

July 25, 2008

Mr. Benjamin Waldrep, Vice President
Brunswick Steam Electric Plant
Carolina Power & Light Company
Post Office Box 10429
Southport, North Carolina 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 - ISSUANCE OF
AMENDMENTS REGARDING CONTROL ROOM ENVELOPE HABITABILITY IN
ACCORDANCE WITH TSTF-448 (TAC NOS. MD6336 AND MD6337)

Dear Mr. Waldrep:

The Commission has issued the enclosed Amendment No. 248 to Renewed Facility Operating License No. DPR-71 and Amendment No. 276 to Facility Operating License No. DPR-62 for Brunswick Steam Electric Plant, Units 1 and 2. The amendments are in response to your application dated July 17, 2007, as supplemented by letters dated February 27 and July 9, 2008. The amendments revise the technical specifications (TS) to adopt TSTF-448, Revision 3, "Control Room Habitability." The amendments also add a license condition regarding initial performance of new surveillance and assessment requirements. This TS improvement was made available by the U.S. Nuclear Regulatory Commission (Commission) on January 17, 2007 (72 FR 2022) as part of the consolidated line item improvement process.

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

Sincerely,

/RA/

Farideh E. Saba, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-325 and 50-324

Enclosures:

1. Amendment No. 248 to
License No. DPR-71
2. Amendment No. 276 to
License No. DPR-62
3. Safety Evaluation

cc w/enclosures: See next page

July 25, 2008

Mr. Benjamin Waldrep, Vice President
Brunswick Steam Electric Plant
Carolina Power & Light Company
Post Office Box 10429
Southport, North Carolina 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS REGARDING CONTROL ROOM ENVELOPE HABITABILITY IN ACCORDANCE WITH TSTF-448 (TAC NOS. MD6336 AND MD6337)

Dear Mr. Waldrep:

The Commission has issued the enclosed Amendment No. 248 to Renewed Facility Operating License No. DPR-71 and Amendment No. 276 to Facility Operating License No. DPR-62 for Brunswick Steam Electric Plant, Units 1 and 2. The amendments are in response to your application dated July 17, 2007, as supplemented by letters dated February 27 and July 9, 2008. The amendments revise the technical specifications (TS) to adopt TSTF-448, Revision 3, "Control Room Habitability." The amendment also adds a license condition regarding initial performance of new surveillance and assessment requirements. This TS improvement was made available by the U.S. Nuclear Regulatory Commission (Commission) on January 17, 2007 (72 FR 2022) as part of the consolidated line item improvement process.

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

Sincerely,

/RA/

Farideh E. Saba, Senior Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-325 and 50-324

Enclosures:

1. Amendment No. 248 to License No. DPR-71
2. Amendment No. 276 to License No. DPR-62
3. Safety Evaluation

cc w/enclosures: See next page

DISTRIBUTION:

PUBLIC RidsNrrLACSola (Hard Copy) RidsRgn2MailCenter (P. Fredrickson)
LPL2-2 Rdg. RidsOgcRp RidsNrrDorlDpr
RidsNrrDorlLpl2-2 RidsAcrcAcnwMailCenter RidsNrrDssScvb
RidsNrrPMFSaba G. Hill, OIS (4 Hard Copies) BHeida, NRR
Accession Number: ML081750303 Package: ML081750293 TS Pages: ML081750333

OFFICE	LPL2-2/PM	LPL2-2/LA	SCVB/BC*	ITSB/BC	OGC**NOL	LPL-2/BC
NAME	FSaba	CSola	RDennig	RElliott	EWilliamson	BMozafari for TBoyce
DATE	07/21/08	07/21/08	06/03/08	07/24/08	07/25/08	07/25/08

* By memo dated 6/3/2008
and as revised by e-mail dated 7/11/2008

** By e-mail (ML073130139)

OFFICIAL RECORD COPY

Carolina Power & Light Company

Brunswick Steam Electric Plant
Units 1 and 2

cc:

