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August 11, 2005

SERIAL: BSEP 05-0094  
TSC-2005-04

10 CFR 50.90

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2  
Docket Nos. 50-325 and 50-324/License Nos. DPR-71 and DPR-62  
Request for License Amendments – Appendix J Leakage Rate Testing  
Instrumentation Accuracy, Technical Specification 5.5.12, "Primary Containment  
Leakage Rate Testing Program"

Ladies and Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.90, Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc. (PEC), is requesting a revision to the Technical Specifications (TSs) for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2. The proposed license amendments revise TS 5.5.12, "Primary Containment Leakage Rate Testing Program," by removing an exception that allows for compensation of flow meter instrument inaccuracies in accordance with ANSI/ANS-56.8-1987 rather than meeting the instrument accuracy requirements in ANSI/ANS-56.8-1994. The exception is no longer necessary due to the availability of test instruments capable of satisfying the instrument accuracy requirements in ANSI/ANS-56.8-1994.

PEC has evaluated the proposed change in accordance with 10 CFR 50.91(a)(1), using the criteria in 10 CFR 50.92(c), and determined that this change involves no significant hazards considerations.

In accordance with 10 CFR 50.91(b), PEC is providing the State of North Carolina a copy of the proposed license amendments.

In order to support planning for containment leakage testing being performed during the BSEP, Unit 1 refueling outage which begins March 4, 2006, PEC requests approval of this request no later than February 1, 2006. Once approved, the amendment for Unit 1 shall be implemented prior to start-up following Refueling Outage 15 (i.e., B116R1), and the amendment for Unit 2 shall be implemented within 120 days following issuance.

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There are no commitments contained in this letter. Please refer any questions regarding this submittal to Mr. Edward T. O'Neil, Manager - Support Services, at (910) 457-3512.

I declare, under penalty of perjury, that the foregoing is true and correct. Executed on August 11, 2005.

Sincerely,



Cornelius J. Gannon

WRM/wrm

Enclosures:

1. Evaluation of Proposed License Amendment Request
2. Marked-up Technical Specification Pages - Unit 1
3. Typed Technical Specification Pages - Unit 1
4. Typed Technical Specification Pages - Unit 2

cc (with enclosures):

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## **Evaluation of Proposed License Amendment Request**

**Subject:** Technical Specification 5.5.12, "Primary Containment Leakage Rate Testing Program"

### **1.0 Description**

This letter is a request to revise the Technical Specifications (TS) for Facility Operating Licenses DPR-71 and DPR-62 for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2. The proposed change revises TS 5.5.12, "Primary Containment Leakage Rate Testing Program," by removing an exception that allows for compensation of flow meter instrument inaccuracies in accordance with ANSI/ANS-56.8-1987 rather than meeting the instrument accuracy requirements in ANSI/ANS-56.8-1994.

### **2.0 Proposed Change**

The proposed change removes item "a" in TS 5.5.12, "Primary Containment Leakage Rate Testing Program." Item "a" provides an exception to the containment leakage rate testing program and allows for compensation of flow meter instrument inaccuracies in accordance with ANSI/ANS-56.8-1987 rather than using instruments that satisfy the accuracy provisions of ANSI/ANS-56.8-1994.

For convenience, Enclosure 2 contains a marked-up version of the Unit 1 TSs showing the proposed changes. Since TS Section 5.5.12 for Unit 1 and Unit 2 are identical, only the mark-up for Unit 1 is provided. Enclosures 3 and 4 provide typed versions of the Unit 1 and Unit 2 TSs, respectively. These typed TS pages are to be used for issuance of the proposed amendment.

### **3.0 Background**

On February 1, 1996, the NRC issued Amendments 181 and 213 to the Facility Operating Licenses for BSEP, Units 1 and 2, respectively. These amendments revised the Technical Specifications to permit the use of performance-based containment leakage rate testing in accordance with 10 CFR 50, Appendix J, Option B. As part of this approval, the NRC authorized an exception to the leakage rate flow meter instrument accuracy requirements.

