

September 8, 1976

Docket No. 50-325

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

Gentlemen:

ISSUANCE OF FACILITY OPERATING LICENSE FOR BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

The Nuclear Regulatory Commission has issued the enclosed Facility Operating License No. DPR-71 to Carolina Power & Light Company. As indicated in the enclosed documents entitled, "Negative Declaration Regarding Issuance of a Limited Facility License DPR-71, Brunswick Steam Electric Plant, Unit 1," and "Environmental Impact Appraisal of Issuance of Fuel Loading, Criticality and Low-Power Testing Operating License for Brunswick Steam Electric Plant, Unit 1," and "Environmental Appraisal of a Possible Delay in Construction of Cooling Towers at Brunswick Steam Electric Plant, Units 1 and 2", the Commission has concluded that an environmental impact statement for this particular action is not warranted because there will be no environmental impact significantly affecting the quality of the human environment. Accordingly, License No. DPR-71 authorizes the Carolina Power & Light Company to operate the Brunswick Steam Electric Plant, Unit 1, at a reactor core power level of 24.36 megawatts thermal, or one percent of the core thermal power rating of 2436 megawatts, for testing purposes.

A related notice, which is being forwarded to the Office of the Federal Register for filing and publication, is provided for your information.

Two signed originals of Amendment No. 5 to Indemnity Agreement No. B-71, which covers the activities authorized under Facility Operating License No. DPR-71 are enclosed. Please sign and return one copy to this office.

Sincerely,

Original signed by
S. A. Varga, Chief
Light Water Reactors Branch 4
Division of Project Management

See next page

OFFICE →	LWR 4	LWR 4	LWR 4	OELD	
SURNAME →	MSERVICE	Rowell	Varga	Mitchell	
DATE →	9/8/76	9/8/76	9/8/76	9/8/76	

Enclosures:

1. Facility Operating License No. DPR-71, with attachments
2. Federal Register Notice
3. Negative Declaration
4. Environmental Impact Appraisals
5. Amendment No. 5 to Indemnity Agreement No. B-71

ccs w/encl:

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

George F. Trowbridge, Esq.
 Shaw, Pittman, Potts & Trowbridge
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 Washington, D. C. 20036

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 Wilmington, North Carolina 28401

Mr. Sheldon Myers
 Attn: Mr. Jack Anderson
 Office of Federal Activities
 Environmental Protection Agency
 Room W-541, Waterside Mall
 401 M Street, S. W.
 Washington, D. C. 20460

Colonel Howard Sargent
 Executive Director of Civil Works
 Office of the Chief of Engineers
 Corps of Engineers
 Department of the Army
 Forrestal Building, Room 4-G060
 Washington, D. C. 20314

Mr. Bruce Blanchard
 Environmental Projects Review
 Department of the Interior
 Room 5321
 18th and C Streets, N. W.
 Washington, D. C. 20240

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

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

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

State Clearinghouse
 Office of the Governor
 Division of Administration
 1205 Pendleton Street
 Columbia, South Carolina 29201

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The issue of chemical reprocessing and the quantities of high level waste generated and an assessment of their environmental impact for each of the alternatives discussed above follows for the Brunswick Steam Electric Plant Unit No. 1:

- a. Fuel loading, precritical testing, and criticality testing - the operations of fuel loading, precritical testing, and criticality testing are performed with the reactor operation at source level power (10^{16} of full power) or at criticality power levels (self-sustaining nuclear reaction at 10^{14} of full power). If the fuel were exposed to these levels of operation for 2 months and 1 week, respectively, the cumulative generation of high level waste would be equivalent to that generated in less than 0.001 full power day of operation. This is equivalent to the high level waste which is contained in 0.0003 cubic foot of solidified high level waste, which is part of the reprocessing effluent.
- b. Testing at power levels not to exceed 1 percent of full power - for the performance of physics testing at very low power levels (commonly called "zero" power testing), the operation would be limited to 1 percent of full power and a cumulative fuel exposure of 300 MW days. Such operation would produce a cumulative generation of high level waste equivalent to about 0.1 full power day of operation which is the amount contained in 0.03 cubic foot of solidified high level waste.

Although the commitment of high level waste by the proposed operation is negligible in comparison with those wastes already generated and accruing, this commitment in itself is not irretrievable. The proposed operation would result in low heat generation rates and radiation levels several months subsequent to the operation, such that the fuel could be transported to another facility with minimal cooling and shielding provisions. The fuel could then be utilized in currently licensed operating reactors. Therefore, no environmental impacts associated with chemical reprocessing are attributable to the action proposed here. Since the fuel to be used is authorized for use in currently licensed operating reactors, it can be removed following testing and transported to such a facility. The environmental impacts associated with such transportation are substantially less than those evaluated and found acceptable in the Final Environmental Statement dated January 1974.

