as follows:

B. Technical Specifications

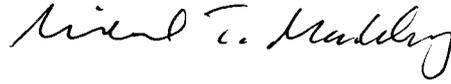
The Technical Specifications contained in Appendix A, as revised through Amendment No. 408, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

- J. Upon implementation of Amendment No. 408 adopting TSTF-448, Revision 3, the determination of CRE unfiltered air in-leakage as required by TS SR 3.7.9.4, in accordance with TS 5.5.23.c.(i); the assessment of CRE habitability as required by TS 5.5.23.c.(ii); and the measurement of pressure as required by TS 5.5.23.d, shall be considered met. Following implementation:

- (a) The first performance of SR 3.7.9.4 in accordance with Specification 5.5.23.c.(i), shall be within the specified Frequency of 6 years, plus the 18 month (25%) allowance of SR 3.0.2, as measured from the date of the most recent successful tracer gas test, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.
- (b) The first performance of the periodic assessment of CRE habitability, TS 5.5.23.c.(ii), shall be within 3 years, plus the 9 month (25%) allowance of SR 3.0.2, as measured from the date of the most recent successful tracer gas test or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.
- (c) The first performance of the periodic measurement of CRE pressure, TS 5.5.23.d shall be within 24 months plus the 6 months allowed by SR 3.0.2, as measured from the most recent successful pressure measurement test, or within 6 months if not performed previously.

3. This license amendment is effective as of its date of issuance and shall be implemented within 180 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Michael T. Markley, Chief  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to Renewed Facility  
Operating License No. DPR-38  
and the Technical Specifications

Date of Issuance: April 12, 2018



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. 410  
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 March 30, 2017, and supplemented by letters dated May 11, and October 16, 2017, and April 4, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by changes to the Operating License and 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 and Paragraph 3.J of Renewed Facility Operating License No. DPR-47 is hereby added to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 410, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

- J. Upon implementation of Amendment No. 410 adopting TSTF-448, Revision 3, the determination of CRE unfiltered air in-leakage as required by TS SR 3.7.9.4, in accordance with TS 5.5.23.c.(i); the assessment of CRE habitability as required by TS 5.5.23.c.(ii); and the measurement of pressure as required by TS 5.5.23.d, shall be considered met. Following implementation:

- (a) The first performance of SR 3.7.9.4 in accordance with Specification 5.5.23.c.(i), shall be within the specified Frequency of 6 years, plus the 18 month (25%) allowance of SR 3.0.2, as measured from the date of the most recent successful tracer gas test, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.
- (b) The first performance of the periodic assessment of CRE habitability, TS 5.5.23.c.(ii), shall be within 3 years, plus the 9 month (25%) allowance of SR 3.0.2, as measured from the date of the most recent successful tracer gas test or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.
- (c) The first performance of the periodic measurement of CRE pressure, TS 5.5.23.d shall be within 24 months plus the 6 months allowed by SR 3.0.2, as measured from the most recent successful pressure measurement test, or within 6 months if not performed previously.

3. This license amendment is effective as of its date of issuance and shall be implemented within 180 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Michael T. Markley, Chief  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to Renewed Facility  
Operating License No. DPR-47  
and the Technical Specifications

Date of Issuance: April 12, 2018



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. 409  
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 March 30, 2017, and supplemented by letters dated May 11, and October 16, 2017, and April 4, 2018, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by changes to the Operating License and 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 and Paragraph 3.J of Renewed Facility Operating License No. DPR-55 is hereby added to read as follows:

B. Technical Specifications

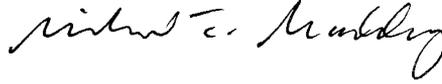
The Technical Specifications contained in Appendix A, as revised through Amendment No. 409, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

- J. Upon implementation of Amendment No. 409 adopting TSTF-448, Revision 3, the determination of CRE unfiltered air in-leakage as required by TS SR 3.7.9.4, in accordance with TS 5.5.23.c.(i); the assessment of CRE habitability as required by TS 5.5.23.c.(ii); and the measurement of pressure as required by TS 5.5.23.d, shall be considered met. Following implementation:

- (a) The first performance of SR 3.7.9.4 in accordance with Specification 5.5.23.c.(i), shall be within the specified Frequency of 6 years, plus the 18 month (25%) allowance of SR 3.0.2, as measured from the date of the most recent successful tracer gas test, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.
- (b) The first performance of the periodic assessment of CRE habitability, TS 5.5.23.c.(ii), shall be within 3 years, plus the 9 month (25%) allowance of SR 3.0.2, as measured from the date of the most recent successful tracer gas test or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.
- (c) The first performance of the periodic measurement of CRE pressure, TS 5.5.23.d shall be within 24 months plus the 6 months allowed by SR 3.0.2, as measured from the most recent successful pressure measurement test, or within 6 months if not performed previously.

3. This license amendment is effective as of its date of issuance and shall be implemented within 180 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Michael T. Markley, Chief  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to Renewed Facility  
Operating License No. DPR-55  
and the Technical Specifications

Date of Issuance: April 12, 2018

ATTACHMENT TO

AMENDMENT NO. 408 RENEWED FACILITY OPERATING LICENSE NO. DPR-38

AMENDMENT NO. 410 RENEWED FACILITY OPERATING LICENSE NO. DPR-47

AMENDMENT NO. 409 RENEWED FACILITY OPERATING LICENSE NO. DPR-55

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

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

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

*Operating Licenses*

Remove Pages

License No. DPR-38, page 3  
License No. DPR-38, page 11  
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License No. DPR-47, page 3  
License No. DPR-47, page 11  
-----

License No. DPR-55, page 3  
License No. DPR-55, page 11  
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Insert Pages

License No. DPR-38, page 3  
License No. DPR-38, page 11  
License No. DPR-38, page 12

License No. DPR-47, page 3  
License No. DPR-47, page 11  
License No. DPR-47, page 12

License No. DPR-55, page 3  
License No. DPR-55, page 11  
License No. DPR-55, page 12

*Technical Specifications*

Remove Pages

v  
3.7.9-1  
3.7.9-2  
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5.0.23  
5.0.24  
5.0.25  
5.0.26  
5.0.27  
5.0.28  
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Insert Pages

v  
3.7.9-1  
3.7.9-2  
3.7.9-3  
3.7.9-4  
5.0.23  
5.0.24  
5.0.25  
5.0.26  
5.0.27  
5.0.28  
5.0.29

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. 408 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

- (b) Operations to mitigate fuel damage considering the following:
  - 1. Protection and use of personnel assets
  - 2. Communications
  - 3. Minimizing fire spread
  - 4. Procedures for implementing integrated fire response strategy
  - 5. Identification of readily-available pre-staged equipment
  - 6. Training on integrated fire response strategy
  - 7. SFP mitigation measures
  
- (c) Actions to minimize release to include consideration of:
  - 1. Water spray scrubbing
  - 2. Dose to onsite responders

I. Protected Service Water System Seismic Assessment License Condition

Duke Energy Carolinas, LLC (Duke Energy) shall perform a seismic probabilistic risk assessment (SPRA) which includes the Protected Service Water (PSW) system, in accordance with the Electric Power Research Institute (EPRI) Report No. 1025287, "Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," (i.e., the SPID report, November 2012) for the Oconee Nuclear Station (ONS). Duke Energy shall expand the Seismic Equipment List (SEL) to include the PSW system.

J. Upon implementation of Amendment No. 408 adopting TSTF-448, Revision 3, the determination of CRE unfiltered air in-leakage as required by TS SR 3.7.9.4, in accordance with TS 5.5.23.c.(i); the assessment of CRE habitability as required by TS 5.5.23.c.(ii); and the measurement of pressure as required by TS 5.5.23.d, shall be considered met. Following implementation:

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- (b) The first performance of the periodic assessment of CRE habitability, TS 5.5.23.c.(ii), shall be within 3 years, plus the 9 month (25%) allowance of SR 3.0.2, as measured from the date of the most recent successful tracer gas test or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.
  
- (c) The first performance of the periodic measurement of CRE pressure, TS 5.5.23.d shall be within 24 months plus the 6 months allowed by SR 3.0.2, as measured from the most recent successful pressure measurement test, or within 6 months if not performed previously.

4. This renewed license is effective as of the date of issuance and shall expire at midnight on February 6, 2033.

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by Roy P. Zimmerman

Roy Zimmerman, Acting Director  
Office of Nuclear Reactor Regulation

Attachment:

- 1) Appendix A- Technical Specifications Renewed License No. DPR-38

Date of Issuance: May 23, 2000

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. 410 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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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

- (b) Operations to mitigate fuel damage considering the following:
  - 1. Protection and use of personnel assets
  - 2. Communications
  - 3. Minimizing fire spread
  - 4. Procedures for implementing integrated fire response strategy
  - 5. Identification of readily-available pre-staged equipment
  - 6. Training on integrated fire response strategy
  - 7. SFP mitigation measures
  
- (c) Actions to minimize release to include consideration of:
  - 1. Water spray scrubbing
  - 2. Dose to onsite responders

I. Protected Service Water System Seismic Assessment License Condition

Duke Energy Carolinas, LLC (Duke Energy) shall perform a seismic probabilistic risk assessment (SPRA) which includes the Protected Service Water (PSW) system, in accordance with the Electric Power Research Institute (EPRI) Report No. 1025287, "Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," (i.e., the SPID report, November 2012) for the Oconee Nuclear Station (ONS). Duke Energy shall expand the Seismic Equipment List (SEL) to include the PSW system.

