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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 181 TO FACILITY OPERATING LICENSE NO. DPR-71

AND AMENDMENT NO. 213 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 September 13, 1995, as amended on November 27, 1995, and January 29, 1996, the Carolina Power and Light Company (the licensee) proposed a change to the Technical Specifications (TS) for the Brunswick Steam Electric Plant, Units No. 1 and No. 2 (BSEP-1&2). The proposed TS change would permit the use of 10 CFR Part 50, Appendix J, Option B, Performance-Based Requirements.

2.0 BACKGROUND

Compliance with Appendix J provides assurance that the primary containment, and those systems and components which penetrate the primary containment, do not exceed the allowable leakage rate values specified in the Technical Specifications and Bases. The allowable leakage rate is determined so that the leakage assumed in the safety analyses is not exceeded.

On February 4, 1992, the NRC published a notice in the Federal Register (57 FR 4166) discussing a planned initiative to eliminate requirements marginal to safety which impose a significant regulatory burden. Appendix J of 10 CFR Part 50, "Primary Containment Leakage Testing for Water-Cooled Power Reactors" was considered for this initiative and the staff undertook a study of possible changes to this regulation. The study examined the previous performance history of domestic containments and examined the effect on risk of a revision to the requirements of Appendix J. The results of this study are reported in NUREG-1493, "Performance-Based Leak-Test Program."

Based on the results of this study, the staff developed a performance-based approach to containment leakage rate testing. On September 12, 1995, the NRC approved issuance of this revision to 10 CFR Part 50, Appendix J, which was subsequently published in the Federal Register on September 26, 1995, and became effective on October 26, 1995. The revision added Option B "Performance-Based Requirements" to Appendix J to allow licensees to voluntarily replace the prescriptive testing requirements of Appendix J with testing requirements based on both overall and individual component leakage rate performance.

Regulatory Guide 1.163, September 1995, "Performance-Based Containment Leak Test Program," was developed as a method acceptable to the NRC staff for implementing Option B. This regulatory guide states that the Nuclear Energy Institute (NEI) document NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50, Appendix J" provides methods acceptable to the NRC staff for complying with Option B with four exceptions which are described therein.

Option B requires that the regulatory guide or other implementation document used by a licensee to develop a performance-based leakage testing program must be included, by general reference, in the plant technical specifications.

Regulatory Guide 1.163 specifies an extension in Type A test frequency from three approximately equally spaced tests in 10 years to at least one test in 10 years based upon two consecutive successful tests. Type B tests may be extended up to a maximum of 10 years based upon completion of two consecutive successful tests and Type C tests may be extended up to 5 years based on two consecutive successful tests.

By letter dated October 20, 1995, NEI proposed TS implementing Option B. After some discussion, the staff and NEI agreed on a set of model TS which were transmitted to NEI in a letter dated November 2, 1995. These TS are to serve as a model for licensees to develop plant-specific TS in preparing amendment requests to implement Option B.

In order for a licensee to determine the performance of each component, factors that are indicative of or affect performance, such as an administrative leakage limit, must be established. The administrative limit is selected to be indicative of the potential onset of component degradation. Although these limits are subject to NRC inspection to assure that they are selected in a reasonable manner, they are not technical specification requirements. Failure to meet an administrative limit requires the licensee to return to the minimum test interval for that component.

Option B requires that the licensee maintain records to show that the criteria for Type A, B and C tests have been met. In addition, the licensee must maintain comparisons of the performance of the overall containment system and the individual components to show that the test intervals are adequate. These records are subject to NRC inspection.

3.0 SPECIFIC TS CHANGES

The licensee proposed the following changes to the BSEP 1&2 TS.

Specification 3/4.6.1.2, Primary Containment Leakage Rates

- Specification 3.6.1.2.a.2 - The leakage rate limit for reduced pressure containment leakage testing is being deleted since reduced pressure testing is not an option available under the Regulatory Guide 1.163/NEI 94-01 performance-based leakage testing program.

- Specification 3.6.1.2.b - This specification and the associated ACTION statements are being revised to indicate that the combined leakage rate for valves and penetrations shall be in accordance with the new Primary Containment Leakage Rate Testing Program. The Table 3.6.3-1 reference is being removed because this table was previously relocated from the Technical Specifications (Amendments 149 and 179 for Unit 1 and Unit 2, respectively).

