

June 2, 1998

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

SUBJECT: ISSUANCE OF AMENDMENT NO. 201 TO FACILITY OPERATING LICENSE NO. DPR-71 AND AMENDMENT NO. 231 TO FACILITY OPERATING LICENSE NO. DPR-62 REVISING THE SURVEILLANCE REQUIREMENTS FOR TESTING OF THE CONTROL ROOM EMERGENCY VENTILATION SYSTEM CHARCOAL ADSORBER - BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 (TAC NOS. M99232 AND M99233)

Dear Mr. Hinnant:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 201 to Facility Operating License No. DPR-71 and Amendment No. 231 to Facility Operating License No. DPR-62 for Brunswick Steam Electric Plant, Units 1 and 2. The amendments consist of changes to the Technical Specifications (TS) in response to your application dated April 30, 1997, as supplemented by your letters dated October 28, 1997, and May 15, 1998.

The amendments revise surveillance requirements 4.7.2.b.2 and 4.7.2.c to require testing of the control room emergency ventilation system charcoal adsorber in accordance with the American Society for Testing and Material D3803-1989, "Standard Test Method for Nuclear-Grade Activated Carbon."

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's bi-weekly Federal Register Notice.

Sincerely,

Original signed by:

David C. Trimble, Project Manager
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-325
and 50-324

Enclosures:

1. Amendment No. 201 to License No. DPR-71
2. Amendment No. 231 to License No. DPR-62
3. Safety Evaluation

cc w/enclosures: See next page

FILENAME - G:\BRUNSWIC\BR99232.AMD

PM:PDII-1	LA:PDII-1	OGC	APD:PDII-1	
DTrimble	EDunnington	MZOBLA	PTKuo	
5/29/98	5/20/98	5/27/98	6/12/98	
Yes/No	Yes/No	Yes/No	Yes/No	

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A to noted changes

NRC FILE CONTROL ROOM

AMENDMENT NO. 201 TO FACILITY OPERATING LICENSE NO. DPR-71 - BRUNSWICK,
UNIT 1 AND AMENDMENT NO. 231 TO FACILITY OPERATING LICENSE NO. DPR-62 -
BRUNSWICK, UNIT 2

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

CAROLINA POWER & LIGHT COMPANY, et al.

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 201
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 April 30, 1997, as supplemented by letters dated October 28, 1997, and May 15, 1998, 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 Facility Operating License No. DPR-71 is hereby amended to read as follows:

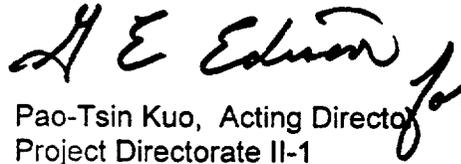
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(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 201 , are hereby incorporated in the license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Pao-Tsin Kuo, Acting Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 2, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 201

FACILITY OPERATING LICENSE NO. DPR-71

DOCKET NO. 50-325

Replace the following page of the Appendix A Technical Specifications with the enclosed page.
The revised area is indicated by a marginal line.

Remove Page

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Insert Page

3/4 7-4
B 3/4 7-1h
B 3/4 7-1i

PLANT SYSTEMS

3/4.7.2 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, and tested in accordance with the methodology provided by ASTM D3803-1989, at a temperature of 30°C* and a relative humidity of 95%*, meets the acceptance criteria of < 5.0% penetration of methyl iodide.
3. Verifying a system flow rate of 2000 cfm \pm 10% during system operation when tested in accordance with ANSI N510-1975.
- c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, and tested in accordance with the methodology provided by ASTM D3803-1989, at a temperature of 30°C* and a relative humidity of 95%*, meets the acceptance criteria of < 5.0% penetration of methyl iodide.
- d. At least once per 18 months by:
 1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is \leq 5.25 inches Water Gauge while operating the filter train at a flow rate of 2000 cfm \pm 10%.
 2. Verifying that on a smoke detector or control room ventilation system high radiation test signal, the control building ventilation system automatically diverts its inlet flow through the HEPA filters and charcoal adsorber banks of the emergency filtration system.
 3. Verifying that on a chlorine detector test signal, the control building ventilation system automatically isolates and the control room emergency filtration system cannot be started by a smoke detector or control room ventilation system high radiation test signal.
 4. Verifying that the system maintains the control room at a positive pressure relative to the outside atmosphere during system operation.