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4. This renewed license is effective as of the date of issuance and shall expire at midnight on October 6, 2033.

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by Roy P. Zimmerman

Roy Zimmerman, Acting Director  
Office of Nuclear Reactor Regulation

Attachment:

- 1) Appendix A- Technical Specifications Renewed License No. DPR-47

Date of Issuance: May 23, 2000

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. 409 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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- (b) Operations to mitigate fuel damage considering the following:
  - 1. Protection and use of personnel assets
  - 2. Communications
  - 3. Minimizing fire spread
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  - 5. Identification of readily-available pre-staged equipment
  - 6. Training on integrated fire response strategy
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I. Protected Service Water System Seismic Assessment License Condition

Duke Energy Carolinas, LLC (Duke Energy) shall perform a seismic probabilistic risk assessment (SPRA) which includes the Protected Service Water (PSW) system, in accordance with the Electric Power Research Institute (EPRI) Report No. 1025287, "Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," (i.e., the SPID report, November 2012) for the Oconee Nuclear Station (ONS). Duke Energy shall expand the Seismic Equipment List (SEL) to include the PSW system.

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- (c) The first performance of the periodic measurement of CRE pressure, TS 5.5.23.d shall be within 24 months plus the 6 months allowed by SR 3.0.2, as measured from the most recent successful pressure measurement test, or within 6 months if not performed previously.

4. This renewed license is effective as of the date of issuance and shall expire at midnight on July 19, 2034.

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by Roy P. Zimmerman

Roy Zimmerman, Acting Director  
Office of Nuclear Reactor Regulation

Attachment:

- 1) Appendix A- Technical Specifications Renewed License No. DPR-55

Date of Issuance: May 23, 2000

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5.6	Reporting Requirements .....	5.0-25

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3.7 PLANT SYSTEMS

3.7.9 Control Room Ventilation System (CRVS) Booster Fans

LCO 3.7.9 Two CRVS Booster Fan trains shall be OPERABLE.

-----NOTE-----  
The control room envelope (CRE) boundary may be opened intermittently under administrative control if it is confirmed by analysis that the CRE boundary can be restored and the CRE pressurized in time to ensure accident analysis assumptions remain valid.  
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APPLICABILITY: MODES 1, 2, 3, 4, 5, and 6,  
During movement of recently irradiated fuel assemblies for any unit.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CRVS Booster Fan train inoperable for reasons other than Condition B.	A.1 Restore CRVS Booster Fan train to OPERABLE status.	7 days
B. One or more CRVS Booster Fan trains inoperable due to inoperable CRE boundary in MODE 1, 2, 3, or 4.	B.1 Initiate action to implement mitigating actions.	Immediately
	<u>AND</u> B.2 Verify mitigating actions ensure CRE occupant radiological exposures will not exceed limits and CRE occupants are protected from chemical and smoke hazards.	24 hours
	<u>AND</u> B.3 Restore CRE boundary to OPERABLE status.	90 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.</p>	<p>C.1 Be in MODE 3. <u>AND</u> C.2 Be in MODE 5.</p>	<p>12 hours  36 hours</p>
<p>D. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of recently irradiated fuel assemblies.</p>	<p>D.1 Start the OPERABLE CRVS Booster Fan train. <u>OR</u> D.2 Suspend movement of recently irradiated fuel assemblies.</p>	<p>Immediately  Immediately</p>
<p>E. Two CRVS Booster Fan trains inoperable in MODE 5 or 6, or during movement of recently irradiated fuel assemblies.</p> <p><u>OR</u></p> <p>One or more CRVS Booster Fan trains inoperable due to an inoperable CRE boundary in MODE 5 or 6, or during movement of recently irradiated fuel assemblies.</p>	<p>E.1 Suspend movement of recently irradiated fuel assemblies.</p>	<p>Immediately</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Two CRVS Booster Fan trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	F.1 Restore one CRVS Booster Fan train to OPERABLE status.	24 hours
G. Required Action and associated Completion Time of Condition F not met.	G.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.9.1 Operate each CRVS Booster Fan train for $\geq 1$ hour.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.2 Perform required CRVS Booster Fan train filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.9.3 Verify the control room isolates on a manual actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.4 Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.9.5	Verify the system makeup flow rate is $\geq 1215$ and $\leq 1485$ cfm when supplying the control room with outside air.	In accordance with the Surveillance Frequency Control Program

5.5 Programs and Manuals

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5.5.22 Protected Service Water System Battery Monitoring and Maintenance Program

This program is applicable only to the Protected Service Water Battery cells and provides for battery restoration and maintenance, based on the recommendation of IEEE Standard 450-1995. "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," including the following:

1. Actions to restore battery cells with float voltage  $\leq 2.13$  V;
2. Actions to determine whether the float voltage of the remaining battery cells is  $> 2.13$  V when the float voltage of a battery cell has been found to be  $\leq 2.13$  V;
3. Actions to equalize and test battery cells that had been discovered with electrolyte level below the top of the plates;
4. Limits on average electrolyte temperature, battery connection resistance, and battery terminal voltage; and
5. A requirement to obtain specific gravity readings of all cells at each discharge test, consistent with manufacturer recommendations

5.5.23 Control Room Envelope Habitability Program

A Control Room Envelope (CRE) Habitability Program shall be established and implemented to ensure that CRE habitability is maintained such that, with an OPERABLE Control Room Ventilation System, CRE occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event, hazardous chemical release, or a smoke challenge. The program shall ensure that adequate radiation protection is provided to permit access and occupancy of the CRE under design basis accident (DBA) conditions without personnel receiving radiation exposures in excess of 5 rem total effective dose equivalent (TEDE) for the duration of the accident.

The program shall include the following elements:

- a. The definition of the CRE and the CRE boundary.
- b. Requirements for maintaining the CRE boundary in its design condition including configuration control and preventive maintenance.
- c. Requirements for (i) determining the unfiltered air inleakage past the CRE boundary into the CRE in accordance with the testing methods and at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and (ii) assessing CRE habitability at the

5.5 Programs and Manuals

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5.5.23 Control Room Envelope Habitability Program (continued)

Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

- d. Measurement, at designated locations, of the CRE pressure relative to all external areas adjacent to the CRE boundary during the pressurization mode of operation by one train of the CRVS, operating at the flow rate required by the VFTP, at a frequency of 24 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the 24-month assessment of the CRE boundary.
- e. The quantitative limits on unfiltered air inleakage into the CRE. These limits shall be stated in a manner to allow direct comparison to the unfiltered air inleakage measured by the testing described in paragraph c. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of DBA consequences. Unfiltered air inleakage limits for hazardous chemicals must ensure that exposure of CRE occupants to these hazards will be within the assumptions in the licensing basis.
- f. The provisions of SR 3.0.2 are applicable to the Frequencies for assessing CRE habitability, determining CRE unfiltered inleakage, and measuring CRE pressure and assessing the CRE boundary as required by paragraphs c and d, respectively.

5.0 ADMINISTRATIVE CONTROLS

5.6 Reporting Requirements

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The following reports shall be submitted in accordance with 10 CFR 50.4.

5.6.1 Deleted

5.6.2 Annual Radiological Environmental Operating Report

-----NOTE-----  
A single submittal may be made for a multiple unit station. The submittal should combine sections common to all units at the station.  
-----

The Annual Radiological Environmental Operating Report covering the operation of the unit during the previous calendar year shall be submitted by May 15 of each year.

The report shall include summaries, interpretations, and analyses of trends of the results of the radiological environmental monitoring program for the reporting period. The material provided shall be consistent with the objectives outlined in the Offsite Dose Calculation Manual (ODCM), and in 10 CFR 50, Appendix I, Sections IV.B.2, IV.B.3, and IV.C.

5.6 Reporting Requirements (continued)

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5.6.3 Radioactive Effluent Release Report

-----NOTE-----  
A single submittal may be made for a multiple unit station. The submittal should combine sections common to all units at the station; however, for units with separate radwaste systems, the submittal shall specify the releases of radioactive material from each unit.  
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The Radioactive Effluent Release Report covering the operation of the unit in the previous year shall be submitted prior to May 1 of each year in accordance with 10 CFR 50.36a. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be consistent with the objectives outlined in the ODCM and Process Control Program and in conformance with 10 CFR 50.36a and 10 CFR part 50, Appendix I, Section IV.B.1.