- Specification 4.6.1.2 - This specification regarding the schedule and criteria for demonstrating primary containment leakage rates has been renumbered to 4.6.1.2.1 and revised to require the performance of primary containment leakage rate testing in accordance with the Primary Containment Leakage Rate Testing Program described in the new Specification 6.8.3.4.

  Since a performance-based leakage testing program is being established and will be controlled through the Primary Containment Leakage Rate Testing Program, the detailed requirements regarding Type B and C testing (Specification 4.6.1.2.d) are being deleted.

  - Containment air locks are required to be tested pursuant to Specification 4.6.1.3; therefore, Specification 4.6.1.2.e is duplicative and is being deleted.

  - Specification 4.6.1.2.f, which requires that main steam isolation valves be tested at least once per 18 months, is being retained and renumbered to 4.6.1.2.2. Main steam line isolation valves are outside the scope of performance-based testing and leakage testing of these valves will continue to be performed in accordance with current Technical Specification 4.6.1.2.f.

  - The statement that the provisions of Specification 4.0.2 are not applicable to 24 month surveillance intervals (Specification 4.6.1.2.h) is being deleted, since the only references to a 24-month test frequency (in Specification 4.6.1.2.d) are being removed. The performance-based leakage rate testing program will establish the specific test frequencies based on component and system performance.

Specification 3/4.6.1.3, Primary Containment Air Locks

- Specification 4.6.1.3.a.1 - This specification is being revised to require verification of the primary containment air lock seal leakage rate within 7 days (versus the current 72 hour period) after each closing. The 7-day test frequency is consistent with the test frequency specified in NEI 94-01, Section 10.2.2.1 (Containment Airlocks — Test Intervals). Verification of the primary containment air lock seal leakage rate after multiple entries is being required at least every 30 days (versus the current 72 hours). The 30-day test frequency for the period of

multiple containment entries is also consistent with the frequency specified in NEI 94-01, Section 10.2.2.1 (Containment Airlocks — Test Intervals).

- Specification 4.6.1.3.b.1 - This specification is being revised to require performance of an overall air lock leakage rate test every 30 months instead of the current six-month frequency. The 30-month test frequency is consistent with the periodic test frequency specified in NEI 94-01, Section 10.2.2.1 (Containment Airlocks — Test Intervals).

Specification 3/4.6.1.4, Primary Containment Structural Integrity

- Specification 4.6.1.4.1 - This specification is being revised to require the performance of visual examinations of the accessible areas of the primary containment interior and exterior surfaces consistent with NRC Regulatory Guide 1.163, Section C, paragraph 3. These examinations will be conducted prior to performing a Type A test and during two other refueling outages before the next Type A test (if the interval for the Type A test has been extended to 10 years).

Specification 6.8, Procedures and Programs

- Specification 6.8 - The title for Specification 6.8 is being revised to "Procedures, Programs, and Manuals."

- Specification 6.8.3 - This specification is being revised to add a title "Programs and Manuals." Specification 6.8.3.a is being renumbered to 6.8.3.1, Specification 6.8.3.b is being renumbered to 6.8.3.2, and Specification 6.8.3.c is being renumbered to 6.8.3.3. A new Specification 6.8.3.4 is being added to describe the Primary Containment Leakage Rate Testing Program. The Specification states that the program implements primary containment leakage rate testing as required by 10 CFR 50, Appendix J, Option B and the guidelines contained in NRC Regulatory Guide 1.163, dated September 1995. Specification 6.8.3.4 will identify the plant-specific value for L_a, the maximum allowable primary containment leakage rate, and the value for P_a, the peak calculated primary containment internal pressure. The values of P_a and L_a are currently referenced in Specifications 3/4.6.1.2 and 3/4.6.1.3 and are not being changed as part of this license amendment request. Also, Specification 6.8.3.4 will identify the approved plant-specific exceptions to the implementation process stipulated in NRC Regulatory Guide 1.163 and NEI 94-01. The only exceptions requested by the licensee and to be included in this specification are:
  (1) an exception to leakage rate flowmeter instrument accuracy requirements. The licensee's flowmeter does not meet the instrument accuracy requirements specified in ANSI/ANS 56.8-1994, which is the industry standard on testing methodologies referenced in NEI 94-01. To overcome the

effects of the less accurate flowmeter, the licensee will apply an instrument error to the results of each test. The licensee additionally will add the square root of the sum of the squares of the instrument errors for the tests to the cumulative containment leakage total. This approach is consistent with ANSI 56.8-1987, Appendix E, and conservatively accounts for instrument inaccuracy.