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Docket File

NRC PDR

Local PDR

Branch File

Attorney, ELD

R. C. DeYoung

Branch Chief

Project Manager

Licensing Assistant

F. J. Williams

H. Smith

B. Scott, PM (w/o tech specs)

IE (5)

N. Dube, MIPC (w/o tech specs)

M. Jinks, OA (w/4 encls per docket)

W. Miller, ADM (w/o tech specs)

ACRS (16) (make from original)

H. Denton, DSE

V. A. Moore, DSE

R. H. Vollmer, DSE

M. L. Ernst, DSE

W. P. Gammill, DSE

R. Heineman, SS (w/o tech specs)

J. Knight, SS

D. F. Ross, SS

R. L. Tedesco, SS

**A. Toalston, AIG (w/o tech specs) - Amendments affecting power
license (w/o tech specs)**

B. Scharf, OA (15 copies)

D. Skovholt

E. Hughes

EP Project Manager

EP Licensing Assistant

H. Bristow, NMSS (w/o tech specs) - OL only

V. Stello, OR

K. Goller, OR

J. McGough, OR*

D. Eisenhut, OR

W. Pasciak, OR (Appendix B only)

**bcc: J. R. Buchanan, NSIC
Thomas B. Abernathy, TIC
A. Rosenthal, ASLAB
N. H. Goodrich, ASLBP**



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

CAROLINA POWER & LIGHT COMPANY

DOCKET NO.: 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

FACILITY OPERATING LICENSE

License No. DPR-71

1. The Nuclear Regulatory Commission (the Commission) having found that:
 - A. The application for license filed by Carolina Power & Light Company (the licensee) 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 and all required notifications to other agencies or bodies have been duly made;
 - B. Construction of the Brunswick Steam Electric Plant, Unit 1 (facility), has been substantially completed in conformity with Construction Permit No. CPPR-68 and the application, as amended, the provisions of the Act and the rules and regulations of the Commission;
 - C. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
 - D. There is reasonable assurance: (i) that the activities authorized by this operating license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the rules and regulations of the Commission;
 - E. The licensee is technically and financially qualified to engage in the activities authorized by this operating license in accordance with the rules and regulations of the Commission;
 - F. The licensee has satisfied the applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements," of the Commission's regulations;
 - G. The issuance of this operating license will not be inimical to the common defense and security or to the health and safety of the public;

- H. After weighing the environmental, economic, technical, and other benefits of the facility against environmental and other costs and considering available alternatives, the issuance of Facility Operating License No. DPR-71, subject to the conditions for protection of the environment set forth herein is in accordance with Appendix D to 10 CFR Part 50, of the Commission's regulations and all applicable requirements have been satisfied; and
 - I. The receipt, possession, and use of source, byproduct, and special nuclear material as authorized by this license will be in accordance with the Commission's regulations in 10 CFR Part 30, 40, and 70, including 10 CFR Section 30.33, 40.32, 70.23 and 70.31.
2. Facility Operating License No. DPR-71 is hereby issued to the Carolina Power & Light Company to read as follows:
- A. This license applies to the Brunswick Steam Electric Plant, Unit 1, a boiling water reactor and associated equipment (the facility), owned by the Carolina Power & Light Company. The facility is located on the Cape Fear River, near Southport in Brunswick County, North Carolina, and is described in the "Final Safety Analysis Report" as supplemented and amended (Amendments 1 through 31) and the "Environmental Report" as supplemented and amended).
 - B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses Carolina Power & Light Company:
 - (1) Pursuant to Section 104b of the Act and 10 CFR Part 50, "Licensing of Production and Utilization Facilities," to possess, use, and operate the facility at the designated location in Brunswick County, North Carolina, in accordance with the procedures and limitations set forth in this license;
 - (2) Pursuant to the Act and 10 CFR Part 70, to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;
 - (3) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

- (4) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;
- (5) Pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40; Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility for testing at reactor core power levels not in excess of 24.36 megawatts thermal (one percent of rated core power) limited to a cumulative fuel exposure of 300 megawatt days.

(2) Technical Specifications

The Technical Specifications contained in Appendices A, A-Prime, and B, attached hereto, are hereby incorporated in this license. Appendix A shall be effective from the date of issuance of the Unit 1 operating license until the Appendix A-Prime becomes effective on or before the initial criticality of Brunswick Unit 2 following its initial refueling outage. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications as indicated above. The licensee shall inform the Office of Inspection and Enforcement, Region II, of the date that the Appendix A-Prime becomes effective.