5.6.4 Deleted

5.6.5 CORE OPERATING LIMITS REPORT (COLR)

Core operating limits shall be established, determined and issued in accordance with the following:

- a. Core operating limits shall be established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and shall be documented in the COLR for the following:
  1. Shutdown Margin limit for Specification 3.1.1;
  2. Moderator Temperature Coefficient limit for Specification 3.1.3;
  3. Physical Position, Sequence and Overlap limits for Specification 3.2.1 Rod Insertion Limits;
  4. AXIAL POWER IMBALANCE operating limits for Specification 3.2.2;
  5. QUADRANT POWER TILT (QPT) limits for Specification 3.2.3;

5.6 Reporting Requirements

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5.6.5 CORE OPERATING LIMITS REPORT (COLR) (continued)

6. Nuclear Overpower Flux/Flow/Imbalance and RCS Variable Low Pressure allowable value limits for Specification 3.3.1;
  7. RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits for Specification 3.4.1
  8. Core Flood Tanks Boron concentration limits for Specification 3.5.1;
  9. Borated Water Storage Tank Boron concentration limits for Specification 3.5.4;
  10. Spent Fuel Pool Boron concentration limits for Specification 3.7.12;
  11. RCS and Transfer Canal boron concentration limits for Specification 3.9.1; and
  12. AXIAL POWER IMBALANCE protective limits and RCS Variable Low Pressure protective limits for Specification 2.1.1.
- b. The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:
- (1) DPC-NE-1002-A, Reload Design Methodology II;
  - (2) NFS-1001-A, Reload Design Methodology;
  - (3) DPC-NE-2003-P-A, Oconee Nuclear Station Core Thermal Hydraulic Methodology Using VIPRE-01;
  - (4) DPC-NE-1004-A, Nuclear Design Methodology Using CASMO-3/SIMULATE-3P;
  - (5) DPC-NE-2008-P-A, Fuel Mechanical Reload Analysis Methodology Using TACO3 and GDTACO;
  - (6) BAW-10192-P-A, BWNT LOCA - BWNT Loss of Coolant Accident Evaluation Model for Once-Through Steam Generator Plants;

5.6 Reporting Requirements

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5.6.5 CORE OPERATING LIMITS REPORT (COLR) (continued)

- (7) DPC-NE-3000-P-A, Thermal Hydraulic Transient Analysis Methodology;
- (8) DPC-NE-2005-P-A, Thermal Hydraulic Statistical Core Design Methodology;
- (9) DPC-NE-3005-P-A, UFSAR Chapter 15 Transient Analysis Methodology :
- (10) BAW-10227-P-A, Evaluation of Advanced Cladding and Structural Material (M5) in PWR Reactor Fuel;
- (11) BAW-10164P-A, RELAP 5/MOD2-B&W – An Advanced Computer Program for Light Water Reactor LOCA and non-LOCA Transient Analysis; and
- (12) DPC-NE-1006-P-A, Oconee Nuclear Design Methodology Using CASMO-4/SIMULATE-3 (Revision 0, May 2009).

The COLR will contain the complete identification for each of the Technical Specifications referenced topical reports used to prepare the COLR (i.e., report number, title, revision number, report date or NRC SER date, and any supplements).

- c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling System (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.
- d. The COLR, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

5.6.6 Post Accident Monitoring (PAM) and Main Feeder Bus Monitor Panel (MFPMP) Report

When a report is required by Condition B or G of LCO 3.3.8, "Post Accident Monitoring (PAM) Instrumentation" or Condition D of LCO 3.3.23, "Main Feeder Bus Monitor Panel," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring (PAM only), the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

## 5.6 Reporting Requirements

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### 5.6.7 Tendon Surveillance Report

Any abnormal degradation of the containment structure detected during the tests required by the Pre-stressed Concrete Containment Tendon Surveillance Program shall be reported to the NRC within 30 days. The report shall include a description of the tendon condition, the condition of the concrete (especially at tendon anchorages), the inspection procedures, the tolerances on cracking, and the corrective action taken.

### 5.6.8 Steam Generator Tube Inspection Report

A report shall be submitted within 180 days after the initial entry into MODE 4 following completion of an inspection performed in accordance with Specification 5.5.10, Steam Generator (SG) Program. The report shall include:

- a. The scope of inspections performed on each SG,
  - b. Active degradation mechanisms found,
  - c. Nondestructive examination techniques utilized for each degradation mechanism,
  - d. Location, orientation (if linear), and measured sizes (if available) of service induced indications,
  - e. Number of tubes plugged during the inspection outage for each active degradation mechanism,
  - f. Total number and percentage of tubes plugged to date,
  - g. The results of condition monitoring, including the results of tube pulls and in-situ testing, and
  - h. The effective plugging percentage for all plugging in each SG.
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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION FOR  
AMENDMENT NO. 408 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-38  
AMENDMENT NO. 410 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-47  
AMENDMENT NO. 409 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 ON-2017-028 dated March 30, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17095A530), as supplemented by letters ON-2017-039, ONS-2017-067, and ONS-2018-029 dated May 11, and October 16, 2017, and April 4, 2018 (ADAMS Accession Nos. ML17139D352, ML17292A051, and ML18096A685), respectively, Duke Energy Carolinas, LLC (the licensee) applied for license amendments to Renewed Facility Operating Licenses DPR-38, DPR-47, and DPR-55, for the Oconee Nuclear Station, Units 1, 2, and 3 (Oconee), respectively. The licensee requested to revise the Technical Specifications (TSs) in accordance with Technical Specification Task Force (TSTF) Traveler TSTF-448, Revision 3, "Control Room Habitability," (ADAMS Accession Nos. ML062210095 and ML063630467) with variations because of the plant's design and licensing basis. The licensee requested to modify TS 3.7.9, "Control Room Ventilation System (CRVS) Booster Fans," and establish a control room envelope habitability program in TS 5.5, "Programs and Manuals."

By letter dated April 24, 2017 (ADAMS Accession No. ML17110A329), the U.S. Nuclear Regulatory Commission (NRC or the Commission) staff (i.e., "the staff") requested supplemental information from the licensee in order to accept the application for review. By letter dated May 11, 2017, the licensee responded to the staff's request. From July 21, 2017, through August 21, 2017, the staff conducted an audit to support its review of the amendment request, as discussed in the audit plan dated July 25, 2017 (ADAMS Accession No. ML17202U731), and audit summary dated October 5, 2017 (ADAMS Accession No. ML17268A092). By electronic mail (e-mail) dated September 7, 2017 (ADAMS Accession No. ML17256A123), the staff requested additional information from the licensee. By letter dated October 16, 2017, the licensee responded to the request. The licensee's supplements dated October 16, 2017, and April 4, 2018, provided additional information that clarified the application, did not expand the

scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* (FR) on July 18, 2017 (82 FR 32879).

## 2.0 REGULATORY EVALUATION

### 2.1 Description of TSTF-448

In NRC Generic Letter (GL) 2003-01, "Control Room Habitability," dated June 12, 2003 (ADAMS Accession No. ML031620248), the staff informed licensees that existing TS surveillance requirements for control room envelope (CRE) emergency ventilation systems may not be adequate. Specifically, the results of the tracer gas tests to measure CRE unfiltered inleakage at facilities, which were done per American Society for Testing and Materials International (ASTM) Standard E741-00 (ASTM E741), "Standard Test Method for Determining Air Change in a Single Zone by Means of a Tracer Gas Dilution" (2000), indicated that differential pressure surveillance testing is not a reliable method for demonstrating CRE boundary operability. In GL 2003-01, the staff requested licensees to do the following:

Provide confirmation that your technical specifications verify the integrity [i.e., operability] of the CRE [boundary], and the assumed [unfiltered] inleakage rates of potentially contaminated air. If you currently have a differential pressure surveillance requirement to demonstrate CRE [boundary] integrity, provide the basis for your conclusion that it remains adequate to demonstrate CRE integrity in light of the ASTM E741 testing results. If you conclude that your differential pressure surveillance requirement is no longer adequate, provide a schedule for: 1) revising the surveillance requirement in your technical specification to reference an acceptable surveillance methodology (e.g., ASTM E741), and 2) making any necessary modifications to your CRE [boundary] so that compliance with your new surveillance requirement can be demonstrated.

If your facility does not currently have a technical specification surveillance requirement for your CRE integrity, explain how and at what frequency you confirm your CRE integrity and why this is adequate to demonstrate CRE integrity.

To promote standardization and to minimize the resources that would be needed to create and process plant-specific amendment applications in response to the concerns described in the GL, the industry proposed revisions to CRE habitability system requirements contained in the Standard Technical Specifications (STSs). By letter dated August 8, 2006 (ADAMS Accession No. ML062210095), the TSTF submitted TSTF-448, Revision 3, which proposed changes to the improved STSs. The STSs and bases for Babcock and Wilcox (B&W) plants are in NUREG-1430 (ADAMS Accession Nos. ML12100A177 and ML12100A178). TSTF-448, Revision 3, is a proposal to establish more effective and appropriate action, surveillance, and administrative requirements in the STSs related to ensuring the habitability of the CRE. The NRC staff approved TSTF-448, Revision 3, and a notice of availability of this TSTF traveler for use in license amendment requests was published in the *Federal Register* on January 17, 2007 (72 FR 2022).

Adoption of TSTF-448, Revision 3, assures that the TS limiting condition for operation (LCO) for Oconee's CRVS booster fans is met by adding a surveillance requirement (SR) that demonstrates that unfiltered leakage into the CRE is within limits, thus ensuring the operability

of the CRE boundary. In support of this SR, which specifies a test interval (i.e., a frequency) described in NRC Regulatory Guide (RG) 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, dated May 2003 (ADAMS Accession No. ML031490664), TSTF-448 also adds administrative controls to the TSs to assure the habitability of the CRE between performances of the ASTM E741 test. In addition, adoption of TSTF-448 establishes clearly stated and reasonable required actions in the event CRE unfiltered inleakage is found to exceed the analysis assumption. In its notice of availability of TSTF-448, Revision 3, the staff concluded that adoption of TSTF-448 for the control room emergency ventilation system and the CRE boundary would meet the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Sections 50.36(c)(2) and 50.36(c)(3). Adoption of TSTF-448, Revision 3, at Oconee will better assure that Oconee's CRE will remain habitable during normal operation and design basis accident (DBA) conditions.