David T. Conley
Associate General Counsel II -
Legal Department
Progress Energy Service Company, LLC
Post Office Box 1551
Raleigh, North Carolina 27602-1551

Ms. Margaret A. Force
Assistant Attorney General
State of North Carolina
Post Office Box 629
Raleigh, North Carolina 27602

Mr. William M. Sue, Chairperson
Brunswick County Board of Commissioners
Post Office Box 249
Bolivia, North Carolina 28422

Mr. Robert P. Gruber
Executive Director
Public Staff - NCUC
4326 Mail Service Center
Raleigh, North Carolina 27699-4326

Resident Inspector
U. S. Nuclear Regulatory Commission
8470 River Road
Southport, North Carolina 28461

Director, Site Operations
Brunswick Steam Electric Plant
Carolina Power & Light Company
Post Office Box 10429
Southport, North Carolina 28461-0429

Mr. John H. O'Neill, Jr.
Pillsbury Winthrop Shaw Pittman, LLP
2300 N Street NW.
Washington, DC 20037-1128

Sandra Spencer, Mayor
City of Southport
201 East Moore Street
Southport, North Carolina 28461

Ms. Beverly Hall, Section Chief
Division of Radiation Protection
N.C. Department of Environment
and Natural Resources
3825 Barrett Dr.
Raleigh, North Carolina 27609-7721

Mr. Warren Lee
Emergency Management Director
New Hanover County Department of
Emergency Management
Post Office Box 1525
Wilmington, North Carolina 28402-1525

Mr. Edward L. Wills, Jr.
Plant General Manager
Brunswick Steam Electric Plant
Carolina Power & Light Company
Post Office Box 10429
Southport, North Carolina 28461-0429

Mr. J. Paul Fulford
Manager, Performance Evaluation and
Regulatory Affairs PEB5
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602-1551

Public Service Commission
State of South Carolina
Post Office Drawer 11649
Columbia, South Carolina 29211

CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 248
Renewed License No. DPR-71

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by Carolina Power & Light Company (the licensee), dated July 17, 2007, as supplemented by letters dated February 27 and July 9, 2008, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-71 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 248, are hereby incorporated in the license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications.

In addition, Section 3, Additional Conditions of Renewed Facility Operating License No. DPR-71 is hereby amended to read as follows:

The Additional Conditions contained in Appendix B, as revised through Amendment No. 248 , are hereby incorporated into this license. Carolina Power & Light Company shall operate the facility in accordance with the Additional Conditions.

3. Appendix B, "Additional Conditions," to Renewed Facility Operating License DPR 71 is amended to add a new license condition, designated as Amendment No. 248 , to read as follows:

Upon implementation of Amendment No. 248 adopting TSTF-448, Revision 3, the determination of control room envelope (CRE) unfiltered air leakage as required by SR 3.7.3.3, in accordance with TS 5.5.13.c.(i), the assessment of CRE habitability as required by Specification 5.5.13.c.(ii), and the measurement of CRE pressure as required by Specification 5.5.13.d, shall be considered met. Following implementation:

- (a) The first performance of SR 3.7.3.3, in accordance with Specification 5.5.13.c.(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 3.0.2, as measured from June 11, 2004, the date of the most recent successful tracer gas test.
 - (b) The first performance of the periodic assessment of CRE habitability, Specification 5.5.13.c.(ii), shall be within the next 9 months.
 - (c) The first performance of the periodic measurement of CRE pressure, Specification 5.5.13.d, shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from the date of the most recent successful pressure measurement test.
4. This license amendment is effective as of the date of its issuance and shall be implemented within 180 days.