- (3) The licensee will undertake a program for seismic monitoring for a minimum of two years unless termination is earlier approved by the NRC staff. The program and its control will be conducted in general conformity with the document "Brunswick Steam Electric Plant Program for Seismic Monitoring" dated

June 10, 1975, as revised June 27, 1975. The program will include: (a) not less than ten seismic monitoring stations (seven permanent and three portable), in an array approved by the NRC staff, unless a lesser number is approved by the NRC staff in writing, and (b) quarterly reports on the monitoring data to be submitted to the NRC. Should the NRC staff determine that initiation of Phase II as described within the program within the two year monitoring period, or Phase III following initiation of Phase II, is required, the licensee will either comply with a request to proceed to Phase II (or Phase III) or immediately request and be granted a hearing on the issue of whether the data on which the staff's request is based justifies the initiation of Phase II (or Phase III) under the program for seismic monitoring agreed to by the licensee and the NRC staff. Nothing herein will be construed as precluding changes in the program by the licensee which do not adversely affect the quantity of information derived from the monitoring program. NRC will be informed of any such changes in the quarterly report.

- D. The licensee shall maintain in effect and fully implement all provisions of the NRC staff-approved physical security plan, including amendments and changes made pursuant to the authority of Section 50.54(p) of 10 CFR Part 50. The approved security plan consists of proprietary documents (pursuant to Section 2.790 of 10 CFR Part 2), collectively titled, "Carolina Power & Light Company - Brunswick Steam Electric Plant - Industrial Security Plan," as follows:

Original dated February 27, 1973, July 3, 1973, October 5, 1973, and November 30, 1973;

Amendment 1 dated October 11, 1974;

Amendment 2 dated December 20, 1974;

Amendment 3 dated August 8, 1975 and November 6, 1975;

Amendment 4 dated March 4, 1976, and July 19, 1976.

- E. This license is subject to the following additional conditions for the protection of the environment:

- a. If during operation of the facility, the monitoring program indicates that a serious adverse environmental impact is occurring, the licensee will promptly take steps to reduce such impact to an acceptable level and seek ways of alleviating any impact which is unavoidable.
- b. The licensee shall comply with all the terms, provisions, and conditions of the "Stipulation by Applicant, Intervenor and AEC Regulatory Staff" dated July 8, 1974 (hereafter "the Stipulation"), required to be performed by the licensee, including, but not limited to any conditions expressly noted in a. above. Provided, however, that the installation date for cooling towers as set forth in Paragraph 3 of the Stipulation of May 1, 1978 is hereby extended to January 1, 1979, or the installation date as finally determined by the Environmental Protection Agency in its Adjudicatory Hearing proceeding on the facility's Section 402 Federal Water Pollution Control Act permit, whichever is earlier.
- c. The licensee shall comply with the requirements of the Environmental Technical Specifications which accompany the operating license and, to the extent that such requirements are modified by conditions contained in a permit issued pursuant to Section 402 of the Federal Water Pollution Control Act, as amended, the licensee shall comply with the effluent limitations contained in such permit.

FOR THE NUCLEAR REGULATORY COMMISSION



Roger S. Boyd, Director
Division of Project Management
Office of Nuclear Reactor Regulation

Attachments:

1. Appendices A, A-Prime, and B -
Technical Specifications

Date of Issuance:
September 8, 1976

CAROLINA POWER & LIGHT COMPANY


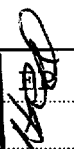
DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

FACILITY OPERATING LICENSE

License No. DPR-71

1. The Nuclear Regulatory Commission (the Commission) having found that:
 - A. The application for license filed by Carolina Power & Light Company (the licensee) 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 and all required notifications to other agencies or bodies have been duly made;
 - B. Construction of the Brunswick Steam Electric Plant, Unit 1 (facility), has been substantially completed in conformity with Construction Permit No. CPPR-68 and the application, as amended, the provisions of the Act and the rules and regulations of the Commission;
 - C. The facility will operate in conformity with the application, as amended, the provisions of the Act, and the rules and regulations of the Commission;
 - D. There is reasonable assurance: (i) that the activities authorized by this operating license can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the rules and regulations of the Commission;
 - E. The licensee is technically and financially qualified to engage in the activities authorized by this operating license in accordance with the rules and regulations of the Commission;
 - F. The licensee has satisfied the applicable provisions of 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements," of the Commission's regulations;
 - G. The issuance of this operating license will not be inimical to the common defense and security or to the health and safety of the public;

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- H. After weighing the environmental, economic, technical, and other benefits of the facility against environmental and other costs and considering available alternatives, the issuance of Facility Operating License No. DPR-71, subject to the conditions for protection of the environment set forth herein is in accordance with Appendix D to 10 CFR Part 50, of the Commission's regulations and all applicable requirements have been satisfied; and
- I. The receipt, possession, and use of source, byproduct, and special nuclear material as authorized by this license will be in accordance with the Commission's regulations in 10 CFR Part 30, 40, and 70, including 10 CFR Section 30.33, 40.32, 70.23 and 70.31.