*Laboratory testing within the temperature and humidity tolerances provided in Table 1 of ASTM D3803-1989 constitutes compliance with Surveillance Requirements 4.7.2.b.2 and 4.7.2.c.

PLANT SYSTEMS

BASES

3/4.7.2 CONTROL ROOM EMERGENCY VENTILATION SYSTEM (Continued)

Surveillance Requirements

The SURVEILLANCE REQUIREMENTS (SR) in this specification verify that a subsystem in the standby mode starts on demand and continues to operate. Standby systems are checked periodically to ensure that the automatic start function is consistent with the assumptions in the Control Room Habitability Analyses (References 4 and 6). Since the environmental conditions on this system are not severe, monthly demonstration of the capability of the system to operate by SR 4.7.2.a is considered adequate. The ≥ 15 minute run time is considered adequate for operation of systems without heaters (Reference 16).

SR 4.7.2.b verifies the capability of the filtration system at least once every 18 months, or 1) following any structural maintenance on the filtration unit HEPA filter or charcoal adsorbers or 2) following painting, fire, or chemical release in any ventilation zone communicating with the system. Field testing is performed in accordance with applicable sections of Regulatory Guide 1.52, Revision 1, and ANSI N510-1975. The use of Regulatory Guide 1.52, Revision 1 and ANSI N510-1975 is consistent with the guidance provided in Generic Letter 83-13 (Reference 7). Charcoal samples for laboratory testing are obtained per the applicable sections of Regulatory Guide 1.52, Revision 1. The laboratory testing is performed in accordance with the methodology in ASTM D3803-1989 (Reference 17). ASTM D3803-1989 is a more current testing standard which was developed after the Generic Letter 83-13. It contains criteria for use with charcoal beds with no humidity control, this is consistent with the design of the CREV system. The acceptance criteria used for the laboratory test is $< 5.0\%$ penetration of methyl iodide (Reference 18). This corresponds to a 90% filtration efficiency which is the filtration efficiency assumed in the bounding calculations of control room doses. As such, the acceptance criteria of $< 5.0\%$ penetration of methyl iodide ensures that General Design Criterion 19 dose limits for control room operators are not exceeded.

SR 4.7.2.c verifies adequacy of the charcoal filtration system following every 720 hours of operation. The time of operation is based on the recommendations of Regulatory Guide 1.52, Revision 1 (Reference 8), and early nuclear plant filter testing (Reference 10).

SR 4.7.2.d demonstrates functional capability of the system by verifying 1) pressure drop across the HEPA and charcoal filtration units, 2) automatic emergency system initiation upon receipt of a smoke detector or high radiation test signal, 3) the override function of the chlorine protection function, and 4) ability of the system to maintain a positive pressure relative to the outside atmosphere during system operation. The maximum pressure drop of < 5.25 inches water gauge is based on a CREVS pressure drop analysis (Reference 9) and fan capability. This maximum pressure drop ensures the system is capable of delivering rated flow with 1 inch water gauge margin for filter loading. The positive pressure test is performed to ensure that the control room is maintained positive to any potentially contaminated external atmosphere, including the outside atmosphere and adjacent building atmosphere(s). Testing of the chlorine override function ensures operability of the chlorine protection mode of the CREVS by demonstrating the capability of the system to prevent the emergency filtration units from initiating during a chlorine event.

SR 4.7.2.e and SR 4.7.2.f verify that the filtration capability of the HEPA and charcoal adsorber banks is consistent with that assumed in the Control Room Habitability Analyses (References 4 and 6) following partial or complete replacement of either filtration component. The testing is performed in accordance with the applicable sections of ANSI N510-1975 (Reference 14).