Currently, TS 5.5.12 states that the primary containment leakage rate testing program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," September 1995, as modified by the listed exceptions. Regulatory Guide 1.163, Section C, "Regulatory Position," states that NEI 94-01, Revision 0, dated July 26, 1995, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50 Appendix J," provides methods that are acceptable to the NRC for complying with the provisions of 10 CFR 50, Appendix J, Option B. NEI 94-01 references ANSI/ANS-56.8-1994 as the industry standard on testing methodologies. The

ANSI/ANS-56.8-1994 testing methodologies require leakage rate flow meters with an accuracy of 2 percent of full scale.

TS 5.5.12, Item "a" allows for the compensation of instrument accuracies applied to the primary containment leakage total in accordance with ANSI/ANS-56.8-1987 instead of ANSI/ANS-56.8-1994. Under this proposed change, the item "a" exception will be eliminated and leak testing instruments will be used which satisfy ANSI/ANS-56.8-1994.

#### **4.0 Technical Analysis**

As previously stated, when the NRC issued Amendments 181 and 213 to permit the use of performance-based containment leakage rate testing in accordance with 10 CFR 50, Appendix J, Option B, an exception was authorized to the leakage rate flow meter instrument accuracy requirements. The exception allows for the compensation of inaccuracies in instrumentation used to measure the primary containment leakage total in accordance with ANSI/ANS-56.8-1987 rather than ANSI/ANS-56.8-1994.

At the time the license amendment was issued, the Brunswick Plant was using flow meters with a 5 percent of full scale accuracy rather than flow meters that satisfied the 2 percent accuracy specified in ANSI/ANS-56.8-1994. To compensate for instrument inaccuracy, an equipment error is applied to the results of each leakage test, and the square root of the sum of the squares of the equipment errors for the leakage tests are added to the cumulative containment leakage total. This method is consistent with ANSI/ANS 56.8-1987, Appendix E, and conservatively accounts for instrument inaccuracy.

The exception is no longer necessary due to the availability of test instruments that comply with instrument accuracy provisions of ANSI/ANS-56.8-1994. Use of instruments that satisfy the accuracy requirements in ANSI/ANS-56.8-1994 is consistent with NEI 94-01, and thus complies with Regulatory Guide 1.163.

#### **5.0 Regulatory Safety Analysis**

##### **5.1 No Significant Hazards Consideration**

The proposed license amendments revise Technical Specification (TS) 5.5.12, "Primary Containment Leakage Rate Testing Program," by removing an exception that allows for compensation of instrumentation inaccuracies in accordance with ANSI/ANS-56.8-1987 rather than ANSI/ANS-56.8-1994. Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc. (PEC), has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed removal, from Technical Specification 5.5.12, of an exception that allows for compensation of instrumentation inaccuracies in accordance with ANSI/ANS-56.8-1987, rather than ANSI/ANS-56.8-1994, does not involve physical changes to any plant structure, system, or component. Furthermore, removal of the exception allowing for the accounting for containment leakage rate test instrumentation accuracy using ANSI/ANS-56.8-1987 has no impact on the initiating frequency for any previously evaluated accident. Therefore, the proposed change cannot increase the probability of a previously evaluated accident.

The consequences of a previously evaluated accident are dependent on the initial conditions assumed for the analysis, the behavior of the fuel during the analyzed accident, the availability and successful functioning of the equipment assumed to operate in response to the evaluated event, and the setpoints at which these actions are initiated. Use of leakage rate test instruments that meet the accuracy provisions of ANSI/ANS-56.8-1994 complies with NEI 94-01, Revision 0, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50 Appendix J," and Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," September 1995, and ensures that measured containment leakage rates are maintained within specified limits.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