2. Facility Operating License No. DPR-71 is hereby issued to the Carolina Power & Light Company to read as follows:

- A. This license applies to the Brunswick Steam Electric Plant, Unit 1, a boiling water reactor and associated equipment (the facility), owned by the Carolina Power & Light Company. The facility is located on the Cape Fear River, near Southport in Brunswick County, North Carolina, and is described in the "Final Safety Analysis Report" as supplemented and amended (Amendments 1 through 31) and the "Environmental Report" as supplemented and amended).
- B. Subject to the conditions and requirements incorporated herein, the Commission hereby licenses Carolina Power & Light Company:
 - (1) Pursuant to Section 104b of the Act and 10 CFR Part 50, "Licensing of Production and Utilization Facilities," to possess, use, and operate the facility at the designated location in Brunswick County, North Carolina, in accordance with the procedures and limitations set forth in this license;
 - (2) Pursuant to the Act and 10 CFR Part 70, to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;
 - (3) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

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- (4) Pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components;
- (5) Pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I: Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40; Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

The licensee is authorized to operate the facility for testing at reactor core power levels not in excess of 24.36 megawatts thermal (one percent of rated core power) limited to a cumulative fuel exposure of 300 megawatt days.

(2) Technical Specifications

The Technical Specifications contained in Appendices A, A-Prime, and B, attached hereto, are hereby incorporated in this license. Appendix A shall be effective from the date of issuance of the Unit 1 operating license until the Appendix A-Prime becomes effective on or before the initial criticality of Brunswick Unit 2 following its initial refueling outage. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications as indicated above. The licensee shall inform the Office of Inspection and Enforcement, Region II, of the date that the Appendix A-Prime becomes effective.

- (3) The licensee will undertake a program for seismic monitoring for a minimum of two years unless termination is earlier approved by the NRC staff. The program and its control will be conducted in general conformity with the document "Brunswick Steam Electric Plant Program for Seismic Monitoring" dated

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June 10, 1975, as revised June 27, 1975. The program will include: (a) not less than ten seismic monitoring stations (seven permanent and three portable), in an array approved by the NRC staff, unless a lesser number is approved by the NRC staff in writing, and (b) quarterly reports on the monitoring data to be submitted to the NRC. Should the NRC staff determine that initiation of Phase II as described within the program within the two year monitoring period, or Phase III following initiation of Phase II, is required, the licensee will either comply with a request to proceed to Phase II (or Phase III) or immediately request and be granted a hearing on the issue of whether the data on which the staff's request is based justifies the initiation of Phase II (or Phase III) under the program for seismic monitoring agreed to by the licensee and the NRC staff. Nothing herein will be construed as precluding changes in the program by the licensee which do not adversely affect the quantity of information derived from the monitoring program. NRC will be informed of any such changes in the quarterly report.

- D. The licensee shall maintain in effect and fully implement all provisions of the NRC staff-approved physical security plan, including amendments and changes made pursuant to the authority of Section 50.54(p) of 10 CFR Part 50. The approved security plan consists of proprietary documents (pursuant to Section 2.790 of 10 CFR Part 2), collectively titled, "Carolina Power & Light Company - Brunswick Steam Electric Plant - Industrial Security Plan," as follows:

Original dated February 27, 1973, July 3, 1973, October 5, 1973, and November 30, 1973;

Amendment 1 dated October 11, 1974;

Amendment 2 dated December 20, 1974;

Amendment 3 dated August 8, 1975 and November 6, 1975;

Amendment 4 dated March 4, 1976, and July 19, 1976.