(2) an exception regarding the testing of containment airlocks following door seal replacements. Instead of requiring testing of the airlock at P_a, as called for by NEI 94-01, following such maintenance, the exception allows an alternative test to be performed wherein the gap between the door seals is pressurized to 10 psig. This approach is consistent with a previously approved exemption to 10 CFR Part 50, Appendix J.

Bases

- Bases for Specification 3/4.6.1.2 - This section has been expanded to clarify the safety objectives stipulated in 10 CFR 50, Appendix A, "General Design Criteria for Nuclear Power Plants" for primary containments. Also, the regulatory requirements contained in 10 CFR 50, Appendix J, Option B and the requirements provided in NRC Regulatory Guide 1.163 and NEI 94-01 for implementation of a performance-based containment leakage rate testing program have been described, along with any exceptions being taken to these regulatory positions. A reference to the granting of a previous exemption from 10 CFR 50 regarding the testing of air locks after each opening is being deleted since the requirements of Regulatory Guide 1.163 and NEI 94-01 will now be followed.

- Bases for Specification 3/4.6.1.3 - This section has been expanded to address the regulatory requirements for air locks for primary containments. The regulatory requirements contained in 10 CFR 50, Appendix J, Option B and the implementation requirements provided in NRC Regulatory Guide 1.163 and NEI 94-01 pertaining to air lock leakage testing have been described.

- Bases for Specification 3/4.6.1.4 - This section has been modified to include the regulatory basis for performing the visual examinations of the accessible containment interior and exterior surfaces.

4.0 EVALUATION

The licensee's September 13, 1995 letter to the NRC, as amended on November 27, 1995, and January 29, 1996, proposed TS changes that permit the use of Option B of the revised 10 CFR Part 50 Appendix J. These TS changes refer to Regulatory Guide 1.163, September 1995, "Performance-Based Containment Leak Test Program" which specifies a method acceptable to the NRC for complying with Option B. This requires the TS changes listed above.

Option B permits a licensee to choose Type A; or Type B and C; or Type A, B and C testing to be done on a performance basis. The licensee has elected to perform Type A, B and C testing on a performance basis.

The exception to the guidelines contained in Regulatory Guide 1.163 and NEI 94-01 regarding leakage rate flowmeter accuracy is acceptable in that the licensee will conservatively account for the inaccuracy of its flowmeter through adherence to the methodology described in ANSI/ANS 56.8-1987, Appendix E.

The exception to the guidelines contained in Regulatory Guide 1.163 and NEI 94-01 regarding the testing of containment airlocks after seal replacement by means of pressurization between the seals to 10 psig is consistent with a previously approved exemption to 10 CFR Part 50, Appendix J and, therefore, is acceptable.

These TS changes replace specific surveillance requirements related to primary containment leakage rate testing and the corresponding acceptance criteria and test methods with a requirement to perform the required testing in accordance with Option B and approved exemptions using the guidance in Regulatory Guide 1.163 and the exceptions thereto discussed above. The staff has reviewed the licensee's proposed changes and finds that all the important elements of the guidance provided in the NRC letter to NEI dated November 2, 1995, are included in the TS proposed by the licensee and that the proposed changes meet the requirements of 10 CFR Part 50, Appendix J, Option B. The staff therefore concludes that the licensee's request to implement 10 CFR Part 50, Appendix J, Option B is acceptable.

5.0 STATE CONSULTATION

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

6.0 ENVIRONMENTAL CONSIDERATION

These 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 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 these amendments involve no significant hazards consideration and there has been no public comment on such finding (60 FR 63739 dated December 12, 1995). Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

7.0 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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