

February 17, 1988

Docket No. 50-325 and 324

Mr. E. E. Utley
Senior Executive Vice President
Power Supply and Engineering & Construction
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602

Dear Mr. Utley:

DISTRIBUTION:

Docket No. 50-261
NRC PDR EAdensam GPA/PA
Local PDR PAnderson ARM/LFMB
PD21 r/f B Mozafari
TMurley ESylvester
OGC-B ACRS (10)
FMiraglia EJordan.
CRossi JPartlow
SVarga TBarnhart (4)
GLainas JPulsipher

- SUBJECTS: 1) EXEMPTION FROM THE REQUIREMENTS OF APPENDIX J FOR BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
2) ISSUANCE OF AMENDMENT NO. 116 TO FACILITY OPERATING LICENSE NO. DPR-71 AND AMENDMENT NO. 144 TO FACILITY OPERATING LICENSE NO. DPR-62 - BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 & 2, REGARDING APPENDIX J REQUIREMENTS (TAC NOS. 66048/66049)

The Nuclear Regulatory Commission, in response to your request dated August 5, 1987, has issued the enclosed Exemption from 10 CFR Part 50, Appendix J, Paragraph III.A.3, and Amendment No. 116 to Facility Operating License No. DPR-71 and Amendment No. 144 to Facility Operating License No. DPR-62 for Brunswick Steam Electric Plant, Units 1 and 2.

We have granted the Exemption from the Type A testing requirements of Appendix J to use American National Standard Institute (ANSI) N45.4-1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors," which requires that the containment leakage calculations be performed using either the Point-to-Point or the Total Time method. The Exemption will allow Carolina Power & Light to use the Mass-Point technique for calculating containment leakage rates. The bases for this Exemption are discussed in the enclosed Exemption and Safety Evaluation. The Exemption has been forwarded to the Office of the Federal Register for publication. The enclosed Environmental Assessment and Finding of No Significant Impact has been published in the Federal Register.

The amendments change the Technical Specifications (TS) to maintain consistency with Appendix J requirements. Specifically, surveillance requirement 4.6.1.2 has been changed to reference the Mass-Point method of calculating leakage rates, as described in ANSI/ANS 56.8-1981. The associated Bases section 3/4.6.1.2 was modified to incorporate a description of the Exemption to Appendix J.

The NRC staff has concluded that these amendments are acceptable, with the condition that minimum test duration is 24 hours. The enclosed copy of the

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Safety Evaluation is applicable to the Exemption and the amendments. The Notice of Issuance will be included in the Commissions Bi-Weekly Federal Register.

Sincerely,

Ernest D. Sylvester, Project Manager
Project Directorate II-1
Division of Reactor Projects 1/11

Enclosures:

1. Exemption
2. Amendment No.116 to
License No. DPR-71
3. Amendment No.144 to
License No. DPR-62
4. Safety Evaluation

cc: w/enclosures:
See next page

*See previous concurrence

LA:PD21:DRPR
PAnderson*
1/12/88

PE:PD21:DRPR
BMozafari*
1/12/88

PM:PD21:DRPR
ESylvester*
1/12/88

PD:PD21:DRPR
EAdensam
2/16/88

SPLB
JCraig*
1/14/88

BCB for

Safety Evaluation is applicable to the Exemption and the amendments. The Notice of Issuance will be included in the Commissions Bi-Weekly Federal Register.

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Ernest D. Sylvester, Project Manager
Project Directorate II-1
Division of Reactor Projects 1/11

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1. Exemption
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Sincerely,

Ernest D. Sylvester, Project Manager
Project Directorate II-1
Division of Reactor Projects 1/11

Enclosures:

1. Exemption
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ESylvester
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PD: PD21: DRPR
EAdensam
1/ /88


SPLB
JCraig
1/14/88

Mr. E. E. Utley
Carolina Power & Light Company

Brunswick Steam Electric Plant
Units 1 and 2

cc:

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Vice President
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Southport, North Carolina 28461

Regional Administrator, Region II
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Mr. Dayne H. Brown, Chief
Radiation Protection Branch
Division of Facility Services
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Raleigh, North Carolina 27603-2008

CAROLINA POWER & LIGHT COMPANY, et al.