Creation of the possibility of a new or different kind of accident would require the creation of one or more new precursors to that accident. New accident precursors may be created by modifications of the plant configuration, including changes in allowable modes of operation. The proposed change regarding containment leakage test instrument accuracy does not involve installation of any new or different equipment. No installed equipment is being operated in a different manner than currently evaluated. No new initiating events or transients will result from the use of more accurate containment leakage test instruments. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed removal, from Technical Specification 5.5.12, of an exception that allows for compensation of instrumentation inaccuracies in accordance with ANSI/ANS-56.8-1987 rather than ANSI/ANS-56.8-1994 does not alter the assumptions of the accident analyses or the Technical Specification Bases. The margin of safety is established through the design of the plant structures, systems, and components; through the parameters within which the plant is operated; through the establishment of setpoints for actuation of equipment relied upon to respond to an event; and through margins contained within the safety analyses. The use of industry standard ANSI/ANS-56.8-1994, rather than ANSI/ANS-56.8-1987, in accounting for the accuracy of containment leakage rate testing instrumentation will not adversely impact the performance of plant structures, systems, components, and setpoints relied upon to respond to mitigate an accident or transient. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, PEC concludes that the proposed amendments present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

## 5.2 Applicable Regulatory Requirements/Criteria

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 General Design Criteria (GDC), published in the Federal Register on May 21, 1971 as Appendix A to 10 CFR Part 50.

Criterion 52, "Capability for containment leakage rate testing," requires that the reactor containment and other equipment which may be subjected to containment test conditions be designed so that periodic integrated leakage rate testing can be conducted at containment design pressure. Criterion 53, "Provisions for containment testing and inspection," requires that the reactor containment be designed to permit periodic testing at containment design pressure of the leak tightness of penetrations which have resilient seals and expansion bellows. Criterion 54, "Piping systems penetrating containment," requires that piping systems penetrating primary reactor containment be designed with a capability to test periodically the operability of isolation valves and associated apparatus and to determine if valve leakage is within acceptable limits.

Regulatory Guide (RG) 1.163, "Performance-Based Containment Leak-Test Program," September 1995, approved the industry guideline NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J." NEI 94-01 describes a performance-based leak test program, leakage-rate test methods, procedures, and analyses that the NRC found acceptable for implementing performance-based containment leakage testing. NEI 94-01 specifies that leakage rate test instruments should meet the accuracy requirements in ANSI/ANS-56.8-1994. The proposed change adopts the instrument accuracy requirements in ANSI/ANS-56.8-1994 rather than compensating for instrument inaccuracy consistent with

ANSI/ANS-56.8-1987. The design functions of the containment are not affected by the proposed change.

Based on the considerations discussed above: (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.

## **6.0 Environmental Considerations**

10 CFR 51.22(c)(9) identifies certain licensing and regulatory actions, which are eligible for categorical exclusion from the requirement to perform an environmental assessment.

A proposed amendment to an operating license for a facility does not require an environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration; (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite; or (3) result in a significant increase in individual or cumulative occupational radiation exposure.

The proposed amendments meet the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, in accordance with 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

## **7.0 References**

1. Code of Federal Regulations, Title 10, Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors"
2. NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J"
3. Regulatory Guide (RG) 1.163, "Performance-Based Containment Leak-Test Program," September 1995
4. ANSI/ANS-56.8-1994, American National Standard for Containment System Leakage Testing Requirements
5. ANSI/ANS-56.8-1987, Containment System Leakage Testing Requirements



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Enclosure 2

**Marked-up Technical Specification Pages - Unit 1**

5.5 Programs and Manuals

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Primary Containment Leakage Rate Testing Program (continued)

- Not used.
- a. ~~Compensation of instrument accuracies applied to the primary containment leakage total in accordance with ANSI/ANS 56.8-1997 instead of ANSI/ANS 56.8-1994;~~
  - b. Following air lock door seal replacement, performance of door seal leakage rate testing with the gap between the door seals pressurized to 10 psig instead of air lock testing at  $P_a$  as specified in Nuclear Energy Institute Guideline 94-01, Revision 0;
  - c. Reduced duration Type A tests may be performed using the criteria and Total Time method specified in Bechtel Topical Report BN-TOP-1, Revision 1.
  - d. Performance of Type C leak rate testing of the hydrogen and oxygen monitor isolation valves is not required; and
  - e. Performance of Type C leak rate testing of the main steam isolation valves at a pressure less than  $P_a$  instead of leak rate testing at  $P_a$  as specified in ANSI/ANS 56.8-1994.
  - f. NEI 94-01 - 1995, Section 9.2.3: The first Type A test performed after the February 15, 1991, Type A test shall be performed no later than April 15, 2004.