- E. This license is subject to the following additional conditions for the protection of the environment:

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- a. If during operation of the facility, the monitoring program indicates that a serious adverse environmental impact is occurring, the licensee will promptly take steps to reduce such impact to an acceptable level and seek ways of alleviating any impact which is unavoidable.
- b. The licensee shall comply with all the terms, provisions, and conditions of the "Stipulation by Applicant, Intervenor and AEC Regulatory Staff" dated July 8, 1974 (hereafter "the Stipulation"), required to be performed by the licensee, including, but not limited to any conditions expressly noted in a. above. Provided, however, that the installation date for cooling towers as set forth in Paragraph 3 of the Stipulation of May 1, 1978 is hereby extended to January 1, 1979, or the installation date as finally determined by the Environmental Protection Agency in its Adjudicatory Hearing proceeding on the facility's Section 402 Federal Water Pollution Control Act permit, whichever is earlier.
- c. The licensee shall comply with the requirements of the Environmental Technical Specifications which accompany the operating license and, to the extent that such requirements are modified by conditions contained in a permit issued pursuant to Section 402 of the Federal Water Pollution Control Act, as amended, the licensee shall comply with the effluent limitations contained in such permit.

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by R. C. DeYoung

Roger S. Boyd, Director
Division of Project Management
Office of Nuclear Reactor Regulation

Attachments:

- 1. Appendices A, A-Prime, and B -
Technical Specifications

Date of Issuance:
September 8, 1976

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UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-325

CAROLINA POWER & LIGHT COMPANY

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

NOTICE OF ISSUANCE OF A FACILITY OPERATING LICENSE

Notice is hereby given that the Nuclear Regulatory Commission (the Commission) has issued Facility Operating License No. DPR-71 to Carolina Power & Light Company. License No. DPR-71 authorizes operation of the Brunswick Steam Electric Plant, Unit 1, in accordance with the provisions of the license and the Technical Specifications. The Brunswick Steam Electric Plant, Unit 1, is a boiling water nuclear reactor located at the licensee's site near Southport in Brunswick County, North Carolina.

The Commission has made appropriate findings regarding the environmental impact associated with issuing an operating license for testing purposes. These findings are contained in documents entitled, "Negative Declaration Regarding Issuance of a Limited Facility License DPR-71, Brunswick Steam Electric Plant, Unit 1," and "Environmental Impact Appraisal of Issuance of Fuel Loading, Criticality and Low-Power Testing Operating License for Brunswick Steam Electric Plant, Unit 1", and "Environmental Appraisal of a Possible Delay in Construction of Cooling Towers at Brunswick Steam Electric Plant, Units 1 and 2." Pursuant to the findings in these documents, Facility Operating License DPR-71 authorizes operation of the Brunswick Steam Electric Plant, Unit 1, at a

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reactor core power level not to exceed 24.36 megawatts thermal for testing purposes, limited to a cumulative fuel exposure of 300 megawatt days.

The Commission has made appropriate findings as required by the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license. The application for the license complies with the standards and requirements of the Act and the Commission's rules and regulations.

A copy of (1) Facility Operating License No. DPR-71, complete with Technical Specifications (Appendices "A", "A-Prime", and "B"); (2) the "Negative Declaration Regarding Issuance of a Limited Facility License DPR-71, Brunswick Steam Electric Plant, Unit 1"; (3) the "Environmental Impact Appraisal of Issuance of Fuel Loading, Criticality Low-Power Testing Operating License for Brunswick Steam Electric Plant, Unit 1", and the "Environmental Appraisal of a Possible Delay in Construction of Cooling Towers at Brunswick Steam Electric Plant, Units 1 and 2"; (4) the report of the Advisory Committee on Reactor Safeguards, dated December 11, 1973; (5) the Office of Nuclear Reactor Regulation's Safety Evaluation Report dated November 1973, and Supplements thereto dated January 31, 1974, December 23, 1974, December 27, 1974, and September 1976, respectively; (6) the Final Safety Analysis Report and amendments thereto; (7) the applicant's Environmental Report

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dated June 15, 1973, and supplements thereto; (3) the Final Environmental Statement dated January 1974, are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C., and the Southport-Brunswick County Library, 109 W. Moore Street, Southport, North Carolina 28461. Single copies of items (1), (2), (3), (4), (5) and (8) may be obtained upon request addressed to the United States Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Project Management.

Dated at Bethesda, Maryland, this 8th day of September 1976.

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by
Steven A. Varga

S. A. Varga, Chief
Light Water Reactors Branch 4
Division of Project Management

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NEGATIVE DECLARATION
REGARDING ISSUANCE OF
A LIMITED FACILITY LICENSE DPR-71
BRUNSWICK STEAM ELECTRIC PLANT UNIT NO. 1
DOCKET NO. 50-325

The U.S. Nuclear Regulatory Commission (the Commission) is issuing a limited Facility Operating License No. DPR-71 to Carolina Power and Light Company, for authorizing certain operations of the Brunswick Steam Electric Plant Unit No. 1, located in Brunswick County, North Carolina.