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 116
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 August 5, 1987, 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. 116, 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 of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Elinor G. Adensam, Director
Project Directorate II-1
Division of Reactor Projects I/II

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 17, 1988

PA
LA: PD21: DRPR
PAnderson/dsf
1/17/88

BKM
PE: PD21: DRPR
BMozafari
1/17/88

SOS
PM: PD21: DRPR
ESylvester
1/17/88

SH Lewis
OGC-B *SH*
S H Lewis
1/23/88

BCB for
D: PD21: DRPR
EAdensam
2/16/88

ATTACHMENT TO LICENSE AMENDMENT NO. 116

FACILITY OPERATING LICENSE NO. DPR-71

DOCKET NO. 50-325

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

Remove Pages

3/4 6-3

B 3/4 6-1

Insert Pages

3/4 6-3

B 3/4 6-1

3/4.6 CONTAINMENT SYSTEMS

BASES

3/4.6.1 PRIMARY CONTAINMENT

3/4.6.1.1 PRIMARY CONTAINMENT INTEGRITY

Primary CONTAINMENT INTEGRITY ensures that the release of radioactive materials from the containment atmosphere will be restricted to those leakage paths and associated leak rates assumed in the accident analyses. This restriction, in conjunction with the leakage rate limitation, will limit the site boundary radiation doses to within the limits of 10 CFR Part 100 during accident conditions.

3/4.6.1.2 PRIMARY CONTAINMENT LEAKAGE

The limitations on primary containment leakage rates ensure that the total containment leakage volume will not exceed the value assumed in the accident analyses at the peak accident pressure of 49 psig, P_a . As an added conservatism, the measured overall integrated leakage rate is further limited to less than or equal to $0.75 L_a$ or $0.75 L_t$, as applicable, during performance of the periodic tests to account for possible degradation of the containment leakage barriers between leakage tests.

Operating experience with the main steam line isolation valves has indicated that degradation has occasionally occurred in the leak tightness of the valves; therefore, the special requirement for testing these valves.

Exemptions from the requirements of 10 CFR Part 50 have been granted for main steam isolation valve leak testing, testing of airlocks after each opening, and leakage calculation methods.

Appendix J, paragraph III.A.3 requires that all Type A (Containment Integrated Leak Rate) tests be performed in accordance with ANSI N45.4-1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors." ANSI N45.4-1972 requires that leakage calculations be performed using the Point-to-Point or Total Time method. ANSI N45.4-1972 has been revised to a new standard, ANSI/ANS 56.8-1981, "Containment System Leakage Testing," which incorporates the Mass-Point method for leakage calculations. Type A tests will be performed in conformance with ANSI N45.4-1972 but will use the Mass-Point method for calculation of leakage rates as described in ANSI/ANS 56.8-1981.

3/4.6.1.3 PRIMARY CONTAINMENT AIR LOCKS

The limitations on closure and leak rate for the containment air locks are required to meet the restrictions on PRIMARY CONTAINMENT INTEGRITY and leak rate given in Specifications 3.6.1.1 and 3.6.1.2. The specification makes allowances for the fact that there may be long periods of time when the air locks will be in a closed and secured position during reactor operation.

CONTAINMENT SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

- c. The leakage rate to less than or equal to 11.5 scf per hour for any one main steam line isolation valve,

prior to increasing reactor coolant system temperature above 212°F.

SURVEILLANCE REQUIREMENTS

4.6.1.2 The primary containment leakage rates shall be determined in conformance with the criteria specified in Appendix J of 10 CFR 50 using the methods and provisions of ANSI N45.4-1972, except that leakage rates for Type A tests shall be calculated using the Mass-Point method as specified in ANSI/ANS 56.8-1981*. The primary containment leakage rates shall be demonstrated at the following test schedule:

- a. Three Type A Overall Integrated Containment Leakage Rate tests shall be conducted at 40 + 10 month intervals during shutdown at P_a , 49 psig, or P_c , 25 psig, during each 10-year service period. The third test of each set shall be conducted during the shutdown for the 10-year plant inservice inspection.
- b. If any periodic Type A test fails to meet either $0.75 L_a$ or $0.75 L_c$, the test schedule for subsequent Type A tests shall be reviewed and approved by the Commission. If two consecutive Type A tests fail to meet $0.75 L_a$ or $0.75 L_c$, a Type A test shall be performed at each plant shutdown for refueling or every 18 months, whichever occurs first, until two consecutive Type A tests meet $0.75 L_a$ or $0.75 L_c$, at which time the above test schedule may be resumed.
- c. The accuracy of each Type A test shall be verified by a supplemental test which:
 1. Confirms the accuracy of the test by verifying that the difference between the supplemental data and the Type A test data is within $0.25 L_a$ or $0.25 L_c$.
 2. Has duration sufficient to establish accurately the change in leakage rate between the Type A test and the supplemental test.
 3. Requires the quantity of gas injected into the containment or bled from the containment during the supplemental test to be equivalent to at least 25 percent of the total measured leakage rate at P_a , 49 psig, or P_c , 25 psig.

*Exemption from Appendix J of 10CFR50.

CAROLINA POWER & LIGHT COMPANY, et al.

DOCKET NO. 50-324

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 144
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 August 5, 1987, 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. 144, 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 of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Elinor G. Adensam, Director
Project Directorate II-1
Division of Reactor Projects I/II

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 17, 1988

PA
LA:PD21:DRPR
PAnderson
1/12/88

BM
PE:PD21:DRPR
BMozaferi
1/12/88

ES
PM:PD21:DRPR
ESylvester
1/12/88

LH
OGC-B
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1/25/88

BCB
D:PD21:DRPR
EAdensam
1/16/88

ATTACHMENT TO LICENSE AMENDMENT NO. 144

FACILITY OPERATING LICENSE NO. DPR-62

DOCKET NO. 50-324

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

Remove Pages

3/4 6-3

B 3/4 6-1

Insert Pages

3/4 6-3

B 3/4 6-1

3/4.6 CONTAINMENT SYSTEMS

BASES

3/4.6.1 PRIMARY CONTAINMENT

3/4.6.1.1 PRIMARY CONTAINMENT INTEGRITY

Primary CONTAINMENT INTEGRITY ensures that the release of radioactive materials from the containment atmosphere will be restricted to those leakage paths and associated leak rates assumed in the accident analyses. This restriction, in conjunction with the leakage rate limitation, will limit the site boundary radiation doses to within the limits of 10 CFR Part 100 during accident conditions.

3/4.6.1.2 PRIMARY CONTAINMENT LEAKAGE

The limitations on primary containment leakage rates ensure that the total containment leakage volume will not exceed the value assumed in the accident analyses at the peak accident pressure of 49 psig, P_a . As an added conservatism, the measured overall integrated leakage rate is further limited to less than or equal to $0.75 L_a$ or $0.75 L_t$, as applicable, during performance of the periodic tests to account for possible degradation of the containment leakage barriers between leakage tests.

Operating experience with the main steam line isolation valves has indicated that degradation has occasionally occurred in the leak tightness of the valves; therefore, the special requirement for testing these valves.

Exemptions from the requirements of 10 CFR Part 50 have been granted for main steam isolation valve leak testing, testing of airlocks after each opening, and leakage calculation methods.

Appendix J, paragraph III.A.3 requires that all Type A (Containment Integrated Leak Rate) tests be performed in accordance with ANSI N45.4-1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors." ANSI N45.4-1972 requires that leakage calculations be performed using the Point-to-Point or Total Time method. ANSI N45.4-1972 has been revised to a new standard, ANSI/ANS 56.8-1981, "Containment System Leakage Testing," which incorporates the Mass-Point method for leakage calculations. Type A tests will be performed in conformance with ANSI N45.4-1972 but will use the Mass-Point method for calculation of leakage rates as described in ANSI/ANS 56.8-1981.

3/4.6.1.3 PRIMARY CONTAINMENT AIR LOCKS

The limitations on closure and leak rate for the containment air locks are required to meet the restrictions on PRIMARY CONTAINMENT INTEGRITY and leak rate given in Specifications 3.6.1.1 and 3.6.1.2. The specification makes allowances for the fact that there may be long periods of time when the air locks will be in a closed and secured position during reactor operation.