PLANT SYSTEMS

BASES

3/4.7.2 CONTROL ROOM EMERGENCY VENTILATION SYSTEM (Continued)

References

1. 10 CFR 50, Appendix A, General Design Criterion 19, Control Room.
2. Regulatory Guide 1.95, Revision 1, Protection of Nuclear Power Plant Control Room Operators Against an Accidental Chemical Release.
3. Updated FSAR, Brunswick Steam Electric Plant, Units 1 & 2.
4. NUS-3697, Revision 2, February 1983, Control Room Habitability Analysis.
5. NLU-83-673, TMI Action Item III.D.3.4 - Control Room Habitability, NRC Safety Evaluation dated October 18, 1983.
6. NUS-4758, Control Room Radiological Reanalysis, August, 1985.
7. Generic Letter 83-13, Clarification of Surveillance Requirements for HEPA Filters and Charcoal Adsorber Units in Standard Technical Specifications of ESF Cleanup Systems, March 2, 1983.
8. Regulatory Guide 1.52, Revision 1, July 1976.
9. CP&L Calculation G0077A-01, Control Room Emergency Filter System Differential Pressure Analysis.
10. Original FSAR, BSEP, Units 1 and 2, Appendix K.
11. IEEE 279-1971, IEEE Criteria for Protection Systems for Nuclear Power Generating Stations.
12. DBD-37, Design Basis Document for Control Building Heating, Ventilation, and Air Conditioning System.
13. NRC-89-103, NRC Safety Evaluation for Control Room Habitability, February 16, 1989.
14. ANSI N510-1975, Testing of Nuclear Air Cleaning Systems.
15. ANSI N509-1976, Nuclear Power Plant Air Cleaning Units.
16. NUREG-1433, Standard Technical Specifications, General Electric Plants, BWR/4, Revision 0, September 28, 1992.
17. ASTM D3803-1989 (Reapproved 1995), Standard Test Method for Nuclear-Grade Activated Carbon.
18. ESR 97-00078 Revision 1, Charcoal Testing for CBEAF per ASTM D3803-1989.



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

CAROLINA POWER & LIGHT COMPANY, et al.

DOCKET NO. 50-324

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 231
License No. DPR-62

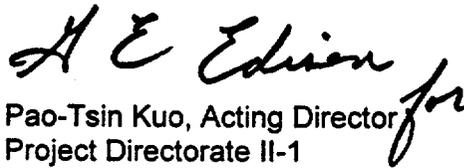
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by Carolina Power & Light Company (the licensee), dated April 30, 1997, as supplemented by letters dated October 28, 1997, and May 15, 1998, complies with the standards and requirements of 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 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. 231 , are hereby incorporated in the license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink that reads "A E Edison for". The signature is written in a cursive style.

Pao-Tsin Kuo, Acting Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: June 2, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 231

FACILITY OPERATING LICENSE NO. DPR-62

DOCKET NO. 50-324

Replace the following page of Appendix A Technical Specifications with the enclosed page.
The revised area is indicated by a marginal line.

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PLANT SYSTEMS

3/4.7.2 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, and tested in accordance with the methodology provided by ASTM D3803-1989, at a temperature of 30°C* and a relative humidity of 95%*, meets the acceptance criteria of < 5.0% penetration of methyl iodide.
3. Verifying a system flow rate of 2000 cfm \pm 10% during system operation when tested in accordance with ANSI N510-1975.
- c. After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, and tested in accordance with the methodology provided by ASTM D3803-1989, at a temperature of 30°C* and a relative humidity of 95%*, meets the acceptance criteria of < 5.0% penetration of methyl iodide.
- d. At least once per 18 months by:
 1. Verifying that the pressure drop across the combined HEPA filters and charcoal adsorber banks is \leq 5.25 inches Water Gauge while operating the filter train at a flow rate of 2000 cfm \pm 10%.
 2. Verifying that on a smoke detector or control room ventilation system high radiation test signal, the control building ventilation system automatically diverts its inlet flow through the HEPA filters and charcoal adsorber banks of the emergency filtration system.
 3. Verifying that on a chlorine detector test signal, the control building ventilation system automatically isolates and the control room emergency filtration system cannot be started by a smoke detector or control room ventilation system high radiation test signal.
 4. Verifying that the system maintains the control room at a positive pressure relative to the outside atmosphere during system operation.