The license would authorize operation of the facility at not more than 1 percent of full power for the purpose of testing the facility.

The Commission has prepared an environmental impact appraisal for the limited license and has concluded that an environmental impact statement for this particular action is not warranted because there will be no environmental impact significantly affecting the quality of the human environment.

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The environmental impact appraisal is 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. A copy may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Project Management.

Dated at Bethesda, Maryland, this

FOR THE NUCLEAR REGULATORY COMMISSION

George W. Knighton, Chief
 Environmental Projects Branch No. 1
 Division of Site Safety
 and Environmental Analysis

OFFICE ➤	DSE:EP-1	<i>Paul</i>				
SURNAME ➤	RPGeckler	<i>9/3/76</i>				
DATE ➤	9/3/76					

Environmental Impact Appraisal
Of Issuance Of Fuel Loading, Criticality And
Low-Power Testing Operating License for Brunswick Steam Electric
Plant Unit No. 1

1. Description of Proposed Action

The action proposed is the issuance of an operating license for the Brunswick Steam Electric Plant Unit No. 1 whereunder the licensee would be authorized to operate the facility at not more than 1 percent of full power for the purpose of testing the facility. Within the scope of this authorization, various alternative restrictions could be imposed, which would limit the generation of high level waste to pre-determined amounts, which are appraised to be of no significant environmental impact. These alternatives are:

- a. The loading of nuclear fuel into the reactor ~~pressure~~ vessel and the maintenance of the configuration in a non-critical, non-power-producing array. This operation, along with the reassembly of the reactor vessel components and the performance of precritical, preoperational tests, is expected to take 35 days.
- b. The completion of (a) above and operation of the reactor to achieve criticality to verify the reactivity status of the core components at very low power levels (in the order of 10^{-4} of full power). This operation is expected to take 18 days.
- c. The completion of (a) and (b) above plus the operation of the reactor at power levels not to exceed 1 percent of full power for the purpose of performing physics testing. Operation would be limited such that the total power generation would not produce significant high level waste nor foreclose alternative use of the fuel by generation of significant fission product or activation product radioactivity. Tests to be performed would take about 12 days.

Of these alternatives, alternative C, with a limitation of 300 MW days integrated power generation, is proposed to provide utilization of the already constructed facility for the purpose of checkout and testing operations without the generation of significant high level waste. Although the duration of fuel loading and testing is

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expected to be about two months, the discovery of problems, which is the purpose of such testing, may result in a prolonged testing period. In any event, the limitation of 300 MW days integrated power generation would be in effect. The proposed action would allow the completion of operations, which are necessary prior to full power operation, and would thus allow full power operation to commence earlier than would otherwise be the case if such authorization was not granted. Further, this proposed action would not commit the reactor fuel to be processed in the event further operations were not authorized for, as will be discussed in Section 2, fuel radiation levels and heat generation rates subsequent to the proposed operation would allow transport and use in other facilities where power operation is authorized. Therefore, no additional commitment of high level waste would be incurred.

2. Environmental Impacts of the Proposed Actions

The potential environmental impacts associated with this proposed action are a small fraction of those which have been fully described and found acceptable in the Final Environmental Statement dated January 1974. The impacts associated with waste management and chemical reprocessing are specifically described below. The other environmental impacts associated with this proposed action are also extremely limited. During the authorized activity the condenser cooling water system may be operated fully. This may result in the chemical and mechanical effects discussed at Section 5 and 12 of the FES. For the short period of testing operation authorized by this license and low concentration of chemical effluents from these facilities will have an insignificant effect on the ecology of the river. The stresses imposed by passage through the plant intake screens and through the cooling system, at a time when the cooling system will have little or no added heat, will have no significant effect on the aquatic ecology. During this limited testing small amounts of steam may be routed from the steam generator through the condenser cooling system. The principal source of heat during this operation will be that associated with operation of the reactor pumps. However, this amounts to less than two percent of the total heat rejected during full power operation. This quantity of heat would result in less than one degree F increase in temperature of the full cooling system flow or a proportional amount of a lesser flow. The radiological inventory accumulated during the authorized testing is extremely limited and no fuel clad damage is anticipated that could result in any significant release of radioactivity to the environment. No other environmental impacts are associated with the limited testing authorized by this license. On this basis we conclude that all such impacts are insignificant.

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- c. Impact of proposed operations - the proposed operations would generate high level waste equivalent to about 0.1 full power day of operation. Plants already licensed for operation are capable of generating about 500 times this amount of waste each day. Thus, the quantity of high level waste generated as a result of the proposed action represents a small fraction of the waste being generated in the 58 nuclear power plants currently licensed to operate.