## 2.2 Control Room, Control Room Envelope, and CRVS Booster Fans

NRC Regulatory Guide (RG) 1.196, "Control Room Habitability at Light-water Nuclear Power Reactors," Revision 0, dated May 2003 (ADAMS Accession No. ML03149611), uses the term, "control room envelope," in addition to the term, "control room," and defines each term as follows:

**Control Room:** The plant area, defined in the facility licensing basis, in which actions can be taken to operate the plant safely under normal conditions and to maintain the reactor in a safe condition during accident situations. It encompasses the instrumentation and controls necessary for a safe shutdown of the plant and typically includes the critical document reference file, computer room (if used as an integral part of the emergency response plan), shift supervisor's office, operator wash room and kitchen, and other critical areas to which frequent personnel access or continuous occupancy may be necessary in the event of an accident.

**Control Room Envelope:** The plant area, defined in the facility licensing basis, which in the event of an emergency, can be isolated from the plant areas and the environment external to the CRE. This area is served by an emergency ventilation system, with the intent of maintaining the habitability of the control room. This area encompasses the control room, and may encompass other non-critical areas to which frequent personnel access or continuous occupancy is not necessary in the event of an accident.

NRC RG 1.197 also contains these definitions but uses the term, "control room envelope," to mean both the control room and the CRE because the protected environment provided for operators varies among nuclear power facilities. At some facilities, this environment is limited to the control room; at others, it is the CRE. Consistent with the proposed changes to the STS, the staff uses CRE in this safety evaluation to designate both the control room and the CRE.

By letter dated June 1, 2004 (ADAMS Accession No. ML041540124), the NRC issued Amendment Nos. 338, 339, and 339 to Oconee Units 1, 2, and 3, respectively. The amendments revised the TSs to incorporate changes resulting from use of an alternative source term (AST). The licensee re-analyzed the postulated loss of coolant accident (LOCA) based on the AST described in NUREG-1465, "Accident Source Terms for Light-Water Nuclear Power Plants," (ADAMS Accession No. ML041040063) and, as a result, revised the Oconee Updated Final Safety Analysis Report (UFSAR), Section 15.15, "Maximum Hypothetical Accident." The licensee also re-evaluated control room habitability. The licensee assumed that CRVS booster fan trains maintain a positive control room pressure to ensure outward leakage, thus minimizing

unfiltered air leakage into the control room. The licensee assumed a bounding 40 cubic feet per minute (cfm) unfiltered air leakage into the control room. Furthermore, the licensee assumed that the control room operator will start the CRVS booster fans within 30 minutes after occurrence of a DBA and concluded that the radiological consequences to the control room operator resulting from the postulated LOCA were within the 5 Roentgen equivalent man (rem) total effective dose equivalent (TEDE) criterion specified in 10 CFR 50.67.

The CRVS is designed to maintain a habitable environment in the control room envelope for 30 days of continuous occupancy after a DBA without exceeding 5 rem TEDE. The CRVS consists of two booster fan trains capable of maintaining the habitability of the CRE. The CRVS booster fan trains provide a protected environment from which operators can control the unit during airborne challenges from radioactivity, hazardous chemicals, and fire byproducts, such as fire suppression agents and smoke, during both normal and accident conditions. The CRVS is considered operable when the individual components necessary to limit operator exposure are operable in both trains. A CRVS booster fan train is considered operable when the associated booster fan is operable; high efficiency particulate air (HEPA) filters and charcoal adsorber are not excessively restricting flow and are capable of performing their filtration functions; ductwork, valves, and flowpath dampers are operable; control room unfiltered leakage can be maintained within limits; and the CRE boundary is maintained such that the CRE occupant dose from a large radioactive release does not exceed the calculated dose in the licensing basis consequences analyses for DBAs and CRE occupants are protected from hazardous chemicals and smoke.

### 2.3 Licensee's Proposed Adoption of TSTF-448, Revision 3

Consistent with the B&W-related changes in TSTF-448, Revision 3, the licensee proposed revising the actions and SRs in TS 3.7.9 and adding a new administrative controls program, "Control Room Envelope Habitability Program," as TS 5.5.23. The licensee proposed a new license condition regarding the initial performance of the new SRs and administrative controls program. The licensee also proposed plant-specific variations from TSTF-448, Revision 3, and the model application and safety evaluation published in the FR on January 17, 2002, as a result of differences between the Oconee licensing and design basis and that assumed in the STSs. The licensee proposed adding a note to the TS 3.7.9 LCO and modifying the applicability statement of that TS. The licensee proposed the changes to ensure that CRE boundary operability is maintained and verified through effective surveillance and programmatic requirements and that appropriate remedial actions are taken in the event of an inoperable CRE boundary. Section 3 of this safety evaluation describes the changes in more detail. The licensee also proposed conforming changes to the TS Table of Contents and provided conforming changes to the TS Bases.

### 2.4 Regulatory Review

The staff considered the following regulatory requirements and licensing and design basis information during its review of the proposed changes.

### *Regulatory Requirements*

The staff based its acceptance of the application using the reference values for the accident source term provided in 10 CFR 50.67(b)(2), which states:

The NRC may issue the amendment only if the applicant's analysis demonstrates with reasonable assurance that:

- (i) An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 0.25 Sv (25 rem)<sup>2</sup> [TEDE].
- (ii) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage), would not receive a radiation dose in excess of 0.25 Sv (25 rem) [TEDE].
- (iii) Adequate radiation protection is provided to permit access to and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 0.05 Sv (5 rem) [TEDE] for the duration of the accident.

[...]

<sup>2</sup> The use of 0.25 Sv (25 rem) TEDE is not intended to imply that this value constitutes an acceptable limit for emergency doses to the public under accident conditions. Rather, this 0.25 Sv (25 rem) TEDE value has been stated in this section as a reference value, which can be used in the evaluation of proposed design basis changes with respect to potential reactor accidents of exceedingly low probability of occurrence and low risk of public exposure to radiation.

Section 50.36(c) of Title 10 of the *Code of Federal Regulations* (10 CFR) requires that the TSs include items in the following categories: (1) safety limits, limiting safety system settings, and limiting control settings; (2) LCOs; (3) surveillance requirements; (4) design features; and (5) administrative controls. Section 50.36(c)(2) states that LCOs are the lowest functional capability or performance levels of equipment required for safe operation of the facility and that when an LCO is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met. Section 50.36(c)(3) states that SRs are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met. Section 50.36(c)(5) states that administrative controls are the provisions relating to organization and management, procedures, recordkeeping, review and audit, and reporting necessary to assure operation of the facility in a safe manner.

### *Guidance*

NUREG-0800, "Standard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 15.0.1, "Radiological Consequence Analyses Using Alternative Source Terms," Revision 0, dated July 2000 (ADAMS Accession No. ML003734190), provides guidance to the NRC staff for the review of AST amendment requests. SRP 15.0.1 states that the NRC reviewer should evaluate the proposed change against the guidance in RG 1.183, "Alternative Radiological Source Terms for Evaluating Design

Basis Accidents at Nuclear Power Reactors,” dated July 2000 (ADAMS Accession No. ML003716792).

RG 1.183 provides the methodology for analyzing the radiological consequences of several DBAs to show compliance with 10 CFR 50.67. RG 1.183 provides guidance to licensees on acceptable application of AST (also known as the accident source term) submittals, including acceptable radiological analysis assumptions for use in conjunction with the accepted AST.

The staff based its acceptance of the application, in part, on the accident specific guideline values in Regulatory Position 4.4 of RG 1.183 and Table 1 of SRP Section 15.0.1.

RG 1.78, “Evaluating the Habitability of a Nuclear Power Plant Control Room during a Postulated Hazardous Chemical Release,” Revision 1, dated December 2001 (ADAMS Accession No. ML013100014) provides guidance acceptable to the NRC staff for the protection of control room operators against an accidental release of hazardous chemicals.

RG 1.95 “Protection of Nuclear Power Plant Control Room Operators against an Accidental Chlorine Release,” Revision 1, dated January 1977 (Withdrawn, ADAMS Accession Nos. ML12298A134 and ML14240A599) described design features and procedures that were acceptable to the NRC staff for the protection of nuclear plant control room operators against an accidental chlorine release.

Prior to incorporation of TSTF-448, Revision 3, the STSs addressing CRE boundary operability resided only in NUREG-1430, STS 3.7.10, “Control Room Emergency Ventilation System (CREVS).” In this STS, the SR associated with demonstrating the operability of the CRE boundary required verifying that one CRVS train can maintain a positive pressure relative to the areas adjacent to the CRE during the pressurization mode of operation at a makeup flow rate. Facilities that pressurize the CRE during the emergency mode of operation of the CRVS have similar SRs. Other facilities that do not pressurize the CRE have only a system flow rate criterion for the emergency mode of operation. Regardless of the CRE design, the results of ASTM E741 tracer gas tests to measure CRE unfiltered inleakage at facilities indicated that the differential pressure surveillance (or the alternative surveillance at non-pressurization facilities) is not a reliable method for demonstrating CRE boundary operability. That is, licensees were able to obtain differential pressure and flow measurements satisfying the SR limits even though unfiltered inleakage was determined to exceed the value assumed in the safety analyses. In addition to an inadequate SR, the action requirements of these specifications were ambiguous regarding CRE boundary operability in the event CRE unfiltered inleakage is found to exceed the analysis assumption. The ambiguity stemmed from the view that the CRE boundary may be considered operable but degraded in this condition, and that it would be deemed inoperable only if calculated radiological exposure limits for CRE occupants exceeded a licensing basis limit; e.g., as stated in General Design Criterion (GDC) 19, even while crediting compensatory measures.