*Laboratory testing within the temperature and humidity tolerances provided in Table 1 of ASTM D3803-1989 constitutes compliance with Surveillance Requirements 4.7.2.b.2 and 4.7.2.c.

PLANT SYSTEMS

BASES

3/4.7.2 CONTROL ROOM EMERGENCY VENTILATION SYSTEM (Continued)

Surveillance Requirements

The SURVEILLANCE REQUIREMENTS (SR) in this specification verify that a subsystem in the standby mode starts on demand and continues to operate. Standby systems are checked periodically to ensure that the automatic start function is consistent with the assumptions in the Control Room Habitability Analyses (References 4 and 6). Since the environmental conditions on this system are not severe, monthly demonstration of the capability of the system to operate by SR 4.7.2.a is considered adequate. The ≥ 15 minute run time is considered adequate for operation of systems without heaters (Reference 16).

SR 4.7.2.b verifies the capability of the filtration system at least once every 18 months, or 1) following any structural maintenance on the filtration unit HEPA filter or charcoal adsorbers or 2) following painting, fire, or chemical release in any ventilation zone communicating with the system. Field testing is performed in accordance with applicable sections of Regulatory Guide 1.52, Revision 1, and ANSI N510-1975. The use of Regulatory Guide 1.52, Revision 1 and ANSI N510-1975 is consistent with the guidance provided in Generic Letter 83-13 (Reference 7). Charcoal samples for laboratory testing are obtained per the applicable sections of Regulatory Guide 1.52, Revision 1. The laboratory testing is performed in accordance with the methodology in ASTM D3803-1989 (Reference 17). ASTM D3803-1989 is a more current testing standard which was developed after the Generic Letter 83-13. It contains criteria for use with charcoal beds with no humidity control, this is consistent with the design of the CREV system. The acceptance criteria used for the laboratory test is $< 5.0\%$ penetration of methyl iodide (Reference 18). This corresponds to a 90% filtration efficiency which is the filtration efficiency assumed in the bounding calculations of control room doses. As such, the acceptance criteria of $< 5.0\%$ penetration of methyl iodide ensures that General Design Criterion 19 dose limits for control room operators are not exceeded.

SR 4.7.2.c verifies adequacy of the charcoal filtration system following every 720 hours of operation. The time of operation is based on the recommendations of Regulatory Guide 1.52, Revision 1 (Reference 8), and early nuclear plant filter testing (Reference 10).

SR 4.7.2.d demonstrates functional capability of the system by verifying 1) pressure drop across the HEPA and charcoal filtration units, 2) automatic emergency system initiation upon receipt of a smoke detector or high radiation test signal, 3) the override function of the chlorine protection function, and 4) ability of the system to maintain a positive pressure relative to the outside atmosphere during system operation. The maximum pressure drop of < 5.25 inches water gauge is based on a CREVS pressure drop analysis (Reference 9) and fan capability. This maximum pressure drop ensures the system is capable of delivering rated flow with 1 inch water gauge margin for filter loading. The positive pressure test is performed to ensure that the control room is maintained positive to any potentially contaminated external atmosphere, including the outside atmosphere and adjacent building atmosphere(s). Testing of the chlorine override function ensures operability of the chlorine protection mode of the CREVS by demonstrating the capability of the system to prevent the emergency filtration units from initiating during a chlorine event.