CONTAINMENT SYSTEMS

LIMITING CONDITION FOR OPERATION (Continued)

ACTION (Continued)

- c. The leakage rate to less than or equal to 11.5 scf per hour for any one main steam line isolation valve,

prior to increasing reactor coolant system temperature above 212°F.

SURVEILLANCE REQUIREMENTS

4.6.1.2 The primary containment leakage rates shall be determined in conformance with the criteria specified in Appendix J of 10 CFR 50 using the methods and provisions of ANSI N45.4-1972, except that leakage rates for Type A tests shall be calculated using the Mass-Point method as specified in ANSI/ANS 56.8-1981*. The primary containment leakage rates shall be demonstrated at the following schedule:

- a. Three Type A Overall Integrated Containment Leakage Rate tests shall be conducted at 40 ± 10 month intervals during shutdown at P_a , 49 psig, or P_t , 25 psig, during each 10-year service period. The third test of each set shall be conducted during the shutdown for the 10-year plant inservice inspection.
- b. If any periodic Type A test fails to meet either $0.75 L_a$ or $0.75 L_t$, the test schedule for subsequent Type A tests shall be reviewed and approved by the Commission. If two consecutive Type A tests fail to meet $0.75 L_a$ or $0.75 L_t$, a Type A test shall be performed at each plant shutdown for refueling or every 18 months, whichever occurs first, until two consecutive Type A tests meet $0.75 L_a$ or $0.75 L_t$, at which time the above test schedule may be resumed.
- c. The accuracy of each Type A test shall be verified by a supplemental test which:
 1. Confirms the accuracy of the test by verifying that the difference between the supplemental data and the Type A test data is within $0.25 L_a$ or $0.25 L_t$.
 2. Has duration sufficient to establish accurately the change in leakage rate between the Type A test and the supplemental test.
 3. Requires the quantity of gas injected into the containment or bled from the containment during the supplemental test to be equivalent to at least 25 percent of the total measured leakage at P_a , 49 psig or P_t , 25 psig.

*Exemption from Appendix J of 10CFR50.

UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of :

CAROLINA POWER & LIGHT COMPANY

Brunswick Steam Electric Plant,
Units 1 and 2}

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Docket No. 50-325/324

EXEMPTION

I.

Carolina Power & Light Company (the licensee) is the holder of Facility Operating License Nos. DPR-71 and DPR-62, which authorize operation of the Brunswick Steam Electric Plant, Units 1 and 2. The licenses provide, among other things, that the facility is subject to all rules, regulations and Orders of the Nuclear Regulatory Commission (the Commission) now or hereafter in effect.

The facilities are General Electric boiling water reactors located at the licensee's site in Southport, North Carolina.

II.

Paragraph III.A.3 of Appendix J to 10 CFR Part 50 requires that all Type A Containment Integrated Leak Rate tests be performed in accordance with American National Standard Institute (ANSI) N45.4-1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors." ANSI N45.4 requires that leakage calculations be performed using the Total Time method or the Point-to-Point method.

By letter dated August 5, 1987, the licensee requested an exemption from 10 CFR Part 50, Appendix J, Paragraph III.A.3, regarding Type A Containment

Integrated Leak Rate Test calculations. Specifically, the licensee requested an exemption to permit the use of the Mass-Point method (as provided in ANSI/ANS 56.8-1981, paragraph 5), rather than the Total Time method described in ANSI N45.4-1972, paragraph 7.9. In support of its request, the licensee notes that the Mass-Point method is a newer and more accurate method of calculating containment leakage. The licensee also notes that utilizing the Total Time method produces results that are less reliable than results by the Mass-Point method. The licensee has, therefore, requested the Exemption to enable use of the Mass-Point method.

The acceptability of the exemption request is addressed below. More details are contained in the Commission's related Safety Evaluation issued concurrently with this Exemption.

III.

The licensee's exemption request under consideration involves the Type A testing requirements of Appendix J for containments. As indicated in the licensee's letter of August 5, 1987, until about 1976 containment leakage rate calculations were performed using only the Point-to-Point or the Total Time methods in accordance with ANSI N45.4-1972. In 1976, the NRC staff unofficially recognized the merits of a newer method, known as the Mass-Point method. ANSI N45.4-1972 has since been revised to incorporate the Mass-Point method into ANSI/ANS 56.8-1981. The staff anticipates publishing for comment in the near future a proposed amendment to Appendix J that would permit the use of the Mass-Point method.

