

DEC 15 1975

Docket No. 50-324

Carolina Power & Light Company  
ATTN: Mr. J. A. Jones  
Executive Vice President  
336 Fayetteville Street  
Raleigh, North Carolina 27602

Gentlemen:

The Commission has requested the Federal Register to publish the enclosed Notice of Proposed Issuance of Amendment to Facility License No. DPR-62 for the Brunswick Steam Electric Plant, Unit No. 2. The proposed amendment includes a change to the Technical Specifications based on our letter to you dated September 23, 1975, and your response dated October 13, 1975.

This amendment would revise the Technical Specifications to add requirements that would limit the period of time operation can be continued with immovable control rods that would have control rod drive mechanism collet housing failures.

A copy of our proposed license amendment with proposed changes to the Technical Specifications and Bases is also enclosed.

Sincerely,

Original signed by R. A. Purple

Robert A. Purple, Chief  
Operating Reactors Branch #1  
Division of Reactor Licensing

Enclosures:

1. Federal Register Notice
2. Proposed Amendment w/Proposed Technical Specification changes and Bases

cc w/enclosures:  
See next page

OFFICE ▶	RL:ORB#1 <i>CMTrammell</i>	RL:ORB#2 <i>RSilver</i>	OELD <i>APurple</i>	RL:ORB#1 <i>APurple</i>		
SURNAME ▶	CMTrammell:mer	RSilver		RAPurple		
DATE ▶	12/11/75	12/17/75	11/12/75	12/15/75		

DEC 15 1975

cc w/enclosures:

Richard E. Jones, Esquire  
Carolina Power & Light Company  
336 Fayetteville Street  
Raleigh, North Carolina 27602

George F. Trowbridge, Esquire  
Shaw, Pittman, Potts & Trowbridge  
910 17th Street, NW.  
Washington, D.C. 20006

John J. Burney, Jr., Esquire  
Burney, Burney, Sperry & Barefoot  
110 North Fifth Avenue  
Wilmington, North Carolina 28401

Ms. Janet Godwin, President  
Project Environment  
202 Bedford Road East  
Wilmington, North Carolina 28401

Southport - Brunswick County Library  
109 W. Moore Street  
Southport, North Carolina 28461

Mr. W. A. Kopp, Jr.  
Chairman, Board of County  
Commissioners of Brunswick County  
Bolivia, North Carolina 28422

Office of Intergovernmental  
Relations  
116 West Jones Street  
Raleigh, North Carolina 27603

Mr. Dave Hopkins  
Environmental Protection Agency  
1421 Peachtree Street, NE.  
Atlanta, Georgia 30309

CAROLINA POWER AND LIGHT COMPANY

DOCKET NO. 50-324

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 2

PROPOSED AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.  
License No. DPR-62

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. 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; and
  - B. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.
2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the attachment to this license amendment and Paragraph 2.C.(2) of Facility License No. DPR-62 is hereby amended to read as follows:

"2.C.(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, as revised by issued changes thereto through Change No. ."

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Karl R. Goller, Assistant Director  
for Operating Reactors  
Division of Reactor Licensing

Attachment:  
Change No.        to the  
Technical Specifications

Date of Issuance:

ATTACHMENT TO PROPOSED LICENSE AMENDMENT  
PROPOSED CHANGE TO THE TECHNICAL SPECIFICATIONS  
FACILITY OPERATING LICENSE NO. DPR-62  
DOCKET NO. 50-324

Revise Appendix A as follows:

Remove pages: 3.3-1/3.3-2  
3.3-9/3.3-10

Insert new pages: 3.3-1/3.3-1a  
3.3-1b/3.3-2  
3.3-9/3.3-10  
3.3-10a/3.3-10b

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LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
<p>3.3 <u>Reactivity Control</u></p> <p><u>Applicability:</u></p> <p>Applies to the operational status of the control rod system.</p> <p><u>Objective:</u></p> <p>To assure the ability of the control rod system to control reactivity.</p> <p><u>Specification:</u></p> <p>A. <u>Reactivity Limitations</u></p> <p>1. <u>Reactivity margin - core loading</u></p> <p>The core loading shall be limited to that which can be made subcritical in the most reactive condition during the operating cycle with the strongest operable control rod in its full-out position and all other operable rods fully inserted.</p>	<p>4.3 <u>Reactivity Control</u></p> <p><u>Applicability:</u></p> <p>Applies to the surveillance requirements of the control rod system.</p> <p><u>Objective:</u></p> <p>To verify the ability of the control rod system to control reactivity.</p> <p><u>Specification:</u></p> <p>A. <u>Reactivity Limitations</u></p> <p>1. <u>Reactivity margin - core loading</u></p> <p>Sufficient control rods shall be withdrawn following a refueling outage when core alterations were performed to demonstrate with a margin of 0.28 percent <math>\Delta k</math> that the core can be made subcritical at any time in the subsequent fuel cycle with the strongest operable control rod fully withdrawn and all other operable rods fully inserted.</p>