FOR THE NUCLEAR REGULATORY COMMISSION

RA B Mozafari for/

Thomas H. Boyce, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachments:
Changes to the Operating License,
Technical Specifications, and
Additional Conditions

Date of Issuance: July 25, 2008

ATTACHMENT TO LICENSE AMENDMENT NO. 248

RENEWED FACILITY OPERATING LICENSE NO. DPR-71

DOCKET NO. 50-325

Replace the following pages of the Renewed Facility Operating License No. DPR-71, the Appendix A Technical Specifications, and Appendix B, Additional Conditions, with the attached revised pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

License Pages

Remove Pages

4
8

Insert Pages

4
8

Appendix A, Technical Specifications

Remove Pages

3.7-11
3.7-12
3.7-13
3.7-14
5.0-17
5.0-17a

Insert Pages

3.7-11
3.7-12
3.7-12
3.7-14
5.0-17
5.0-17a

Appendix B, Additional Conditions

Remove Pages

App. B-1

Insert Pages

App. B-1

CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-324

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 276
Renewed License No. DPR-62

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by Carolina Power & Light Company (the licensee), dated July 17, 2007, as supplemented by letters dated February 27 and July 9, 2008, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-62 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 276, are hereby incorporated in the license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications.

In addition, Section 3, Additional Conditions of Renewed Facility Operating License No. DPR-62 is hereby amended to read as follows:

The Additional Conditions contained in Appendix B, as revised through Amendment No. 276 , are hereby incorporated into this license. Carolina Power & Light Company shall operate the facility in accordance with the Additional Conditions.

3. Appendix B, "Additional Conditions," to Renewed Facility Operating License DPR 62 is amended to add a new license condition, designated as Amendment No. 276 , to read as follows:

Upon implementation of Amendment No. 276 adopting TSTF-448, Revision 3, the determination of control room envelope (CRE) unfiltered air leakage as required by SR 3.7.3.3, in accordance with TS 5.5.13.c.(i), the assessment of CRE habitability as required by Specification 5.5.13.c.(ii), and the measurement of CRE pressure as required by Specification 5.5.13.d, shall be considered met. Following implementation:

- (a) The first performance of SR 3.7.3.3, in accordance with Specification 5.5.13.c.(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 3.0.2, as measured from June 11, 2004, the date of the most recent successful tracer gas test.
 - (b) The first performance of the periodic assessment of CRE habitability, Specification 5.5.13.c.(ii), shall be within the next 9 months.
 - (c) The first performance of the periodic measurement of CRE pressure, Specification 5.5.13.d, shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from the date of the most recent successful pressure measurement test.
4. This license amendment is effective as of the date of its issuance and shall be implemented within 180 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA B Mozafari for/

Thomas H. Boyce, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachments:
Changes to the Operating License,
Technical Specifications, and
Additional Conditions

Date of Issuance: July 25, 2008

ATTACHMENT TO LICENSE AMENDMENT NO. 276

FACILITY OPERATING LICENSE NO. DPR-62

DOCKET NO. 50-324

Replace the following pages of the Renewed Facility Operating License No. DPR-62, the Appendix A Technical Specifications, and Appendix B, Additional Conditions, with the attached revised pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

License Pages

Remove Pages

3
8

Insert Pages

3
8

Appendix A, Technical Specifications

Remove Pages

3.7-11
3.7-12
3.7-13
3.7-14
5.0-17
5.0-17a

Insert Pages

3.7-11
3.7-12
3.7-12
3.7-14
5.0-17
5.0-17a

Appendix B, Additional Conditions

Remove Pages

App. B-1

Insert Pages

App. B-1
App. B-2

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 248 AND 276

TO RENEWED FACILITY OPERATING LICENSES NOS. DPR-71 AND DPR-62

CAROLINA POWER & LIGHT COMPANY

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2

DOCKET NOS. 50-325 AND 50-324

1.0 INTRODUCTION

By letter dated July 17, 2007, as supplemented by letters dated February 27 and July 9, 2008, the Carolina Power & Light Company (the licensee) requested amendments to Renewed Operating Licenses DPR-71 and DPR-62 for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2, respectively. The proposed amendments would revise the BSEP, Units 1 and 2 technical specifications (TS) to adopt the Nuclear Regulatory Commission (NRC, Commission)-approved industry Technical Specifications Task Force (TSTF) standard TS (STS) change traveler, TSTF-448, Revision 3, "Control Room Habitability." This TS change was made available by the NRC on January 17, 2007 (72 FR 2022), as part of the consolidated line item improvement process. The amendments would modify TS requirements regarding control room envelope (CRE) habitability in TS 3.7.3, "Control Room Emergency Ventilation (CREV) System," and TS Section 5.5, "Programs and Manuals."