The licensee submits that that the more accurate technique provides increased confidence in the integrity of the containment.

In addition, the licensee provided a determination that special circumstances exist under 10 CFR 50.12(a). The rule specifies particular methods for calculating leakage to assure that accurate and conservative methods are used to assess the results of containment leak rate tests. As discussed above, the licensee has determined that this underlying purpose is achieved with use of the more accurate Mass-Point method. Therefore, they concluded that application of the regulation in these particular circumstances is not necessary to achieve the underlying purpose of the rule. The staff agrees with the licensee's conclusion and has determined that, under 10 CFR 50.12(a)(2)(ii), special circumstances exist. Based on the above discussion, the licensee's request for exemption (allowing the Mass-Point technique for calculating containment leakage rate) from the requirements of Appendix J is granted for Brunswick Units 1 and 2, with the condition that the test be conducted over a period of at least 24 hours.

IV.

The Commission has determined that, pursuant to 10 CFR 50.12, this exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. The Commission has further determined that special circumstances, as provided in 10 CFR 50.12(a)(2)(ii), are present, justifying the Exemption. Namely, application of the regulation in the particular circumstances is not necessary to

achieve its underlying purpose, which is to ensure that accurate and conservative methods are used to assess the results of containment leak rate tests. The Mass-Point method, which provides accurate results, has been a widely used method of performing leak rate calculations and satisfies the underlying purpose of the rule.

Accordingly, the Commission hereby grants an Exemption from Paragraph III.A.3 of Appendix J to 10 CFR Part 50 to allow use of the Mass-Point method in performing leakage rate calculations associated with Containment Integrated leakage rate tests, provided that the minimum test duration is 24 hours. Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this Exemption will have no significant impact on the environment (51 FR 18296).

This Exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Steven A. Varga, Director
Division of Reactor Projects I-II
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 17th day of February 1988.

*See previous concurrence page

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PAnderson
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SVarga
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achieve its underlying purpose, which is to ensure that accurate and conservative methods are used to assess the results of containment leak rate tests. The Mass-Point method, which provides accurate results, has been a widely used method of performing leak rate calculations and satisfies the underlying purpose of the rule.

Accordingly, the Commission hereby grants an Exemption from Paragraph III.A.3 of Appendix J to 10 CFR Part 50 to allow use of the Mass-Point method in performing leakage rate calculations associated with Containment Integrated Leakage Rate Tests, provided that the minimum test duration is 24 hours.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this Exemption will have no significant impact on the environment (51 FR 18296).

This Exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Steven A. Varga, Director
Division of Reactor Projects I-II
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 17th day of February 1987.

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PAnderson
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SH Lewis
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DR2A: DRPR
GLapas
~~12/12/87~~

D: DRPR
SVarga
~~12/12/87~~



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO APPENDIX J EXEMPTION REQUESTS

AND AMENDMENT NO. 116 TO FACILITY LICENSE NO. DPR-71

AND AMENDMENT NO. 144 TO FACILITY LICENSE NO. DPR-62

CAROLINA POWER & LIGHT COMPANY

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1 AND 2

DOCKET NOS. 50-325 AND 50-324

1.0 INTRODUCTION

By letter dated August 5, 1987, the licensee requested an exemption from 10 CFR Part 50, Appendix J, Paragraph III.A.3, which requires that all Containment Integrated Leakage Rate Tests (CILRTs) be performed in accordance with the American National Standard Institute (ANSI) N45.4-1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors." ANSI N45.4-1972 requires that leakage rate calculations be performed using either the Total Time method or the Point-to-Point method. The licensee's requested exemption would allow use of the Mass-Point method to calculate containment leakage rate. The Mass-Point method is described in a more recent standard, ANSI/ANS 56.8-1981, "Containment System Leakage Testing Requirements." Also included in the licensee's submittal was a request to change the Technical Specifications (TS), specifically surveillance requirement 4.6.1.2 and the associated bases. The changes are needed for consistency between Appendix J and the TS. The staff's review of this request for exemption and amendment follows.