A staff analysis has been made of the cost of delay in the issuance of operating licenses for 10 nuclear plants scheduled to go into operation in the period of 1976 through 1978. The increased cost of fuel when electrical energy is supplied from fossil plants instead of the nuclear plant, normalized to a 1000 MWe plant, is on the average about \$4 million for each month of delay. The staff has not considered the increased cost of interest associated with construction capitalization since this cost during the short term is not a part of the rate base but is carried solely by company shareholders. However, the staff estimates that this cost averages about \$2.5 million per month of delay. The fuel cost figure may be low in that it does not take account for increases in the costs of operation and maintenance when older fossil plants are called into service and increases in costs due to inflation during the period of the delay.

The potential cost savings attributable to the minimum time saving of 2 months allowed by proposed action is conservatively estimated by the staff to be \$8 million and by the applicant to be about \$20 million.

3. Conclusions and Basis for Negative Declaration

On the basis of the foregoing analysis, it is concluded that:

- a. the potential environmental impacts associated with the proposed action do not significantly affect the quality of the human environment;
- b. the potential environmental impacts associated with the quantities of high level waste, which will be generated as a result of the proposed action, do not represent an irreversible and irretrievable commitment of resources in that fuel from Brunswick Steam Electric Plant Unit No. 1 could and can be utilized in currently licensed nuclear power plants;

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- c. the small increment of waste generated as a result of the proposed action will not foreclose alternatives for adequately addressing and analyzing the environmental impacts associated with reprocessing and waste management, attributable to the licensing of Brunswick Steam Electric Plant Unit No. 1; and

Having made these conclusions, the Commission has further concluded that no environmental impact statement for the proposed action need be prepared and that a negative declaration to this effect is appropriate.

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September 8, 1976

REVISION: ENVIRONMENTAL APPRAISAL OF A POSSIBLE DELAY IN CONSTRUCTION
OF COOLING TOWERS AT BRUNSWICK STEAM ELECTRIC PLANT,
UNITS 1 AND 2

The attached "Environmental Appraisal of a Possible Delay in Construction of Cooling Towers at Brunswick Steam Electric Plant, Units 1 and 2" was prepared in connection with Amendment No. 15 to Facility Operating License (FOL) No. DPR-62 (Brunswick Steam Electric Plant, Unit 2) issued May 18, 1976. Amendment No. 15 extends by up to eight months the May 1, 1978 date for installation of cooling towers incorporated in FOL No. DPR-62 (Paragraph 2 D C) by reference to the "Stipulation by Applicant, Intervenor and AEC Regulatory Staff" dated July 8, 1974.

The EPA hearings, mentioned in the "Environmental Appraisal" cited above were completed in June 1976 and proposed findings by the parties were submitted to the Administrative Law Judge in August 1976.

One of the main assumptions used in the "Environmental Appraisal" was that Unit No. 1 would begin operation in August 1976. This did not occur and, thus, there has been less flow of cooling water than was used in the evaluation. Further, since operation of Unit No. 1 will be not in excess of one percent power limited to a cumulative fuel exposure of 300 megawatt days, still less flow of cooling water will be used than on which the evaluation was made. Thus, the effects of impingement and entrainment are less than anticipated in the earlier evaluation and are therefore also acceptable.

ENVIRONMENTAL APPRAISAL OF A POSSIBLE DELAY IN CONSTRUCTION OF COOLING
TOWERS AT BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 & 2

INTRODUCTION

A. Final Environmental Assessment

In the Final Environmental Statement relating to the continued construction and proposed issuance of an operating license, dated January 1974, the staff concluded that "the plant, as presently designed, and because of the unique features of the site and cooling system, has the potential for causing serious and perhaps irreversible adverse effects on the environment of the Cape Fear Estuary, and cannot be operated for an extended period without incurring unacceptable environmental impact." (p. iv)

"The staff also concludes, based on the data available at this time, that it is unlikely that irreversible damage will occur during the first three years of plant operation..."

B. Stipulation

Prior to hearing, an agreement entitled "Stipulation by Applicant, Intervenor and AEC Regulatory Staff" was entered into on July 8, 1974. Paragraph 3 of the Stipulation reads "Applicant will proceed with engineering and procurement activities and with the construction of cooling towers on a schedule consistent with the completion of installation of cooling towers (exclusive of their connection to the cooling system) not later than May 1, 1978 ("installation date")."

