

May 28, 1996

Mr. C. S. Hinnant, Vice President  
Carolina Power & Light Company  
H. B. Robinson Steam Electric Plant  
Unit No. 2  
3581 West Entrance Road  
Hartsville, South Carolina 29550

SUBJECT: ISSUANCE OF AMENDMENT NO. 169 TO FACILITY OPERATING LICENSE NO. DPR-23 REGARDING PERFORMANCE-BASES CONTAINMENT INTEGRATED LEAK RATE TESTING - H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2 (TAC NO. M94612)

Dear Mr. Hinnant:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 169 to Facility Operating License No. DPR-23 for the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBR). This amendment changes the HBR Technical Specifications (TS) in response to your request dated January 31, 1996.

The amendment revises the TS section 4.4 to allow the use of 10 CFR Part 50, Appendix J, Option B, Performance-Based Containment Leakage Rate Testing. A new TS section 6.12 describes the containment leakage rate testing program that adopts 10 CFR Part 50, Appendix J, Option B for type A tests; and 10 CFR Part 50, Appendix J, Option A, for types B and C tests. The Bases are also changed to reflect the TS changes.

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

Sincerely,

Original signed by:

Brenda L. Mozafari, Project Manager  
Project Directorate II-1  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket No. 50-261

Enclosures:

1. Amendment No. 169 to DPR-23
2. Safety Evaluation

cc w/enclosures:  
See next page

FILENAME: G:\ROBINSON\ROB94612.AMD \*see previous concurrence

LA:PDII-1	PM:PDII-1	OGC*	D:PDII-1
EDunnington <i>EAD</i>	BMozafari <i>BM</i>	EHoller	EImbro <i>BCB</i>
5/28/96	5/21/96	5/16/96	5/22/96
(Yes/No)	(Yes/No)	Yes/No	Yes/No

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Mr. C. S. Hinnant  
Carolina Power & Light Company

H. B. Robinson Steam Electric  
Plant, Unit No. 2

cc:

Mr. William D. Johnson  
Vice President and Senior Counsel  
Carolina Power & Light Company  
Post Office Box 1551  
Raleigh, North Carolina 27602

Mr. Dayne H. Brown, Director  
Department of Environmental,  
Health and Natural Resources  
Division of Radiation Protection  
Post Office Box 27687  
Raleigh, North Carolina 27611-7687

Ms. Karen E. Long  
Assistant Attorney General  
State of North Carolina  
Post Office Box 629  
Raleigh, North Carolina 27602

Mr. Robert P. Gruber  
Executive Director  
Public Staff - NCUC  
Post Office Box 29520  
Raleigh, North Carolina 27626-0520

U.S. Nuclear Regulatory Commission  
Resident Inspector's Office  
H. B. Robinson Steam Electric Plant  
2112 Old Camden Road  
Hartsville, South Carolina 29550

Mr. Max Batavia, Chief  
South Carolina Department of Health  
Bureau of Radiological Health  
and Environmental Control  
2600 Bull Street  
Columbia, South Carolina 29201

Regional Administrator, Region II  
U.S. Nuclear Regulatory Commission  
101 Marietta St., N.W., Ste. 2900  
Atlanta, Georgia 30323

Mr. J. Cowan  
Manager  
Nuclear Services and Environmental  
Support Department  
Carolina Power & Light Company  
Post Office Box 1551 - Mail OHS7  
Raleigh, North Carolina 27602

Mr. Dale E. Young  
Plant General Manager  
Carolina Power & Light Company  
H. B. Robinson Steam Electric Plant  
3581 West Entrance Road  
Hartsville, South Carolina 29550

Mr. Milton Shymlock  
U. S. Nuclear Regulatory Commission  
101 Marietta Street, N.W. Suite 2900  
Atlanta, Ga. 3023-0199

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

Mr. R. M. Krich  
Manager - Regulatory Affairs  
Carolina Power & Light Company  
H. B. Robinson Steam Electric Plant,  
Unit No. 2  
3581 West Entrance Road  
Hartsville, South Carolina 29550

AMENDMENT NO. 169 TO FACILITY OPERATING LICENSE NO. DPR-23 - H. B. ROBINSON  
STEAM ELECTRIC PLANT, UNIT NO. 2

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

CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-261

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 169  
License No. DPR-23

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Carolina Power & Light Company (the licensee), dated January 31, 1996, 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 3.B. of Facility Operating License No. DPR-23 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 169 , 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 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

*Eugene V. Imbro for*

Eugene V. Imbro, 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: May 28, 1996

ATTACHMENT TO LICENSE AMENDMENT NO. 169

FACILITY OPERATING LICENSE NO. DPR-23

DOCKET NO. 50-261

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised areas are indicated by marginal lines.