SR 4.7.2.e and SR 4.7.2.f verify that the filtration capability of the HEPA and charcoal adsorber banks is consistent with that assumed in the Control Room Habitability Analyses (References 4 and 6) following partial or complete replacement of either filtration component. The testing is performed in accordance with the applicable sections of ANSI N510-1975 (Reference 14).

PLANT SYSTEMS

BASES

3/4.7.2 CONTROL ROOM EMERGENCY VENTILATION SYSTEM (Continued)

References

1. 10 CFR 50, Appendix A, General Design Criterion 19, Control Room.
2. Regulatory Guide 1.95, Revision 1, Protection of Nuclear Power Plant Control Room Operators Against an Accidental Chemical Release.
3. Updated FSAR, Brunswick Steam Electric Plant, Units 1 & 2.
4. NUS-3697, Revision 2, February 1983, Control Room Habitability Analysis.
5. NLU-83-673, TMI Action Item III.D.3.4 - Control Room Habitability, NRC Safety Evaluation dated October 18, 1983.
6. NUS-4758, Control Room Radiological Reanalysis, August, 1985.
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9. CP&L Calculation G0077A-01, Control Room Emergency Filter System Differential Pressure Analysis.
10. Original FSAR, BSEP, Units 1 and 2, Appendix K.
11. IEEE 279-1971, IEEE Criteria for Protection Systems for Nuclear Power Generating Stations.
12. DBD-37, Design Basis Document for Control Building Heating, Ventilation, and Air Conditioning System.
13. NRC-89-103, NRC Safety Evaluation for Control Room Habitability, February 16, 1989.
14. ANSI N510-1975, Testing of Nuclear Air Cleaning Systems.
15. ANSI N509-1976, Nuclear Power Plant Air Cleaning Units.
16. NUREG-1433, Standard Technical Specifications, General Electric Plants, BWR/4, Revision 0, September 28, 1992.
17. ASTM D3803-1989 (Reapproved 1995), Standard Test Method for Nuclear-Grade Activated Carbon.
18. ESR 97-00078 Revision 1, Charcoal Testing for CBEAF per ASTM D3803-1989.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 201 TO FACILITY OPERATING LICENSE NO. DPR-71
AND AMENDMENT NO. 231 TO FACILITY OPERATING LICENSE NO. 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 April 30, 1997, as supplemented October 28, 1997, and May 15, 1998, Carolina Power & Light Company (the licensee) requested amendments to the Surveillance Requirements (SRs) for the Technical Specifications (TS) at the Brunswick Steam Electric Plant (BSEP), Units 1 & 2. The proposed amendments would revise Surveillance Requirements 4.7.2.b.2 and 4.7.2.c to require testing of the control room emergency ventilation system's charcoal (at a temperature of 30°C and a relative humidity of 95%) in accordance with ASTM D3803-1989, "Standard Test Method for Nuclear-Grade Activated Carbon." The current testing demonstrates a filter efficiency of 95%. The proposed amendments would revise the acceptance criteria to allow a filter efficiency of 90%, consistent with the bounding calculations of control room doses. The October 28, 1997, and May 15, 1998, submittals contained supplemental information and did not expand the scope of the original Federal Register Notice or change the No Significant Hazards Consideration determination.

2.0 DISCUSSION AND EVALUATION

Currently, SRs 4.7.2.b.2 and 4.7.2.c are conducted in accordance with the guidance of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 1, 1976. The current testing assumes a relative humidity (RH) of 70% or less. The licensee discovered that with RH greater than 70%, TS testing under the current testing methodology does not assure a charcoal efficiency of 90% for iodine removal as assumed in the current control room dose analyses.

In accordance with the licensee's submittal, the proposed changes to Surveillance Requirements 4.7.2.b.2 and 4.7.2.c require that charcoal samples tested in accordance with the methodology of ASTM D3803-1989 meet the acceptance criteria of <5.0% penetration of methyl iodide. This corresponds to a filter efficiency of 90%, which is the filter efficiency assumed in the current bounding calculations of control room doses. In addition, the licensee

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states that the proposed acceptance criteria of <5% penetration of methyl iodide ensures that General Design Criterion (GDC) 19 dose limits for control room operators are not exceeded.