NRC Administrative Letter (AL) 98-10, “Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety,” dated December 29, 1998 (ADAMS Accession No. ML031110108), states, “the discovery of an improper or inadequate TS value or required action is considered a degraded or nonconforming condition,” which is defined in NRC Inspection Manual Chapter (IMC) 0326, “Operability Determinations & Functionality Assessments for Conditions Adverse to Quality or Safety,” dated November 20, 2017 (ADAMS Accession No. ML17324A837). Imposing administrative controls in response to an improper or inadequate TS is considered an acceptable short-term corrective action. The NRC staff expects

that, following the imposition of administrative controls, an amendment to correct the inadequate TS, with appropriate justification and schedule, will be submitted in a timely fashion. Licensees that have found unfiltered inleakage in excess of the limit assumed in the safety analyses and have yet to either reduce the inleakage below the limit or establish a higher bounding limit through re-analysis, have implemented compensatory actions to ensure the safety of CRE occupants, pending final resolution of the condition, consistent with IMC-0326. However, based on GL 2003-01 and AL 98-10, the NRC staff expects each licensee to propose TS changes that include a surveillance to periodically measure CRE unfiltered inleakage in order to satisfy 10 CFR 50.36(c)(3), which requires a facility's TS to include surveillance requirements, which it defines as "requirements relating to test, calibration, or inspection to assure ... that limiting conditions for operation will be met."

The NRC staff also expects facilities to propose unambiguous remedial actions, consistent with 10 CFR 50.36(c)(2), for the condition of not meeting the LCO because of an inoperable CRE boundary. The action requirements should specify a reasonable completion time to restore conformance to the LCO before requiring a facility to be shut down. This completion time should be based on the benefits of implementing mitigating actions to ensure CRE occupant safety and sufficient time to resolve most problems anticipated with the CRE boundary, while minimizing the chance that operators in the CRE will need to use mitigating actions during accident conditions.

#### *Licensing and Design Basis*

The staff's model safety evaluation for TSTF-448, Revision 3, uses the GDC described in 10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants." The model safety evaluation states that that GDC 1, 2, 3, 4, 5, and 19 apply to CRE habitability. These GDC are summarized as follows.

- GDC 1, "Quality standards and records," requires that structures, systems, and components (SSCs) important to safety be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety functions performed.
- GDC 2, "Design basis for protection against natural phenomena," requires that SSCs important to safety be designed to withstand the effects of natural phenomena, such as earthquakes, tornadoes, hurricanes, floods, tsunamis, and seiches without loss of capability to perform their safety functions.
- GDC 3, "Fire protection," requires SSCs important to safety be designed and located to minimize, consistent with other safety requirements, the effects of fires and explosions.
- GDC 4, "Environmental and dynamic effects design bases," requires SSCs 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 LOCAs.
- GDC 5, "Sharing of structures, systems, and components," requires that SSCs important to safety not be shared among nuclear power units unless it can be shown that such sharing will not significantly impair their ability to perform their safety functions, including, in the event of an accident in one unit, the orderly shutdown and cooldown of the remaining units.

- GDC 19, "Control room," requires that a control room be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain the reactor in a safe condition under accident conditions, including a LOCA. Adequate radiation protection is to be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of specified values.

The Atomic Energy Commission (AEC) issued the construction permits for Oconee on November 6, 1967. The AEC issued the operating licenses for the three units on February 6, 1973, October 6, 1973, and July 19, 1974. The plants' GDC are discussed in the UFSAR, Chapter 3.1, "Conformance with NRC General Design Criteria," and in the applicable UFSAR sections. The AEC published the final rule that added 10 CFR Part 50, Appendix A in the FR on February 20, 1971 (36 FR 3255), with the rule effective on May 21, 1971. In accordance with an NRC staff requirements memorandum from S. J. Chilk to J. M. Taylor, "SECY-92-223 - Resolution of Deviations Identified during the Systematic Evaluation Program," dated September 18, 1992 (ADAMS Accession No. ML003763736), the Commission decided not to apply the Appendix A GDC to plants with construction permits issued prior to May 21, 1971. Therefore, the GDC which constitute the licensing bases for Oconee are those in the UFSAR. As discussed in the UFSAR, the licensee made changes to the facilities and committed to some of the GDC from 10 CFR Part 50, Appendix A.

In GL 2003-01, the staff requested licensees to provide confirmation that their facility's control room meets the applicable habitability regulatory requirements (e.g., GDC 1, 3, 4, 5, and 19) and that the control room habitability systems are designed, constructed, configured, operated, and maintained in accordance with the facility's design and licensing basis. In its letter dated December 9, 2003 (ADAMS Accession No. ML033510109), the licensee responded to GL 2003-01 and provided a discussion of how the Oconee licensing basis for the control room compared to GDC 1, 3, 4, 5, and 19. For its review of the licensee's application dated March 30, 2017, as supplemented, the staff determined that the design bases discussed in the licensee's letter dated December 9, 2003, meet the intent GDC 1, 3, 4, 5, and 19. Because the staff's model safety evaluation for TSTF-448, Revision 3, also uses GDC 2, which was not discussed in GL 2003-01, the staff reviewed Section 3.1.2, "Criterion 2 – Performance Standards (Category A)," of the UFSAR and determined that the design basis discussed therein meets the intent of GDC 2 for this application.

The supporting documentation for License Amendment Nos. 338, 339, and 339 used an AST methodology for analyzing the radiological consequences of the DBA using RG 1.183. The staff also considered relevant information in Chapter 15, "Accident Analysis," of the UFSAR, which describes the DBAs and evaluates their radiological consequences.

### 3.0 TECHNICAL EVALUATION

In determining whether an amendment to a license will be issued, the Commission is guided by the considerations that govern the issuance of initial licenses to the extent applicable and appropriate. The staff evaluated the licensee's application to determine if the proposed changes are consistent with the regulations and licensing and design basis information discussed in Section 2 of this safety evaluation. The staff reviewed the proposed changes against the corresponding changes made to the STSs by TSTF-448, Revision 3, which the NRC staff has found to satisfy applicable regulatory requirements, as described in Section 2.0 of this safety evaluation. The emergency operational mode of the CRVS booster fans pressurizes the

CRE to minimize unfiltered air inleakage. The proposed changes are consistent with this design.

### 3.1 TS 3.7.9 LCO Note

In its application dated March 30, 2017, the licensee proposed to modify the CRVS booster fan LCO by adding a note that stated, "The control room envelope (CRE) boundary may be opened intermittently under administrative controls." The licensee also provided TS bases for the proposed note, which stated, in part:

This Note only applies to openings in the CRE boundary that can be rapidly restored to the design condition, such as doors, hatches, floor plugs, and access panels. For entry and exit through doors, the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls should be proceduralized and consist of stationing a dedicated individual at the opening who is in continuous communication with operators in the CRE. This individual will have a method to rapidly close the opening and to restore the CRE boundary to a condition equivalent to the design condition when a need for CRE isolation is indicated.

The staff found that the proposed note did not appear to be consistent with the licensing basis for the radiological consequence evaluation for the maximum hypothetical accident, which assumes that the control room boundary is intact and a positive pressure is established at 30 minutes after occurrence of the maximum hypothetical accident by the CRVS booster fan trains. The proposed LCO note appeared to allow the CRE boundary to be opened indefinitely. The LCO note, as proposed in the letter dated March 30, 2017, would not ensure that the dedicated individual will restore the CRE boundary to a condition equivalent to the design condition within the timing assumed in the radiological consequence analysis for the maximum hypothetical accident. The proposed note could have led to operation outside of the licensing basis because it did not ensure mitigation of the radioactive releases will occur as assumed in the licensing basis. Therefore, in its email dated September 7, 2017, the staff requested that the licensee justify why the LCO note for TS 3.7.9 was not consistent with the NRC-approved design basis as provided in Amendment Nos. 338, 339, and 339 and as reflected in UFSAR Chapter 15 or, as an alternative, provide an LCO note for TS 3.7.9 that was consistent with the NRC-approved design basis or a revised radiological consequence analyses for the fuel handling accident and maximum hypothetical accident that does not assume credit of filtration by the CRVS.

In its supplement dated October 16, 2017, the licensee responded to the staff's request and stated that it agreed with the staff's concern about the proposed note and, therefore, revised its proposed note for TS 3.7.9 LCO to state:

The control room envelope (CRE) boundary may be opened intermittently under administrative control if it is confirmed by analysis that the CRE boundary can be restored and the CRE pressurized in time to ensure accident analysis assumptions remain valid.

The licensee also revised the TS 3.7.9 Bases for the note to state:

The LCO is modified by a Note allowing the CRE boundary to be opened intermittently under administrative controls. This Note only applies to openings in

the CRE boundary that can be rapidly restored to the design condition, such as doors, hatches, floor plugs, and access panels, so that the CRE boundary can be restored and the CRE pressurized within 30 minutes to minimize inleakage as assumed in the station's Alternate Source Term (AST) accident analysis. For entry and exit through doors, the administrative control of the opening is performed by the person(s) entering or exiting the area. For other openings, these controls should be proceduralized and consist of stationing a dedicated individual at the opening who is in continuous communication with operators in the CRE. This individual will have a method to rapidly close the opening and to restore the CRE boundary to a condition equivalent to the design condition when a need for CRE isolation is indicated.