In NRC Generic Letter (GL) 2003-01, "Control Room Habitability," dated June 12, 2003, licensees were alerted to findings at facilities that existing TS surveillance requirements (SRs) for the control room emergency ventilation (CREV) system may not be adequate. Specifically, the results of American Society of Testing and Materials (ASTM) E741, "Standard Test Method for Determining Air Change in a Single Zone by Means of a Tracer Gas Dilution," 2000, tracer gas tests to measure CRE unfiltered inleakage at facilities indicated that the differential pressure surveillance is not a reliable method for demonstrating CRE boundary operability. Licensees were requested to address existing TS as follows:

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 generic letter, the industry and the NRC proposed revisions to CRE habitability system requirements contained in the STS, using the STS change traveler process. On August 8, 2006, the commercial nuclear electrical power generation industry owners group TSTF submitted a proposed change, TSTF-448, Revision 3, to the improved STS (NUREGs [NRC technical report designation] 1430-1434) on behalf of the industry (TSTF-448, Revisions 0, 1, and 2 were prior draft iterations). TSTF-448, Revision 3, is a proposal to establish more effective and appropriate action, surveillance, and administrative STS requirements related to ensuring the habitability of the CRE. The NRC approved TSTF-448, Revision 3 on January 17, 2007.

Consistent with the intent of the traveler as incorporated into NUREG-1433, "Standard Technical Specifications General Electric Plants, BWR/4," the licensee proposed revising action and SRs in TS 3.7.3, and adding a new administrative controls program, TS 5.5.13, "Control Room Envelope Habitability Program." The purpose of the changes is 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.

Some editorial and plant-specific changes were incorporated into this safety evaluation resulting in minor deviations from the model safety evaluation text in TSTF-448, Revision 3.

The supplements dated February 27 and July 9, 2008, 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* on May 20, 2008 (73 FR 29161)

2.0 REGULATORY EVALUATION

2.1 Control Room and Control Room Envelope

NRC Regulatory Guide (RG) 1.196, "Control Room Habitability at Light-Water Nuclear Power Reactors," Revision 0, May 2003, 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 that 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, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, also contains these definitions, but uses the term CRE to mean both. This is because the protected environment provided for operators varies with the nuclear power facility. At some facilities this environment is limited to the control room; at others, it is the CRE. In this safety evaluation, consistent with the proposed changes to the STS, the CRE will be used to designate both. For consistency, facilities should use the term CRE with an appropriate facility-specific definition derived from the above CRE definition.

2.2 Control Room Emergency Ventilation System

The CREV System (the term used at BSEP, Units 1 and Unit 2 for the Control Room Envelope Emergency Ventilation System, CREEVS), provides 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, under both normal and accident conditions.

The CREV System is designed to maintain a habitable environment in the CRE for 30 days of continuous occupancy after a design basis accident (DBA) without exceeding a 5 roentgen equivalent man (rem) total effective dose equivalent (TEDE).

The CREV System consists of two redundant subsystems, each capable of maintaining the habitability of the CRE. The CREV System is considered operable when the individual components necessary to limit operator exposure are operable in both subsystems. A CREV subsystem is considered operable when the associated:

- Emergency recirculation fan is OPERABLE;
- High efficiency particulate air filters and charcoal adsorber bank are not excessively restricting flow, and are capable of performing their filtration functions;
- Ductwork, valves, and dampers are operable, and air circulation can be maintained;
- Two control supply fans must be OPERABLE; and
- CRE boundary is OPERABLE (the single boundary supports both subsystems).