<u>Remove Pages</u>	<u>Insert Pages</u>
4.4-1	4.4-1
4.4-2	4.4-2
4.4-3	4.4-3
4.4-4	4.4-4
4.4-8	4.4-8
4.4-9	4.4-9
4.4-10	4.4-10
6.12-1	6.12-1

Applicability

Applies to containment leakage and structural integrity.

Objective

To verify that potential leakage from the containment and that pre-stressing tendon loads are maintained within acceptable values.

Specification4.4.1 Operational Leakage Rate Testing

Required visual examinations and leakage rate testing shall be performed in accordance with the Containment Leakage Rate Testing Program, except for testing of the containment personnel air lock. The containment personnel air lock shall be tested every six months.

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#### 4.4.2

#### Isolation Valve Tests

- a. Isolation valves shall be tested for operability at each refueling.
- b. Isolation valves which are pressurized by the penetration pressurization system will be leak tested in accordance with the containment leakage rate testing program.
- c. The isolation seal water system shall be operated to demonstrate the capability for sealing the associated containment isolation valves at each refueling.

#### 4.4.3

#### Post Accident Recirculation Heat Removal System

- a. The portion of the Residual Heat Removal System that is downstream of the first isolation valve outside the containment shall be tested either by use in normal operation or hydrostatically tested at 350 psig at the interval specified below.
- b. Visual inspection shall be made for excessive leakage from components of the system. Any visual leakage that cannot be stopped at test conditions shall be measured by collection and weighing or by another equivalent method.
- c. The acceptance criterion is that maximum allowable leakage from the recirculation heat removal system components (which includes valve stems, flanges and pump seals) shall not exceed two gallons per hour.
- d. Repairs shall be made as required to maintain leakage with the acceptance criterion in c. above.

- c. Notification of the pending test, either of a sample tendon or the containment structural test, along with detailed acceptance criteria shall be forwarded to the Nuclear Regulatory Commission two months prior to the actual test. Within six months of conducting the test, a report and evaluation shall be submitted to the NRC.

### Basis

The containment is designed for an accident pressure of 42 psig.<sup>(1)</sup> While the reactor is operating, the internal environment of the containment will be air at approximately atmospheric pressure and a maximum temperature of 120°F. Post-accident conditions are documented in the Updated Final Safety Analysis Report.

Prior to initial operation, the containment was strength tested at 48.3 psig and then was leak-tested. The acceptance criterion for this preoperational leakage rate test was established as 0.08 weight percent of the contained air per 24 hours at the design pressure of 42 psig. This acceptable leakage rate was equivalent to a 0.1 weight percent of the contained steam-air atmosphere per 24 hours at 42 psig and 263°F. The acceptance criteria for Integrated Leakage Rate Tests (ILRTs) is now defined in Technical Specifications Section 6.12. These leakage rates are consistent with the construction of the containment,<sup>(2)</sup> which is equipped with a penetration pressurization system which pressurizes penetrations, double gasketed seals, and some isolation valve spaces. The channels over all of the containment liner welds were independently leak-tested during construction.

The original safety analysis has been performed on the basis of a leakage rate of 0.10% per 24 hours at 42 psig and 263°F. With this leakage rate and with minimum containment engineered safety features operating, the public exposure would not exceed 10 CFR 100 guideline values in the event of the design basis accident.<sup>(3)</sup>

The performance of a periodic integrated leak rate test during plant life provides a current assessment of potential leakage from the containment in case of an accident that would pressurize the interior of the containment.

The specified frequency of periodic integrated leak rate tests is based on the following major considerations. First is the low probability of leaks in the liner, because of (a) the test of the leak tightness of the welds during erection; (b) conformance of the complete containment to a low leakage rate limit at the design pressure of 42 psig during preoperational testing which is consistent with 0.1% leakage at design basis accident (DBA) conditions; and (c) absence of any significant stresses in the liner during reactor operation.

Secondly, the penetration pressurization system is capable of continuously or periodically monitoring leakage from potential leak paths, such as penetrations, double gasketed seals, and spaces between certain containment isolation valves. Total leakage from the system is measured by summing the recorded flows in each of the four penetration headers. The penetration pressurization system is a qualified system for continuous or intermittent pressurization of individual or groups of containment penetrations as allowed in 10 CFR 50, Appendix J, Items III.B.1.(b), III.B.3.(b), and III.C.1.

A flow sensing device is located in each of the headers supplying make-up air to the four pressurized zones. A leakage rate alarm is provided in each of the four indicating channels to alert the operator in the control room. The flow measurement accuracy is within  $\pm 1\%$ . A flow of 0.04% of the containment volume per day at 42 psig is approximately 0.58 ft<sup>3</sup>/minute (2.34 scfm). The flowmeters are capable of indicating leakage well within these limits.

Containment isolation valves are designed to incorporate positive barriers to prevent or minimize leakage through the valves under design basis accident conditions. Several isolation valves are pressurized by the penetration pressurization system to prevent leakage. The remaining valves either receive Isolation Seal Water System water or are installed in systems that are part of a closed system within the containment or operate at system pressures greater than the design pressure of 42 psig in the post-accident condition. These design features provide positive means to prevent containment leakage through the containment isolation valves.