The staff reviewed the licensee's proposed change and has determined that it is consistent with the design basis as approved by Amendment Nos. 338, 339, and 339 and as reflected in Chapter 15 of the UFSAR. In addition, the proposed change provides reasonable assurance that the mitigation of the radioactive releases will occur as assumed in the Oconee licensing basis. Therefore, the staff finds this proposed change meets 10 CFR 50.36(c)(2) and 10 CFR 50.67 and is acceptable.

### 3.2 TS 3.7.9 Applicability

In its application dated March 30, 2017, the licensee proposed to revise the LCO applicability from "MODES 1, 2, 3, and 4, During movement of recently irradiated fuel assemblies," to "MODES 1, 2, 3, 4, 5, and 6, During movement of recently irradiated fuel assemblies for any unit." The staff determined that the proposed change clarifies that the CRVS booster fan trains are required to be operable when the licensee is moving recently irradiated fuel assemblies for any unit. In addition, it adds the requirement for the CRVS booster fan trains to be operable in MODES 5 and 6. This proposed change ensures the CRVS booster fan train operation will remain consistent with the licensing basis. It also provides reasonable assurance that the CRVS booster fans will be operable and that the radiological dose to CRE occupants will remain below the regulatory limits. The staff determined that the proposed change does not impact the radiological consequence analyses for the DBAs in the current licensing basis as reflected in Chapter 15 of the UFSAR. Therefore, the staff finds the proposed change meets 10 CFR 50.36(c)(2) and 10 CFR 50.67 and is acceptable.

### 3.3 TS 3.7.9 Actions

In its application dated March 30, 2017, as supplemented, the licensee proposed to replace the current set of five action statements in TS 3.7.9 with a set of eight action statements that include new or revised conditions, required actions, and completion times, as follows.

*Proposed Action A*

The licensee proposed to replace the current Action B (i.e., existing prior to this amendment), as follows:

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CRVS Booster Fan train inoperable for reasons other than Condition B.	A.1 Restore CRVS Booster Fan train to OPERABLE status.	7 days

TS 3.7.9 Action B currently requires the licensee to restore the CRVS booster fan train to operable status in 72 hours if one CRVS booster fan train is inoperable for reasons other than Condition A (i.e., if the CRE boundary is inoperable). The licensee proposed to re-letter this action or condition from B to A and re-letter the existing Action A to Acton B. In addition, the licensee proposed to extend the Completion Time from 72 hours to 7 days. The proposed extension of the Completion Time appeared to be a deviation from TSTF-448, Revision 3, which the licensee did not address in its application dated March 30, 2017. When it compared Oconee's design to that assumed for the STSs, the staff identified that the TS Bases and UFSAR imply that both 50 percent capacity outside air booster fans are needed to perform the design function, which is not consistent with the design assumed for the STSs. Because the UFSAR did not clearly explain what was assumed in the AST, the staff could not ascertain whether the licensee analyzed the radiological consequence analysis for operation of only one train. Therefore, in its email dated September 7, 2017, the staff requested the licensee to provide a justification for the proposed Completion Time extension from 72 hours to 7 days, including an explanation of whether the CRVS booster fan trains are redundant, and whether one CRVS booster fan train can perform the specified safety functions assumed in the DBA radiological consequence analysis for the maximum hypothetical accident. The staff requested the licensee to explain whether a single train can (1) operate for 30 days following a postulated maximum hypothetical accident, (2) maintain a positive control room pressure to ensure outward leakage thereby preventing unfiltered air inleakage into the control room from exceeding the assumed 40 cfm, and (3) provide the filter efficiencies of 99 percent for aerosol and elemental iodine and 95 percent for organic iodine assumed in the radiological consequence analysis.

In its letter dated October 16, 2017, the licensee responded to the staff's request for additional information. The staff reviewed the licensee's response and the previous communications between the licensee and the NRC regarding GL 2003-01. The staff was able to ascertain that the radiological consequence analysis was analyzed using only one CRVS booster fan train. With regards to the CRVS booster fan trains being redundant, the licensee stated in its letter dated October 16, 2017:

In addressing the Staffs questions on train redundancy, mission time, inleakage, and filters, for each ONS [Oconee] control room, the CRVS booster fans are fully redundant mechanically but there are some electrical configuration aspects that prevent them from being truly considered fully redundant, e.g., the control dampers on Unit 3 are electrically fed from the same source...

The staff reviewed this statement against the proposed changes to TS 3.7.9. While in MODES 1, 2, 3, or 4, if the CRVS booster fan train becomes inoperable for reasons other than Condition B (i.e., an inoperable CRE) and the cause of the inoperability does not cause both

trains to be inoperable, then the new Condition A would be entered. Condition A would allow restoration within 7 days because of the ability of the remaining CRVS booster fan train to provide the design functions assumed in the licensing basis. In this case, one CRVS booster fan train remains operable to perform the CRE occupant protection function. Because the CRVS booster fan train is able to provide the required capability stated in the licensing basis, and the proposed change does not impact the radiological consequence analyses for the DBAs in the current licensing basis as reflected in Chapter 15 of the UFSAR, the staff finds the change in Completion Time from 72 hours to 7 days meets 10 CFR 50.36(c)(2) and 10 CFR 50.67 and, therefore, is acceptable.

*Proposed Action B*

The licensee proposed to replace the existing Action A with a new Action B as follows.

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more CRVS Booster Fan trains inoperable due to inoperable CRE boundary in MODE 1, 2, 3, or 4.	B.1 Initiate action to implement mitigating actions.	Immediately
	<u>AND</u>	
	B.2 Verify mitigating actions ensure CRE occupant radiological exposures will not exceed limits and CRE occupants are protected from chemical and smoke hazards.	24 hours
	<u>AND</u>	
	B.3 Restore CRE boundary to OPERABLE status.	90 days

The licensee proposed this new action requirement in TS 3.7.9 for an inoperable CRE boundary. Action A of TS 3.7.9 (prior to this amendment) requires that if the control room pressure is determined to be less than or equal to ( $\leq$ ) 0.0 pounds per square inch gauge (psig) during operation of two CRVS booster fan trains and thus results in an inoperable CRE boundary while in MODES 1, 2, 3, or 4 or during movement of recently irradiated fuel assemblies, then the licensee must restore the control room pressure to greater than 0.0 psig (i.e., restore the CRE boundary) during operation of two CRVS booster fan trains in 30 days.

This existing Action is more restrictive than would be appropriate during MODES 1, 2, 3, or 4 while in situations for which CRE occupant implementation of compensatory measures or mitigating actions would temporarily afford adequate CRE occupant protection from postulated airborne hazards. To account for the inoperability in MODES 1, 2, 3, or 4, the licensee proposed to revise the requirements to add a new Condition B as stated above. The proposed Completion Time would allow 90 days to restore the CRE boundary to operable status and, consequently, restore the affected CRVS booster fan trains to operable status if mitigating actions are immediately implemented and the licensee verifies within 24 hours that in the event of a DBA, CRE occupant radiological exposures will not exceed the calculated dose of the

licensing basis analyses of DBA consequences and that CRE occupants are protected from hazardous chemicals and smoke.

The NRC staff finds that the 24-hour Completion Time of the proposed new Required Action B.2 is reasonable based on the use of mitigating actions and the low probability of a DBA occurring during this time period. The 90-day Completion Time is reasonable because the mitigating actions will ensure protection of CRE occupants within analyzed limits while limiting the probability that CRE occupants will have to implement protective measures that may adversely affect their ability to control the reactor and maintain it in a safe shutdown condition in the event of a DBA. The 90-day Completion Time of the proposed new Required Action B.3 is a reasonable time to diagnose, plan, and possibly repair and test most anticipated problems with the CRE boundary.

In Section 2.2 of its application dated March 30, 2017, the licensee discussed its proposed variations from TSTF-448, Revision 3. The licensee proposed a variation from Required Action B.2 of TSTF-448, Revision 3, which states, "Verify mitigating actions ensure CRE occupant exposures to radiological, chemical, and smoke hazards will not exceed limits." Because there are no chemical and smoke limit requirements for the control rooms, the licensee proposed Required Action B.2 to read, "Verify mitigating actions ensure CRE occupant radiological exposures will not exceed limits, and CRE occupants are protected from chemical and smoke hazards."

The staff reviewed RG 1.78, RG 1.95, and UFSAR Sections 2.2.3.1.3, 6.4.2.5, 7.7.5, 9.4.1, and 15.0. RG 1.78 and RG 1.95 were cited guidance documents in UFSAR Section 6.4.2.5, "Toxic Gas Protection." This UFSAR section also cited Calculation, "OSC-6206, 'Evaluation of Potential Off-Site Toxic Gas Releases,'" which the staff audited, as discussed in Section 1 of this safety evaluation. The staff reviewed these documents and concludes that there are no chemical and smoke limit requirements for the control rooms; therefore, the licensee's proposed variation is acceptable.

Based on its review as discussed above, the staff finds that the addition of the proposed new Action B and deletion of existing Action A meet 10 CFR 50.36(c)(2) and 10 CFR 50.67 and, therefore, are acceptable.

*Proposed Action C*

The licensee proposed to replace the existing Action D with the proposed Action C as follows.

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1 Be in MODE 3.	12 hours
	AND	
	C.2 Be in MODE 5.	36 hours

The licensee proposed to re-letter existing Condition D, which states, "Required Action and associated Completion Time not met in MODE 1, 2, 3, or 4," to Condition C," and revise it to state, "Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4."