## LIMITING CONDITIONS FOR OPERATION

## SURVEILLANCE REQUIREMENTS

2. Reactivity margin - inoperable control rods

- a. Control rod drives which cannot be moved with control rod drive pressure shall be considered inoperable. If a partially or fully withdrawn control rod drive cannot be moved with drive or scram pressure, the reactor shall be brought to the Cold Shutdown Condition within 24 hours and shall not be started unless (1) investigation has demonstrated that the cause of the failure is not a failed control rod drive mechanism collet housing, and (2) adequate shutdown margin has been demonstrated as required by Specification 4.3.A.2.b. If investigation demonstrates that the cause of the control rod drive failure is a cracked collet housing, or if this possibility cannot be ruled out, the reactor shall not be started until the affected control rod drive has been replaced or repaired.
- b. The control rod directional control valves for inoperable control rods shall be disarmed electrically and the control rods shall be in such positions that Specification 3.3.A.1 is met.

2. Reactivity margin - inoperable control rods

- a. Each partially or fully withdrawn operable control rod shall be exercised one notch at least once each week when operating above 20% power. In the event power operation is continuing with three or more inoperable control rods, this test shall be performed at least once each day when operating above 20% power.

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LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
<p>3.3.A <u>Reactivity Limitations</u> (Cont'd)</p> <p>c. Control rod drives which are fully inserted and electrically disarmed shall not be considered inoperable.</p> <p>d. Control rods with scram times greater than those permitted by Specification 3.3.C.3 are inoperable, but if they can be inserted with control rod drive pressure they need not be disarmed electrically.</p> <p>e. During reactor power operation, the number of inoperable control rods shall not exceed eight. In addition, during reactor power operation no more than one control rod in any 5 x 5 array may be inoperable (at least 4 operable control rods must separate any 2 inoperable ones). Specification 3.3.A.1 must be met at all times.</p>	<p>4.3.A <u>Reactivity Limitations</u> (Cont'd)</p> <p>b. When it is initially determined that a control rod is incapable of normal insertions, an attempt to fully insert the control rod shall be made. If the control rod cannot be fully inserted, a shutdown margin test shall be made to demonstrate that the core can be made subcritical for any reactivity condition during the remainder of the operating cycle with the analytically determined, highest worth control rod capable of withdrawal, fully withdrawn, and all other control rods capable of insertion fully inserted.</p>
<p>B. <u>Control Rods</u></p> <p>1. Each control rod shall be coupled to its drive or completely inserted and the control rod directional control valves disarmed electrically. This requirement does not apply in the refuel condition when the reactor is vented. Two control rod drives may be removed as long as Specification 3.3.A.1 is met.</p>	<p>B. <u>Control Rods</u></p> <p>1. The coupling integrity shall be verified for each withdrawn control rod as follows:</p> <p>a. When the rod is withdrawn the first time subsequent to each refueling outage or after maintenance, observe discernible response of the nuclear instrumentation. However, for initial rods when response is not discernible, subsequent exercising of these rods after the reactor is critical shall be performed to verify instrumentation response.</p>

BASES:3.3 and 4.3 Reactivity ControlA. Reactivity Limitation

1. The core reactivity limitation is a restriction to be applied principally to the design of new fuel which may be loaded in the core or into a particular refueling pattern. Satisfaction of the limitation can only be demonstrated at the time of loading and must be such that it will apply to the entire subsequent fuel cycle. The generalized form is that the reactivity of the core loading will be limited so the core can be made subcritical by at least  $R + 0.28$  percent  $\Delta k$  at the time of the test, with the strongest control rod fully withdrawn and all others fully inserted. The value of  $R$  in percent  $\Delta k$  is the amount by which the core reactivity, at any time in the operating cycle, is calculated to be greater than at the time of the check; i.e., the initial loading.  $R$  must be a positive quantity or zero. A core which contains temporary control or other burnable neutron absorbers may have a reactivity characteristic which increases with core lifetime, goes through a maximum and then decreases thereafter.

The value of  $R$  is the difference between the calculated core reactivity at the beginning of the operating cycle and the calculated value of core reactivity any time later in the cycle where it would be greater than at the beginning. A new value of  $R$  must be determined for each fuel cycle.

The 0.28 percent  $\Delta k$  in the expression  $R + 0.28$  percent  $\Delta k$  is provided as a finite, demonstrable, subcriticality margin. This margin is demonstrated by full withdrawal of the strongest rod and partial withdrawal of an adjacent rod to a position calculated to insert at least  $R + 0.28$  percent  $\Delta k$  in reactivity. Observa-

BASES:3.3.A.1 and 4.3.A.1 Reactivity Limitation (Cont'd)

tion of subcriticality in this condition assures subcriticality with not only the strongest rod fully withdrawn but at least an  $R \pm 0.28$  percent  $\Delta k$  margin beyond this.