Current Requirements

Surveillance Requirement 4.7.2.b.2

Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 1, 1976.

Surveillance Requirement 4.7.2.c

After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, meets the laboratory testing criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 1, July 1976.

Proposed Revision

Surveillance Requirement 4.7.2.b.2

Verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, and tested in accordance with the methodology provided by ASTM D3803-1989, at a temperature of 30°C¹ and a relative humidity of 95%¹, meets the acceptance criteria of <5.0% penetration of methyl iodide.

Surveillance Requirement 4.7.2.c

After every 720 hours of charcoal adsorber operation by verifying within 31 days after removal that a laboratory analysis of a representative carbon sample obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 1, July 1976, and tested in accordance with the methodology provided by ASTM D3803-1989, at a temperature of 30°C¹, and a relative humidity of 95%¹, meets the acceptance criteria of <5.0% penetration of methyl iodide.

Current TS 4.7.2.b.2 and 4.7.2.c require that laboratory analyses of the carbon samples use the test procedures of and meet the acceptance criteria of Regulatory Position C.6.a of RG 1.52, Revision 1. Regulatory Position C.6.a refers to Table 3 of RG 1.52, Revision 1. Table 3

¹Laboratory testing within the temperature and humidity tolerances provided in Table 1 of ASTM D3803-1989 constitutes compliance with Surveillance Requirements 4.7.2.b.2 and 4.7.2.c.

references test 5b in table 2 of RG 1.52, Revision 1. Test 5.b references the test method from paragraph 4.5.3 of Military Specification RDT M 16-1T, "Gas Phase Adsorbents for Trapping Radioactive Iodine and Iodine Components," October 1973, but specifies that the test is to be conducted at 80°C and 95 % RH with preloading and postloading sweep at 25°C. This test is referred to as the "25-80-25 test." The essential elements of this test are as follows:

- 70-percent RH for air filtration systems designed to control the RH to 70 percent,
- 5-hour pre-equilibration (pre-sweep) time, with air at 25°C and 70 percent RH,
- 2-hour challenge, with gas at 80°C and 70 percent RH, and
- A 2-hour elution (post-sweep) time, with air at 25°C and 70 percent RH.

Note that the proposed SRs also require that samples be obtained as described in Regulatory Position C.6.b of RG 1.52, Revision 1, but specify that the samples be tested in accordance with ASTM D3803-1989, "Standard Test Method for Nuclear-Grade Activated Carbon" at 30°C and 95 percent RH. ASTM D3803-1989 is updated guidance based on an NRC verification and validation effort on ASTM D3803-1979, which is updated guidance based on RDT M16-1T. The essential elements of the proposed SR change for testing per ASTM D3803-1989 are:

- 95-percent RH
- 2-hour thermal stabilization, at 30°C,
- 16-hour pre-equilibration (pre-sweep) time, with air at 30°C and 95 percent RH,
- 2-hour equilibration time, with air at 30°C and 95 percent RH,
- 1-hour challenge, with gas at 30°C and 95 percent RH, and
- 1-hour elution (post-sweep) time, with air at 30°C and 95 percent RH.

The major differences between the current and proposed SR requirements for carbon testing are:

MAJOR DIFFERENCES	Proposed TS	Current TS
Pre-Equilibration (Pre-Sweep) Temperature	30°C	25°C
Challenge Temperature	30°C	80°C
Elution (Post-Sweep) Temperature	30°C	25°C
Total Pre-Test Equilibration	18 hours	5 hours
Relative Humidity	95%	70%
Tolerances of Test Parameters	Smaller	Larger

The discussion below demonstrates that these differences make the proposed SRs more conservative than the present requirements.