The NRC staff finds the proposed change is a conforming change that is required based on the acceptable changes to Actions A and B as previously discussed, is editorial, and does not impact the previously analyzed DBAs' radiological consequences. The staff finds the proposed change meets 10 CFR 50.36(c)(2) and 10 CFR 50.67 and, therefore, is acceptable.

*Proposed Action D*

The licensee proposed to replace the existing Action E with new Actions D and E. The proposed Action D is as follows.

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of recently irradiated fuel assemblies.	D.1 Start the OPERABLE CRVS Booster Fan train.	Immediately
	<u>OR</u> D.2 Suspend movement of recently irradiated fuel assemblies.	Immediately

Prior to this amendment, TS 3.7.9 did not require any Actions to be taken in MODES 5 and 6 if the CRVS booster fan trains were not operable. Therefore, the licensee proposed to re-letter existing Condition E, which states, "Required Action and associated Completion Time not met during movement of recently irradiated fuel assemblies," to Condition D and revise it to state, "Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of recently irradiated fuel assemblies." In addition, the licensee proposed to add a new Required Action D.1 that will allow the option to immediately start the operable CRVS booster fan train instead of immediately suspending movement of recently irradiated fuel assemblies. The new Required Action D.1 places the operable CRVS booster fan train in operation so that if a DBA were to occur, the CRVS booster fan train would keep CRE occupant safety within licensing basis limits.

While in MODES 5 and 6, the proposed Action D would ensure that the CRVS booster fan train operation is consistent with the Oconee licensing basis and prevents the occurrence of a fuel handling DBA. The proposed Required Action D.1 is acceptable because it places the operable CRVS booster fan train in operation, which does not impact the radiological consequence analyses for the DBAs in the current licensing basis as reflected in Chapter 15 of the UFSAR. The proposed Action D.1 provides reasonable assurance that the CRVS booster fans will be operable and that the radiological dose to CRE occupants will remain below the regulatory limits. The proposed Action D.2 removes the possibility of the occurrence of a fuel handling DBA by not allowing movement of recently irradiated fuel assemblies. The proposed Action D does not impact the radiological consequences analyses for the DBAs in the current licensing basis as reflected in Chapter 15 of the UFSAR; therefore, the staff finds the proposed change meets 10 CFR 50.36(c)(2) and 10 CFR 50.67 and is acceptable.

*Proposed Action E*

The licensee proposed to replace the existing Action E with new Actions D and E. The proposed Action E is as follows.

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. Two CRVS Booster Fan trains inoperable in MODE 5 or 6, or during movement of recently irradiated fuel assemblies.</p> <p><u>OR</u></p> <p>One or more CRVS Booster Fan trains inoperable due to an inoperable CRE boundary in MODE 5 or 6, or during movement of recently irradiated fuel assemblies.</p>	<p>E.1 Suspend movement of recently irradiated fuel assemblies.</p>	<p>Immediately</p>

Prior to this amendment, TS 3.7.9 did not require any Actions to be taken in MODES 5 and 6 if the CRVS booster fan trains were not operable. Therefore, to account for addition of MODES 5 and 6 to the applicability statement and to account for the inoperability of the two CRVS booster fan trains during movement of recently irradiated fuel assemblies, the licensee proposed to add Action E, which would contain a new Condition E that states:

Two CRVS Booster Fan trains inoperable in MODE 5 or 6, or during movement of recently irradiated fuel assemblies.

OR

One or more CRVS Booster Fan trains inoperable due to an inoperable CRE boundary in MODE 5 or 6, or during movement of recently irradiated fuel assemblies.

New Action E would immediately suspend movement of recently irradiated fuel assemblies. During MODES 5 or 6 or movement of recently irradiated fuel assemblies, it is appropriate to immediately suspend fuel movements if the CRVS booster fan trains are unable to ensure the CRE occupant safety within licensing basis limits for any reason. The proposed Action E removes the possibility of the occurrence of a fuel handling DBA. Because proposed Action E does not impact the radiological consequence analyses for the DBAs in the current licensing basis as reflected in Chapter 15 of the UFSAR, the staff finds the proposed change meets 10 CFR 50.36(c)(2) and 10 CFR 50.67 and is acceptable.

*Proposed Action F*

The licensee proposed to replace the existing Action C with new Action F as follows.

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. Two CRVS Booster Fan trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	F.1 Restore one CRVS Booster Fan train to OPERABLE status.	24 hours

If both CRVS booster fan trains are found to be inoperable for reasons other than an inoperable CRE, as would be the case if the specific electrical configuration to the control dampers on Unit 3 was found to be inoperable, then the licensee must enter existing Condition C which states, "Two CRVS Booster Fan trains inoperable for reasons other than Condition A." Existing Condition C is applicable while in MODE 1, 2, 3, and 4 and during movement of recently irradiated fuel assemblies. The licensee proposed to re-letter the Condition from C to F and revise it to state, "Two CRVS Booster Fan trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B."

The NRC staff finds this to be acceptable because it does not impact the radiological consequence analyses for the DBAs in the current licensing basis as reflected in Chapter 15 of the UFSAR. The staff finds the proposed change meets 10 CFR 50.36(c)(2) and, therefore, is acceptable.

*Proposed Action G*

The licensee proposed a new Action G as follows.

CONDITION	REQUIRED ACTION	COMPLETION TIME
G. Required Action and associated Completion Time of Condition F not met.	G.1 Enter LCO 3.0.3.	Immediately

The licensee proposed to establish a new Action G that would require immediately entering LCO 3.0.3 if the required action and associated Completion Time of the new Condition F is not met. The staff determined that if the new Required Action F.1 cannot be met (i.e., if one CRVS booster fan train cannot be restored to operable status within 24 hours while the CRE boundary is operable), then it is appropriate for the licensee to enter LCO 3.0.3 and initiate action within one hour to place the three Oconee units in MODE 3 within 12 hours, MODE 4 within 18 hours, and MODE 5 within 37 hours. Because the CRVS booster fan trains would not be operable and thus not capable of keeping radiological dose to CRE occupants below the licensing basis limits upon occurrence of a DBA, the staff determined it would be appropriate to enter LCO 3.0.3 and shut down the three Oconee units. This proposed change is acceptable because it places the three Oconee units in MODE 5, which minimizes the probability of a LOCA occurring due to the reduced pressures and temperatures in this mode. Radiological consequences are not analyzed for LOCAs that occur in a shutdown condition. The staff determined that this proposed change does not impact the radiological consequence analyses for the DBAs in the

current licensing basis as reflected in Chapter 15 of the UFSAR. Therefore, the staff finds the proposed change meets 10 CFR 50.36(c)(2) and 10 CFR 50.67 and is acceptable.

### 3.4 TS 3.7.9 SRs

In its application dated March 30, 2017, as supplemented by letters dated May 11, and October 16, 2017, the licensee proposed to modify SR 3.7.9.3 and renumber it to SR 3.7.9.5 and add two new SRs (i.e., SR 3.7.9.3 and 3.7.9.4). The existing SR 3.7.9.3 states, "Verify two CRVS Booster Fan trains can maintain the Control Room at a positive pressure." The licensee proposed to renumber this SR to SR 3.7.9.5 and revise it to state, "Verify the system makeup flow rate is  $\geq 1215$  and  $\leq 1485$  cfm when supplying the control room with outside air." The licensee did not propose any changes to the SR's frequency requirement. The licensee proposed to add a new SR 3.7.9.3 that would state, "Verify the control room isolates on a manual actuation signal," at a required frequency that would state, "In accordance with the Surveillance Frequency Control Program." The licensee proposed to add the new SR 3.7.9.4 that would state, "Perform required CRE unfiltered air leakage testing in accordance with the Control Room Envelope Habitability Program," at a required frequency that would state, "In accordance with the Control Room Envelope Habitability Program." As discussed in the next section of this safety evaluation, the CRE Habitability Program establishes the testing frequencies in paragraphs c and f and is incorporated in new TS 5.5.23; accordingly, changes to the testing frequencies would require a license amendment under 10 CFR 50.90.

These three SRs are requirements relating to test, calibration, or inspection which assure that the necessary quality of the CRVS and its components are maintained, that facility operation will be within safety limits, and that the TS LCO 3.7.9 will be met. These SRs do not impact the radiological consequence analyses for the DBAs in the current licensing basis as reflected in Chapter 15 of the UFSAR. The staff finds the proposed changes meet 10 CFR 50.36(c)(3) and 10 CFR 50.67 and, therefore, are acceptable.

### 3.5 TS 5.5.23 – CRE Habitability Program

In its application dated March 30, 2017, the licensee proposed adding new TS 5.5.23, "Control Room Envelope Habitability Program," to the Administrative Controls TSs that would state:

A Control Room Envelope (CRE) Habitability Program shall be established and implemented to ensure that CRE habitability is maintained such that, with an OPERABLE Control Room Ventilation System, CRE occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event, hazardous chemical release, or a smoke challenge. The program shall ensure that adequate radiation protection is provided to permit access and occupancy of the CRE under design basis accident (DBA) conditions without personnel receiving radiation exposures in excess of 5 rem total effective dose equivalent (TEDE) for the duration of the accident.

The program shall include the following elements:

- a. The definition of the CRE and the CRE boundary.
- b. Requirements for maintaining the CRE boundary in its design condition including configuration control and preventive maintenance.