The CRE boundary is considered operable when the measured unfiltered air leakage is less than or equal to the leakage value assumed by the licensing basis analyses of DBA consequences to CRE occupants.

2.3 Regulations Applicable to Control Room Habitability

In Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, "Domestic Licensing of Production and Utilization Facilities," General Design Criteria (GDC) 1, 2, 3, 4, 5, and 19 apply to CRE habitability. A summary of these GDCs follows. The BSEP design was reviewed for construction under the "General Design Criteria for Nuclear Power Plant Construction," issued for comment by the Atomic Energy Commission in July 1967, and is committed to meet the intent of the GDC, published in the *Federal Register* on May 21, 1971, as Appendix A to 10 CFR, Part 50.

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 earthquakes and other natural hazards.

GDC 3, "Fire Protection," requires SSCs important to safety be designed and located to minimize 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 loss-of-coolant accidents (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 reactor 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.

Prior to incorporation of TSTF-448, Revision 3, the STS requirements addressing CRE boundary operability resided only in the following CRE ventilation system specifications:

- NUREG-1430, TS 3.7.10, "Control Room Emergency Ventilation System (CREVS);"
- NUREG-1431, TS 3.7.10, "Control Room Emergency Filtration System (CREFS);"
- NUREG-1432, TS 3.7.11, "Control Room Emergency Air Cleanup System (CREACS);"
- NUREG-1433, TS 3.7.4, "[Main Control Room Environmental Control (MCREC) System;" and
- NUREG-1434, TS 3.7.3, "[Control Room Fresh Air (CRFA)] System."

In these specifications, the SR associated with demonstrating the operability of the CRE boundary requires verifying that one CREV subsystem 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 CREV 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, 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 GDC-19, even while crediting compensatory measures.

NRC Administrative Letter (AL) 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety," states that "the discovery of an improper or inadequate TS value or required action is considered a degraded or nonconforming condition as defined in GL 91-18." The NRC Inspection Manual Chapter 9900 Technical Guidance, "Operability Determinations & Functionality Assessments for Resolution of Degraded and Nonconforming Conditions Adverse to Quality or Safety (OD Process)," is issued as the attachment to Regulatory Information Summary (RIS) 2005-20, "Revision to Guidance Formerly Contained in NRC Generic Letter 91-18, *Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability.*" The NRC staff expects that following the imposition of administrative controls, and with appropriate justification and schedule, an amendment to the inadequate TS 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 reanalysis, have implemented compensatory actions to ensure the safety of CRE occupants, pending final resolution of the condition consistent with RIS 2005-20. 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(d)(3), which requires a facility's TS to include SRs, which it defines as "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 limiting conditions for operation will be met.*" (Emphasis added.)

The NRC staff also expects facilities to propose unambiguous remedial actions, consistent with 10 CFR 50.36(d)(2), for the condition of not meeting the limiting condition for operation (LCO) due to 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.

2.4 Adoption of TSTF-448, Revision 3, by Brunswick Steam Electric Plant Units 1 and Unit 2

Adoption of TSTF-448, Revision 3, will assure that the facility's TS LCO for the CREV is met by demonstrating unfiltered leakage into the CRE is within limits; i.e., the operability of the CRE boundary. In support of this surveillance, which specifies a test interval (frequency) described in RG 1.197, TSTF-448 also adds TS administrative controls to assure the habitability of the CRE between performances of the ASTM E741 test. In addition, adoption of TSTF-448 will establish clearly stated and reasonable required actions in the event CRE unfiltered inleakage is found to exceed the analysis assumption.

The changes made by TSTF-448 to the STS requirements for the CREV and the CRE boundary conform to 10 CFR 50.36(d)(2) and 10 CFR 50.36(d)(3). Their adoption will better assure that the BSEP, Units 1 and Unit 2 CRE will remain habitable during normal operation and DBA conditions. These changes are, therefore, acceptable from a regulatory standpoint.