The peak calculated primary containment internal pressure for the design basis loss of coolant accident,  $P_a$ , is 49 psig.

The maximum allowable primary containment leakage rate,  $L_a$ , shall be 0.5% of primary containment air weight per day at  $P_a$ .

Leakage rate acceptance criteria are:

- a. Primary containment leakage rate acceptance criterion is  $\leq 1.0 L_a$ . During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are  $< 0.60 L_a$  for Type B and C tests and  $\leq 0.75 L_a$  for Type A tests.
- b. Air lock testing acceptance criteria are:
  - 1) Overall air lock leakage rate is  $\leq 0.05 L_a$  when tested at  $\geq P_a$ .

(continued)

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Enclosure 3

**Typed Technical Specification Pages - Unit 1**

5.5 Programs and Manuals

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Primary Containment Leakage Rate Testing Program (continued)

- a. Not used.
- b. Following air lock door seal replacement, performance of door seal leakage rate testing with the gap between the door seals pressurized to 10 psig instead of air lock testing at  $P_a$  as specified in Nuclear Energy Institute Guideline 94-01, Revision 0;
- c. Reduced duration Type A tests may be performed using the criteria and Total Time method specified in Bechtel Topical Report BN-TOP-1, Revision 1.
- d. Performance of Type C leak rate testing of the hydrogen and oxygen monitor isolation valves is not required; and
- e. Performance of Type C leak rate testing of the main steam isolation valves at a pressure less than  $P_a$  instead of leak rate testing at  $P_a$  as specified in ANSI/ANS 56.8-1994.
- f. NEI 94-01 - 1995, Section 9.2.3: The first Type A test performed after the February 15, 1991, Type A test shall be performed no later than April 15, 2004.

The peak calculated primary containment internal pressure for the design basis loss of coolant accident,  $P_a$ , is 49 psig.

The maximum allowable primary containment leakage rate,  $L_a$ , shall be 0.5% of primary containment air weight per day at  $P_a$ .

Leakage rate acceptance criteria are:

- a. Primary containment leakage rate acceptance criterion is  $\leq 1.0 L_a$ . During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are  $< 0.60 L_a$  for Type B and C tests and  $\leq 0.75 L_a$  for Type A tests.
- b. Air lock testing acceptance criteria are:
  - 1) Overall air lock leakage rate is  $\leq 0.05 L_a$  when tested at  $\geq P_a$ .

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(continued)

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Enclosure 4

**Typed Technical Specification Pages - Unit 2**

5.5 Programs and Manuals

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5.5.12 Primary Containment Leakage Rate Testing Program (continued)

- a. Not Used.
- b. Following air lock door seal replacement, performance of door seal leakage rate testing with the gap between the door seals pressurized to 10 psig instead of air lock testing at  $P_a$  as specified in Nuclear Energy Institute Guideline 94-01, Revision 0;
- c. Reduced duration Type A tests may be performed using the criteria and Total Time method specified in Bechtel Topical Report BN-TOP-1, Revision 1.
- d. Performance of Type C leak rate testing of the hydrogen and oxygen monitor isolation valves is not required; and
- e. Performance of Type C leak rate testing of the main steam isolation valves at a pressure less than  $P_a$  instead of leak rate testing at  $P_a$  as specified in ANSI/ANS 56.8-1994.
- f. NEI 94-01 – 1995, Section 9.2.3: The first Type A test performed after the February 28, 1993, Type A test shall be performed no later than April 30, 2005.

The peak calculated primary containment internal pressure for the design basis loss of coolant accident,  $P_a$ , is 49 psig.

The maximum allowable primary containment leakage rate,  $L_a$ , shall be 0.5% of primary containment air weight per day at  $P_a$ .

Leakage rate acceptance criteria are:

- a. Primary containment leakage rate acceptance criterion is  $\leq 1.0 L_a$ . During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are  $< 0.60 L_a$  for Type B and C tests and  $\leq 0.75 L_a$  for Type A tests.
- b. Air lock testing acceptance criteria are:
  - 1) Overall air lock leakage rate is  $\leq 0.05 L_a$  when tested at  $\geq P_a$ .