- c. Requirements for (i) determining the unfiltered air leakage past the CRE boundary into the CRE in accordance with the testing methods and at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and (ii) assessing CRE habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.
- d. Measurement, at designated locations, of the CRE pressure relative to all external areas adjacent to the CRE boundary during the pressurization mode of operation by one train of the CRVS, operating at the flow rate required by the VFTP, at a frequency of 24 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the 24-month assessment of the CRE boundary.
- e. The quantitative limits on unfiltered air leakage into the CRE. These limits shall be stated in a manner to allow direct comparison to the unfiltered air leakage measured by the testing described in paragraph c. The unfiltered air leakage limit for radiological challenges is the leakage flow rate assumed in the licensing basis analyses of DBA consequences. Unfiltered air leakage limits for hazardous chemicals must ensure that exposure of CRE occupants to these hazards will be within the assumptions in the licensing basis.
- f. The provisions of SR 3.0.2 are applicable to the Frequencies for assessing CRE habitability, determining CRE unfiltered leakage, and measuring CRE pressure and assessing the CRE boundary as required by paragraphs c and d, respectively.

The licensee also proposed renumbering TS pages and a revised TS Table of Contents as conforming changes to the new program description.

As described in the NRC staff's model safety evaluation for TSTF-448, Revision 3, the NRC staff provided guidance to licensees explaining that an acceptable CRE Habitability Program contains the following elements.

- Definitions of CRE and CRE boundary. This element provides assurance that these definitions accurately describe the plant areas that are within the CRE and the interfaces that form the CRE boundary and are consistent with the general definitions discussed in Section 2.1 of this safety evaluation. Establishing what is meant by the CRE and the CRE boundary will preclude ambiguity in the implementation of the program.
- Configuration control and preventive maintenance of the CRE boundary. This element provides assurance that the CRE boundary is maintained per its design requirements. Guidance for implementing this element is contained in RG 1.196, which endorsed Nuclear Energy Institute Report 99-03, "Control Room Habitability Assessment Guidance," Revision 0, dated June 2001 (ADAMS Accession No. ML020600236), with exceptions. Maintaining the CRE boundary per its design requirements provides assurance that its leak-tightness will not significantly degrade between CRE leakage determinations.

- Assessment of CRE habitability at the frequencies stated in Sections C.1 and C.2 of RG 1.197, Revision 0, and measurement of unfiltered air leakage into the CRE in accordance with the testing methods and at the frequencies stated in Sections C.1 and C.2 of RG 1.197, Revision 0. This element provides assurance that the plant assesses CRE habitability consistent with Sections C.1 and C.2 of RG 1.197, Revision 0. Assessing CRE habitability at NRC-accepted frequencies provides assurance that significant degradation of the CRE boundary will not go undetected between CRE inleakage determinations. Determination of CRE inleakage using NRC-approved test methods assures that test results are reliable for ascertaining CRE boundary operability. Determination of CRE inleakage at the NRC-accepted frequencies provides assurance that significant degradation of the CRE boundary will not occur between CRE inleakage determinations.
- Measurement of CRE pressure with respect to all areas adjacent to the CRE boundary at designated locations for use in assessing the CRE boundary at a frequency of 24 months on a staggered test basis (with respect to the CRVS booster fan trains). This element provides assurance that CRE differential pressure is regularly measured to identify changes in pressure warranting evaluation of the condition of the CRE boundary. Obtaining and trending pressure data provides additional assurance that significant degradation of the CRE boundary will not go undetected between CRE inleakage determinations.
- Quantitative limits on unfiltered inleakage. This element establishes the CRE inleakage limit as the CRE unfiltered infiltration rate assumed in the CRE occupant radiological consequence analyses of DBAs. Having an unambiguous criterion for the CRE boundary to be considered operable in order to meet LCO 3.7.9 will ensure that associated action requirements will be consistently applied in the event of CRE degradation resulting in inleakage exceeding the limit.

The proposed TS 5.5.23 is consistent with TSTF-448, Revision 3. SR 3.7.9.4 and TS 5.5.23 provide assurance that the operability of the CRE boundary which, as part of an operable CRVS, will ensure that CRE habitability is maintained such that CRE occupants can control the reactor safely under normal conditions and maintain it in a safe condition following a radiological event, hazardous chemical release, or a smoke challenge. The program ensures that adequate radiation protection is provided to permit access and occupancy of the CRE under DBA conditions without personnel receiving radiation exposures in excess 5 rem TEDE for the duration of the accident.

Consistent with TSTF-448, Revision 3, the licensee's proposed CRE Habitability Program states in TS 5.5.23.f that the provisions of SR 3.0.2 are applicable to the program frequencies for performing the activities required by program paragraph c, parts (i) and (ii) (assessment of CRE habitability and measurement of CRE inleakage), and paragraph d (measurement of CRE differential pressure). SR 3.0.2 is applicable to the surveillance that references the testing in the CRE Habitability Program. However, SR 3.0.2 is not applicable to Administrative Controls TSs unless specifically invoked. Invoking this statement in the CRE Habitability Program eliminates any confusion regarding whether SR 3.0.2 is applicable and, therefore, is acceptable.

Consistent with TSTF-448, Revision 3, proposed TS 5.5.23 states that (1) a CRE Habitability Program shall be established and implemented, (2) the program shall include all of the NRC-staff required elements, as described above, and (3) the provisions of SR 3.0.2 shall apply to program frequencies. The staff finds that the proposed TS 5.5.23 is consistent with the

program approved by the NRC staff in TSTF-448, Revision 3, and meets 10 CFR 50.36(c)(5) and, therefore, is acceptable. The staff also finds the proposed renumbering of the TS pages and the TS Table of Contents line item for Section 5.6, "Reporting Requirements," acceptable.

### 3.6 Impact of TS changes on Radiological Consequences

The staff reviewed the radiological impact of the licensee's proposed changes to TS 3.7.9 and TS 5.5.23 on previously analyzed radiological consequences of the postulated DBAs at Oconee. The staff finds that the licensee's proposed changes do not impact any of the methodologies, assumptions or inputs of the radiological consequences analyses and there is reasonable assurance that the licensee's estimates of the exclusion area boundary, low population zone, and control room doses will remain unchanged and continue to comply with the criteria stated in Section 2.0 of this safety evaluation. Therefore, the staff finds the proposed changes to TS 3.7.9 and TS 5.5.23 are acceptable with regard to the radiological consequences of postulated DBAs, and the DBA radiological consequences will continue to meet the requirements discussed in Section 2.0 of this safety evaluation and, therefore, are acceptable.

### 3.7 New License Condition

The NRC staff prepared a model license amendment request, which was published in the *Federal Register* on January 17, 2007 (72 FR 2022), that provides the expected level of detail and content for an application to revise plant TSs according to TSTF-448, Revision 3. In its application dated March 30, 2017, the licensee proposed the following new license condition for each unit's operating license regarding the initial performance of the new surveillance and assessment requirements, consistent with Section 2.3 of the NRC staff's model application published in the *Federal Register* on January 17, 2007 (72 FR 2022), but with variations to reflect plant-specific applicability.

Upon implementation of the Amendment adopting TSTF-448, Revision 3, the determination of CRE unfiltered air in-leakage as required by TS SR 3.7.9.4, in accordance with TS 5.5.23.c.(i); the assessment of CRE habitability as required by TS 5.5.23.c.(ii); and the measurement of pressure as required by TS 5.5.23.d, shall be considered met. Following implementation:

- (a) The first performance of SR 3.7.9.4 in accordance with Specification 5.5.23.c.(i), shall be within the specified Frequency of 6 years, plus the 18 month (25% [percent]) allowance of SR 3.0.2, as measured from the date of the most recent successful tracer gas test, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.
- (b) The first performance of the periodic assessment of CRE habitability, TS 5.5.23.c.(ii), shall be within 3 years, plus the 9 month (25%) allowance of SR 3.0.2, as measured from the date of the most recent successful tracer gas test or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.
- (c) The first performance of the periodic measurement of CRE pressure, TS 5.5.23.d shall be within 24 months plus the 6 months allowed by SR 3.0.2, as measured from the most recent successful pressure measurement test, or within 6 months if not performed previously.

The staff finds that the proposed plant-specific license condition is consistent with the model application and, therefore, is acceptable. The staff made an editorial revision to the first sentence of each unit's new license condition to have it state, "Upon implementation of Amendment No. [408, 410, or 409, as applicable] adopting TSTF-448..." for clarity. The staff added the new license condition as Condition J to each unit's renewed facility operating license.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the staff notified the State of South Carolina officials (i.e., Ms. Susan Jenkins, Manager, Infectious and Radioactive Waste Management; and Mr. Crispulo Isiminger, Manager, Environmental Health, of the South Carolina Department of Health and Environmental Control) by telephone and email on January 12, 2018 (ADAMS Accession No. ML18017A008), of the proposed issuance of the amendments. The State officials had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change SRs and requirements with respect to the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20. The 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, which was published in the *Federal Register* on July 18, 2017 (82 FR 32879). 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

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

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Date: April 12, 2018

SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 – ISSUANCE OF AMENDMENTS REGARDING THE TECHNICAL SPECIFICATIONS FOR CONTROL ROOM HABITABILITY (CAC NOS. MF9555, MF9556, AND MF9557; EPID L-2017-LLA-0219) DATED APRIL 12, 2018

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**\*by email**

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