3.0 TECHNICAL EVALUATION

The NRC staff reviewed the proposed changes against the corresponding changes made to the STS by TSTF-448, Revision 3, which the NRC staff has found to satisfy applicable regulatory requirements, as described above in Section 2.0. The emergency operational mode of the CREV at BSEP, Units 1 and Unit 2 pressurizes the CRE to minimize unfiltered air inleakage. The proposed changes are consistent with this design.

3.1 Proposed Changes

The proposed amendment would strengthen CRE habitability TS requirements by changing TS 3.7.3 and adding a new TS administrative controls program on CRE habitability. Accompanying the proposed TS changes are appropriate conforming technical changes to the TS Bases. The proposed revision to the TS Bases also includes editorial and administrative changes to reflect applicable changes to the corresponding STS Bases, which were made to improve clarity, conform to the latest information and references, correct factual errors, and achieve more consistency among the STS NUREGs. Except for plant-specific differences, all of these changes are consistent with STS as revised by TSTF-448, Revision 3, or are consistent with existing licensing basis.

The NRC staff compared the proposed TS changes to the STS and the STS markups and evaluations in TSTF-448. The staff verified that differences from the STS were adequately justified on the basis of plant-specific design or retention of current licensing basis. The NRC staff also reviewed the proposed changes to the TS Bases for consistency with the STS Bases and the plant-specific design and licensing bases, although approval of the Bases is not a condition for accepting the proposed amendment. However, TS 5.5.10, "TS Bases Control Program," provides assurance that the licensee has established and will maintain the adequacy of the Bases. The proposed Bases for TS 3.7.3 refer to specific guidance in Nuclear Energy Institute (NEI) 99-03, "Control Room Habitability Assessment Guidance," Revision 0, dated June 2001, which the NRC staff has formally endorsed, with exceptions, through RG 1.196.

3.2 Editorial Changes

The licensee proposed editorial changes to TS 3.7.3 to establish standard terminology, such as "control room envelope (CRE)" in place of "control room," except for the plant-specific name for

the CREV System (plant-specific name for CREEVS). These changes improve the usability and quality of the presentation of the TS, have no impact on safety, and therefore, are acceptable.

3.3 TS 3.7.3, Control Room Emergency Ventilation (CREV) System

The licensee proposed to establish new action requirements in TS 3.7.3 for an inoperable CRE boundary. Currently, if one CREVS subsystem is determined to be inoperable due to an inoperable CRE boundary, existing Action A would apply and require restoring the subsystem (and the CRE boundary) to operable status in 7 days. If two subsystems are determined to be inoperable due to an inoperable CRE boundary, existing Action B specifies to be in MODE 3 in 12 hours and MODE 4 in 36 hours. These existing Actions are more restrictive than would be appropriate 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 such situations, the licensee proposed to revise the action requirements to add a new Condition B, "One or more CREV subsystems inoperable due to inoperable CRE boundary in MODE 1, 2, or 3." New Action B would allow 90 days to restore the CRE boundary (and consequently, the affected CREV subsystem) to operable status, provided that mitigating actions are immediately implemented and within 24 hours are verified to ensure, 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 24-hour Completion Time of new Required Action B.2 is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90-day Completion Time is reasonable based on the determination that 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 new Required Action B.3 is a reasonable time to diagnose, plan and possibly repair, and test most anticipated problems with the CRE boundary. Therefore, proposed Actions B.1, B.2, and B.3 are acceptable.