2. Reactivity margin - inoperable control rods

Specification 3.3.A.2 requires that a rod be taken out of service if it cannot be moved with drive pressure. If the rod is fully inserted and then disarmed electrically\*, it is in a safe position of maximum contribution to shutdown reactivity. If it is disarmed electrically in a non-fully inserted position, that position shall be consistent with the shutdown reactivity limitation stated in Specification 3.3.A.1. This assures that the core can be shut down at all times with the remaining control rods assuming the strongest operable control rod does not insert. An allowable pattern for control rods valved out of service, which shall meet this Specification, will be determined and made available to the operator. The number of rods permitted to be inoperable could be many more than the eight allowed by the Specification, particularly late in the operation cycle; however, the occurrence of more than eight could be indicative of a generic control rod drive problem and the reactor will be shut down. Also, if damage within the control rod drive mechanism and in particular, cracks in drive internal housings, cannot be ruled out, then a generic problem affecting a number of drives cannot be ruled out. Circumferential cracks resulting from

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\* To disarm the drive electrically, four Amphenol-type plug connectors are removed from the drive insert and withdrawal solenoids rendering the rod incapable of withdrawal. This procedure is equivalent to valving out the drive and is preferred because, in this condition, drive water cools and minimizes encrusted accumulations in the drive. Electrical disarming does not eliminate position indication.

BASES:3.3.A.1 and 4.3.A.1 Reactivity Limitation (Cont'd)

stress assisted intergranular corrosion have occurred in the collet housing of drives at several BWRs. This type of cracking could occur in a number of drives and if the cracks propagated until severance of the collet housing occurred, scram could be prevented in the affected rods. Limiting the period of operation with a potentially severed collet housing will assure that the reactor will not be operated with a large number of rods with failed collet housings.

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UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-324

CAROLINA POWER & LIGHT COMPANY

NOTICE OF PROPOSED ISSUANCE OF AMENDMENT+  
TO FACILITY OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to Facility Operating License No. DPR-62 issued to Carolina Power & Light Company (the licensee) for operation of the Brunswick Steam Electric Plant, Unit No. 2 (the facility) located in Brunswick County, North Carolina.

This amendment would revise the Technical Specifications to add requirements that would limit the period of time operation can be continued with immovable control rods that could have control rod mechanism collet housing failures.

Prior to issuance of the proposed license amendment , the Commission will have made the findings required by the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations.

By JAN 22 1976 , the licensee may file a request for a hearing and any person whose interest may be affected by this proceeding may file a request for a hearing in the form of a petition for leave to intervene with respect to the issuance of this amendment to the subject facility operating license. Petitions for leave to intervene must be filed under oath or affirmation in accordance with the provisions of Section 2.714 of 10 CFR Part 2 of the Commission's regulations. A petition for leave to intervene must set forth the interest of the petitioner in the proceeding,

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how that interest may be affected by the results of the proceeding, and the petitioner's contentions with respect to the proposed licensing action. Such petitions must be filed in accordance with the provisions of this FEDERAL REGISTER notice and Section 2.714, and must be filed with the Secretary of the Commission, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Docketing and Service Section, by the above date. A copy of the petition and/or request for a hearing should be sent to the Executive Legal Director, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555 and to Richard E. Jones, Esq., Carolina Power & Light Company, 336 Fayetteville Street, Raleigh, North Carolina 27602, attorney for the licensee.

A petition for leave to intervene must be accompanied by a supporting affidavit which identifies the specific aspect or aspects of the proceeding as to which intervention is desired and specifies with particularity the facts on which the petitioner relies as to both his interest and his contentions with regard to each aspect on which intervention is requested. Petitions stating contentions relating only to matters outside the Commission's jurisdiction will be denied.

All petitions will be acted upon by the Commission or licensing board, designated by the Commission or by the Chairman of the Atomic Safety and Licensing Board Panel. Timely petitions will be considered to determine whether a hearing should be noticed or another appropriate order issued regarding the disposition of the petitions.

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In the event that a hearing is held and a person is permitted to intervene, he becomes a party to the proceeding and has a right to participate fully in the conduct of the hearing. For example, he may present evidence and examine and cross-examine witnesses.

For further details with respect to this action, see the Commission's letter to the licensee dated September 23, 1975, and the attached proposed Technical Specifications and Safety Evaluation by the Commission's staff and the licensee's letter dated October 13, 1975, which are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at the Southport-Brunswick County Library, 109 W. Moore Street, Southport, North Carolina 28461. The license amendment and Safety Evaluation may be inspected at the above locations and a copy may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Reactor Licensing.

Dated at Bethesda, Maryland, DEC 15 1975

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by R. A. Purple

Robert A. Purple, Chief  
Operating Reactors Branch #1  
Division of Reactor Licensing

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SURNAME ▶	CMTammell:mer	RSilver	RLW	RPurple		
DATE ▶	12/1/75	12/1/75	12/1/75	12/1/75		