The limiting leakage rates from the recirculation heat removal system are judgment values based primarily on assuring that the components could operate without mechanical failure for a period on the order of 200 days after a design basis accident. The test pressure, 350 psig, achieved either by normal system operation or hydrostatically testing, gives an adequate margin over the highest pressure within the system after a design basis accident.

Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions for Type A testing. This program shall be in accordance with the guideline contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995. Type B and C testing shall be implemented in the program in accordance with the requirements of 10 CFR 50, Appendix J, Option A.

The peak calculated containment internal pressure for the design basis loss of coolant accident  $P_a$  is 40 psig.

The maximum allowable containment leak rate,  $L_a$ , at  $P_a$  shall be 0.1% of the containment air weight per day.

Leak Rate acceptance criteria are:

- a. Containment leakage rate acceptance criteria is less than or equal to  $1.0 L_a$ . During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are less than or equal to  $0.6 L_a$  for Type B and Type C tests and less than or equal to  $0.75 L_a$  for Type A tests.

The provisions of Technical Specifications Section 4.0 do not apply to the test frequencies specified in the Containment Leakage Rate Testing Program.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 169 TO FACILITY OPERATING LICENSE NO. DPR-23  
CAROLINA POWER & LIGHT COMPANY  
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261

1.0 INTRODUCTION

On September 12, 1995, the U.S. Nuclear Regulatory Commission (NRC) approved issuance of a revision to 10 CFR Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors" which was subsequently published in the Federal Register on September 26, 1995, and became effective on October 26, 1995. The NRC added Option B "Performance-Based Requirements" to allow licensees to voluntarily replace the prescriptive testing requirements of 10 CFR Part 50, Appendix J, with testing requirements based on both overall leakage rate performance and the performance of individual components.

By letter dated January 31, 1996, the Carolina Power & Light Company (licensee) submitted a request for changes to the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBR), Technical Specifications (TS). The requested changes would revise the TS section 4.4 to allow the use of 10 CFR Part 50, Appendix J, Option B, Performance-Based Containment Leakage Rate Testing. A new TS section 6.12 is proposed to describe the containment leakage rate testing program, adopting 10 CFR Part 50, Appendix J, Option B for type A tests; and 10 CFR Part 50, Appendix J, Option A, for types B and C tests. The Bases would be changed to reflect the proposed changes.

2.0 BACKGROUND

Compliance with 10 CFR Part 50, Appendix J, provides assurance that the primary containment, including those systems and components which penetrate the primary containment, do not exceed the allowable leakage rate specified in the TS 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 begin eliminating requirements marginal to safety which impose a significant regulatory burden. Appendix J of 10 CFR Part 50 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 (RG) 1.163 was developed as a method acceptable to the NRC staff for implementing Option B. RG 1.163 states that the Nuclear Energy Institute (NEI) guidance 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 RG or other implementation document used by a licensee to develop a performance-based leakage rate testing program must be included, by general reference, in the plant TS. The licensee has referenced RG 1.163 in the HBR TS.

RG 1.163 specifies an extension in Type A test frequency to at least one test in 10 years based upon two consecutive successful tests. Type B tests may be extended up to a maximum interval 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 to implement Option B. After some discussion, the staff and NEI agreed on final TS which were attached to a letter from C. Grimes (NRC) to D. Modeen (NEI) 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.

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 TS requirements. Failure to meet an administrative limit requires the licensee to return to the minimum value of the test interval.

Option B requires the licensee to 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.

Through this amendment, specific surveillance requirements related to containment leakage rate testing and the corresponding acceptance criteria and test methods are replaced with a requirement to perform the required testing as required by 10 CFR Part 50, Appendix J, Option B, as modified by approved exemptions, and in accordance with the guidelines contained in RG 1.163, dated September 1995.

### 3.0 EVALUATION

The licensee's January 31, 1996, letter to the NRC proposes to establish a "Containment Leakage Rate Testing Program" and proposes to add this program to the TS. The program references RG 1.163, which specifies a method acceptable to the NRC for complying with Option B. This would require a change to existing TS 4.41, TS 4.42, and TS 4.43, and the addition of the "Containment Leakage Rate Testing Program" to TS Section 6.12. Corresponding Bases were also modified.

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 testing on a performance basis.

The TS changes proposed by the licensee are in compliance with the requirements of Option B and consistent with the guidance of RG 1.163, and the generic TS of the November 2, 1995, letter and are, therefore, acceptable to the staff.

### 4.0 STATE CONSULTATION

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

### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes 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 changes the Surveillance Requirements. The NRC staff has determined that the amendment involves 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 amendment involves no significant hazards consideration, and there has been no public comment on such finding (61 FR 7545). Accordingly, the amendment meets 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 amendment.

### 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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: J. Pulsipher

Date: May 28, 1996