To distinguish new Condition B from the existing condition for one CREV subsystem inoperable, Condition A is revised to state, "One CREV subsystem inoperable for reasons other than Condition B." To distinguish new Condition B from the existing condition for two CREV systems inoperable, Condition B (renumbered as Condition C) is revised to state, "Two CREV subsystems inoperable during MODE 1, 2, or 3 for reasons other than Condition B." Existing Condition B differs from the equivalent condition in NUREG-1433, revision 3.1 (STS) in that STS 3.7.4. "[Main Control Room Environmental Control (MCREC)] System", Condition E has a REQUIRED ACTION to immediately enter LCO 3.0.3 and the BSEP TS has less restrictive REQUIRED ACTION. This is acceptable since less restrictive action was approved in Amendment No. 203 for Unit 1 and in Amendment No. 233 for Unit 2 and is part of the current licensing basis. The changes to existing Conditions A and B are less restrictive because these Conditions will no longer apply in the event one or two CREV subsystems are inoperable due to an inoperable CRE boundary during unit operation in Mode 1, 2, or 3. This is acceptable because the new Action B establishes adequate remedial measures in this condition. With the addition of a new Condition B, existing Conditions B, C, and D are redesignated C, D, and E, respectively.

The licensee also proposed to modify the CREV LCO by adding a NOTE allowing the CRE boundary to be opened intermittently under administrative controls. As stated in the LCO Bases, 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 allowance of this NOTE is acceptable because the administrative controls will ensure that the opening will be quickly sealed to maintain the validity of the licensing basis analyses of DBA consequences.

The licensee proposed to add a new condition to Action E of TS 3.7.3 that states, "One or more CREV subsystems inoperable due to an inoperable CRE boundary during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS or during OPDRVs." (OPDRVs are operations with a potential for draining the reactor vessel). The specified Required Actions proposed for this condition are the same as for the other existing condition for Action E, which states, "Two CREVS subsystems inoperable during movement of irradiated fuel assemblies in the secondary containment, during CORE ALTERATIONS, or during OPDRVs." Accordingly, the new condition is stated with the other condition in Action E using the logical connector "OR". The practical result of this presentation in format is the same as specifying two separately numbered Actions, one for each condition. Its advantage is to make the TS Actions table easier to use by avoiding having an additional numbered row in the Actions table. This new condition in Action E is needed because proposed Action B will only apply in Modes 1, 2, and 3. As such, this change will ensure that the Actions table continues to specify a condition for an inoperable CRE boundary during refueling and OPDRVs. Therefore, this change is administrative and acceptable.

In the emergency radiation state of operation, the CREV isolates unfiltered ventilation air supply intakes, filters the emergency ventilation air supply to the CRE, and pressurizes the CRE to minimize unfiltered air leakage past the CRE boundary. The licensee proposed to delete the CRE pressurization SR. This SR requires verifying that one CREVS subsystem, operating in the emergency radiation state, can maintain a positive pressure, relative to the outside atmosphere during the pressurization mode of operation at a makeup flow rate of ≤ 2200 cubic feet per minute. The deletion of this SR is proposed because measurements of unfiltered air leakage into the CRE at numerous reactor facilities demonstrated that a basic assumption of this SR, an essentially leak-tight CRE boundary, was incorrect for most facilities. Hence, meeting this SR by achieving the required CRE pressure is not necessarily a conclusive indication of CRE boundary leak tightness, i.e., CRE boundary operability. In its response to GL 2003-01, dated December 9, 2003, the licensee proposed to replace the CRE pressurization surveillance, SR 3.7.3.3 with an inleakage measurement SR and a CRE Habitability Program in TS Section 5.5, in accordance with the approved version of TSTF-448. Based on the adoption of TSTF-448, Revision 3, the licensee's proposal to replace SR 3.7.3.3 is acceptable.

The proposed CRE inleakage measurement SR states, "Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program." The Control Room Envelope Habitability Program TS, proposed TS 5.5.13, requires that the program include "Requirements for 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 RG 1.197, Revision 0. This guidance references ASTM E741 as an acceptable method for ascertaining the unfiltered leakage into the CRE. The licensee has proposed to follow this method. Therefore, the proposed CRE inleakage measurement SR is acceptable.