ASTM D3803-1989 challenges the representative charcoal samples at 30°C rather than at 80°C. The quantity of water retained by charcoal is dependent on temperature, with less water being retained as the temperature rises. The water retained by the charcoal decreases its efficiency in adsorbing other contaminants. Because most charcoal is anticipated to be challenged at a temperature closer to 30°C rather than 80°C, the lower temperature test condition of ASTM D3803-1989 will yield more realistic results than a test performed at 80°C.

ASTM D3803-1989 specifies a test temperature of 30°C for both the pre- and post-test sweep rather than 25°C. There is little difference in the adsorption behavior of charcoal between these two temperatures. A temperature of 25°C is more conservative; however, the increase from 25°C to 30°C does not represent a significant variation in the test results.

ASTM D3803-1989 provides results which are reproducible compared to RDT M16-1T because it has smaller tolerances on various test parameters, and it requires that the charcoal sample be pre-equilibrated for a much longer period. The longer pre-equilibration time is more conservative because it will completely saturate the representative charcoal sample until it is in the condition to which the subject charcoal adsorbers are expected to be exposed during design-basis accident conditions. During the pre-equilibration, the charcoal is exposed to a flow of air controlled at the test temperature and RH before the challenge gas is fed through the charcoal. The purpose of the pre-equilibration phase of the test is to ensure that the charcoal has stabilized at the specified test temperature and RH for a period of time which results in the charcoal adsorbing all the available moisture before the charcoal is challenged with methyl iodide. Hence, the proposed testing in accordance with ASTM D-3803-1989 standard would result in a more realistic prediction of the capability of the charcoal.

Performing the laboratory test of the charcoal samples at 70% RH is based on the system being designed to maintain the RH of the air stream entering the charcoal to $\leq 70\%$ under worst-case design basis conditions. The licensee discovered that the system could not maintain the RH to $\leq 70\%$. Therefore, the licensee has proposed to test at an RH of 95% instead of 70% to ensure that the charcoal can perform its function under worst-case design basis conditions. This is consistent with the requirements of ASTM D3803-1989 and is acceptable.

Proposed SRs 4.7.2.b.2 and 4.7.2.c require that the laboratory testing of charcoal samples shows a methyl iodide penetration of $\leq 5\%$. In the licensee's dose analysis, the control room emergency ventilation system charcoal beds are credited with a filter efficiency of 90%. The licensee's proposed acceptance criteria of $\leq 5\%$ methyl iodide penetration for the control room emergency ventilation system includes a safety factor of two which provides the staff with a degree of assurance that, at the end of the operating cycle, the charcoal will be capable of performing at a level at least as good as that assumed in the licensee's dose analysis. This factor of safety is acceptable based on the accuracy of test results obtained using the ASTM D3803-1989 standard.

The testing criteria of ASTM D3803-1989 are more stringent than those provided by the guidance of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 1, 1976. For example, the testing temperature required by ASTM D3803-1989 is $30 \pm 0.2^\circ\text{C}$ whereas the testing temperature of Regulatory Guide 1.52 is $80 \pm 2^\circ\text{C}$. ASTM D3803-1989 requires an RH of 95% versus 70% for Regulatory Guide 1.52. Because of these parameters, testing in accordance with the requirements of ASTM D3803-1989 is more conservative than testing in accordance with the criteria of Regulatory Position C.6.a of Regulatory Guide 1.52, Revision 1, 1976.

The NRC staff reviewed the proposed changes to SRs 4.7.2.b.2 and 4.7.2.c and concluded that the proposed changes to the SRs will revise the control room emergency ventilation system charcoal filter testing program for BSEP such that these changes will correct the existing flawed test methodology. The staff also concluded that the proposed changes will adequately demonstrate the operability of the system, and therefore, are acceptable.

3.0 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.

4.0 ENVIRONMENTAL CONSIDERATION

These amendments involve a change in the installation or use of a facility component located within the restricted area, as defined in 10 CFR Part 20, and change surveillance requirements. 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 (62 FR 40846). Accordingly, the amendments meet the eligibility criteria for categorical

impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

5.0 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.

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