2.0 EVALUATION

The licensee indicated that in 1976 the NRC staff unofficially recognized the merits of the Mass-Point technique and that this method was the recommended method to use. On this basis, the licensee has performed calculations using the Mass-Point method. The licensee was recently informed by the staff that, with regard to the Mass-Point method, this method has not been incorporated into the current provisions of 10 CFR Part 50, Appendix J, and, therefore, its use requires an exemption. In response to this staff position, the licensee has requested an Appendix J exemption. The licensee has stated, in support of the application for exemption from Appendix J, that the Mass-Point method is a more accurate method of calculating containment leakage.

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The Mass-Point method has been recognized by the professional community as superior to the two other methods, Point-to-Point and Total Time, which are referenced in ANSI N45.4-1972 and endorsed by the present regulations. The Mass-Point method calculates the air mass at each point in time, and plots it against time. A linear regression line is plotted through the mass-time points using a least square fit. The slope of this line, divided by its intercept and multiplied by an appropriate constant, is the leakage rate. The superiority of the Mass-Point method becomes apparent when it is compared with the other methods. With the Total Time method, a series of leakage rates are calculated on the basis of air mass differences between an initial datum point and each individual datum point thereafter. If for any reason (e.g, instrument error, lack of temperature equilibrium, ingassing, or outgassing), the initial datum point is not accurate, the results of the test will be affected. In the Point-to-Point method, the leak rates are based on the mass difference between each pair of consecutive points which are then averaged to yield a single leakage rate estimate. Mathematically this can be shown to be the difference between the air mass at the beginning of the test and the air mass at the end of the test, expressed as a percentage of the containment air mass.

It follows from the above that the Point-to-Point method ignores any mass readings taken during the test; and, thus, the leakage rate is calculated on the basis of the difference in mass between two measurements taken at the beginning and at the end of the test, which are 24 hours apart.

ANSI/ANS 56.8-1981, which was intended to replace ANSI N45.4-1972, specifies the use of the Mass-Point method, to the exclusion of the two older methods. The staff anticipates publishing for comment in the near future a proposed amendment to Appendix J that would permit the use of the Mass-Point method.

In addition to the method of calculation, consideration of the length of the test should also be included in the overall program. In accordance with Section 7.6 of ANSI N45.4-1972, a test duration less than 24 hours is only allowed if approved by the NRC staff, and the only currently approved methodology for such a test is contained in Bechtel Topical Report BN-TOP-1, Revision 1, "Testing Criteria for Integrated Leakage Rate Testing of Primary Containment Structures for Nuclear Power Plants," dated November 1, 1972. This approach only allows use of the Total Time method. Therefore, the staff will condition the exemption to require a minimum test duration of 24 hours when the Mass-Point method is used.

Information identifying the special circumstances for granting this exemption pursuant to 10 CFR 50.12 was also provided in the licensee's letter. The purpose of Appendix J to 10 CFR Part 50 is to assure that containment leak tight integrity can be verified periodically throughout the service lifetime in order to maintain containment leakage within the limit specified in the facility TS. The underlying purpose of the rule, in specifying particular methods for calculating leakage rates, is to assure that accurate and conservative methods are used to assess the results of containment leak rate tests. The staff has determined that the Mass Point method is an acceptable method for calculation of containment leakage rate and satisfies the purpose of the rule.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in surveillance requirements. The 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 this amendment involves no significant hazards consideration, and there has been no public comment on such finding. Accordingly, this 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 this amendment.

4.0 CONCLUSION

Based on the above evaluation, the Commission's staff finds that the licensee's proposed exemption from 10 CFR Part 50, Paragraph III.A.3 of Appendix J, to allow use of the Mass-Point method as requested in the submittal dated August 5, 1987, is acceptable with the condition that the minimum test duration is 24 hours. The exemption applies only to the method of calculating leakage by use of the Mass-Point method and not to any other aspects of the tests.

The Commission made a proposed determination that the amendment involves no significant hazards consideration, which was published in the Federal Register on December 16, 1987 at 52 FR 47776 and consulted with the State of North Carolina. No public comments or requests for hearing were received and the State of North Carolina did not have any comments.

The staff has concluded, based on the consideration 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, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and the security nor to the health and safety of the public.

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Dated: February 17, 1988