3.4 TS 5.5.13, Control Room Envelope Habitability Program

The proposed administrative controls program TS is consistent with the model program TS in TSTF-448, Revision 3. In combination with SR 3.7.3.3, this program is intended to ensure the operability of the CRE boundary, which as part of an operable CREV 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 shall ensure that adequate radiation protection is provided to permit access and occupancy of the CRE under DBA conditions without personnel receiving radiation exposures in excess of 5 rem TEDE for the duration of the accident.

The licensee proposed to omit the words "access and" from the TSTF-448 model (Section 5.5.15 in the BWR/4 STS) lead-in paragraph. The licensee justifies this change by indicating that the CRE boundary and the programs to maintain it are only providing the necessary protection for the occupancy of the control room. The program is independent of the ability to access the control room. The staff finds this acceptable because the omitted words do not impact the program requirements.

A CRE Habitability Program TS acceptable to the NRC staff requires the program to contain the following elements:

- a. Definitions of CRE and CRE boundary: This element is intended to ensure that these definitions accurately describe the plant areas that are within the CRE, and also 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.
- b. Configuration control and preventive maintenance of the CRE boundary: This element is intended to ensure the CRE boundary is maintained in its design condition. Guidance for implementing this element is contained in RG 1.196, which endorsed, with exceptions, NEI 99-03. Maintaining the CRE boundary in its design condition provides assurance that its leak-tightness will not significantly degrade between CRE inleakage determinations.
- c. 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. Assessing CRE habitability at the 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 test methods acceptable to the NRC staff 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 leakage determinations.

- d. Measurement, at designated locations, of the CRE pressure relative to external areas adjacent to the CRE boundary during the pressurization mode of operation by one subsystem of the CREV System, operating at the flow rate required by the Ventilation Filter Test Program, at a frequency of 18 months on a STAGGERED TEST BASIS (with respect to the CREV subsystems). This element is intended to ensure 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 leakage determinations.

The results of the CRE pressurization test will be trended and used as part of the assessment of the CRE boundary. In response to a request for additional information regarding the frequency of the assessment, the licensee removed the term "[] month" from the TSTF-448 model wording. On the basis that the assessment will be done according to the timing indicated in TS 5.5.13, paragraph "c" which commits to RG 1.197, Figure 1, the NRC staff finds this acceptable.

- e. Quantitative limits on unfiltered leakage. This element is intended to establish the CRE leakage 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 3.7.3, will ensure that associated action requirements will be consistently applied in the event of CRE degradation resulting in leakage exceeding the limit.
- f. Consistent with TSTF-448, Revision 3, the program states that the provisions of SR 3.0.2 are applicable to the program frequencies for performing the activities required by program paragraph number c, parts (i) and (ii) (assessment of CRE habitability and measurement of CRE leakage), and paragraph number d (measurement of CRE differential pressure). This statement is needed to avoid confusion. 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 unless specifically invoked. Providing this statement in the program eliminates any confusion regarding whether SR 3.0.2 is applicable, and is acceptable.

Consistent with TSTF-448, Revision 3, proposed TS 5.5.13 states that (1) a CRE Habitability Program shall be established and implemented, (2) the program shall include all of the NRC-required elements, as described above, and (3) the provisions of SR 3.0.2 shall apply to program frequencies. Therefore, TS 5.5.13, which is consistent with the model program TS approved by the NRC in TSTF-448, Revision 3, is acceptable.

3.5 Implementation of New Surveillance and Assessment Requirements by the Licensee

The licensee has proposed license conditions regarding the initial performance of the new surveillance and assessment requirements. The new license conditions adopted the conditions in section 2.3 of the model application published in the *Federal Register* on January 17, 2007 (72 FR 2022). Plant-specific changes were made to these proposed license conditions. The proposed plant-specific license conditions are consistent with the model application, and are acceptable.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR, Part 20 and change the SRs. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (73 FR 29161). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and (10). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) 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.

Principal Contributors: Bruce Heida

Date: July 25, 2008