The Stipulation was considered by the Atomic Safety and Licensing Board which issued its Initial Decision affirming continuation of construction permits December 26, 1974 (8 AEC 1144). The Intervenor withdrew from the proceedings as provided for in the Stipulation and the Stipulation was incorporated in License DPR-62 by reference (Paragraph 2.D.c.).

C. Applicant Request for Delay of Cooling Towers Installation Date

Operating License DPR-62 (for Unit 2) was issued December 27, 1974, and on December 31, 1974, the Environmental Protection Agency (EPA) issued a NPDES permit pursuant to Section 402 of the Federal Water Pollution Control Act which also required installation of cooling towers at the Brunswick Steam Electric Plant by May 1, 1978. EPA, pursuant to C P & L (the Applicant) request, granted an adjudicatory hearing on the NPDES permit. The hearing, which was originally scheduled to commence April 5, 1976, has been rescheduled at EPA's request for June 1, 1976. C P & L had submitted a request to the

Commission by letter of August 13, 1975 asking that the installation date for cooling towers be deferred for 31 months, until December 31, 1980. The Intervenor, by letter of August 8, 1975, advised the Commission that he does not oppose the C P & L's request. A modification of the August 13, 1975 request was submitted by letter of March 30, 1976 in which C P & L petitioned for a stay of the May 1, 1978 installation date. This request was based on an Order entered by the EPA Administrative Law Judge which, in effect, confirmed that the compliance schedule and May 1978 installation date included in the NPDES permit was a contested issue within the scope of the adjudicatory hearing and, therefore, stayed under applicable EPA regulations (40 CFR § 125.35(d)(2)).

The basis for C P & L's request is that construction of the cooling towers has proceeded to the point where it is now time for the major portion of funds to be committed. C P & L asserts that these substantial expenditures should be deferred, pending final EPA action on the time and necessity for installation of cooling towers.

C P & L also asserts that even if EPA still requires closed cycle cooling, a delay in the installation of cooling towers will not cause irreparable environmental damage.

This report is concerned with assessing the consequences of the delay in installation of cooling towers from an environmental point of view.

DISCUSSION

Three-year limit on once-through cooling and the May 1, 1978 Stipulation date

Since the staff has concluded that it is unlikely that irreversible damage will occur during the first three years of operation, changing the date for completion of cooling towers from the May 1, 1978 Stipulation date to a date corresponding to approximately three years of plant operation would be acceptable on environmental grounds.

The FES evaluated the operation of Unit No. 2 for three years and Unit No. 1 for two years at a design flow of 2,900 cfs (for both units). An acceptable tower completion date can be computed on the basis of the actual operation and flows through both units.

Unit 2 began operation on December 27, 1974. To date, it has operated at an average of two-thirds design cooling water flow. So the equivalent full-flow operation of Unit 2 has been $\frac{2}{3} \times 16 = 10.7$ months.

Unit 1 is to begin operation in August 1976. By August 1, 1976, Unit 2 will have operated the equivalent of approximately 13 months. However, future flows for both units are estimated to be approximately $\frac{3}{4}$ of the original design flow. Operation of both units at the projected flow rate to January 1, 1979, would produce the equivalent of 58 months design flow, neglecting refueling.

Thus, the operation of both units with once-through cooling until January 1, 1979 (29 months from August 1, 1976) based on actual and planned operation and flows of both units, would cover a period equivalent to that evaluated in the FES, and so would be acceptable to the staff.

OPERATIONAL DATA

Impingement

The adequacy of the licensee's data for evaluating long-term impacts is expected to be a major issue in the EPA hearing. As a first approximation, the impingement and entrainment losses during full 2-unit operation have been calculated using linear extrapolation (based on flow rates) of the available data for partial one-unit operation. The staff emphasizes that these loss estimates may be low for reasons identified in the following discussion.

In one year (January 19, 1974 - January 18, 1975) of impingement study an estimated 2,465,000 organisms weighing 42,300 pounds were collected from the screens. During the year, the volume of intake water was approximately two-thirds the design volume for one-unit operation. During February-October 1975, an estimated 2,418,000 organisms weighing 49,400 lbs. was collected. The applicant claims that 63% of these (1975) organisms could have been returned alive to the estuary; there have been no data presented to verify survival of nekton returned to the estuary. Over the 21 months in which data were collected, 4460 pounds were impinged each month (231,000 organisms) on the average. The applicant's data for (1974-75) showed a range from 30,406 (399 pounds) in November 1974 to 486,492 organisms (7123 pounds) in August 1974. The 1975 (9 months) data showed a range of from 144,494 (June) to 420,354 (August) weighing 3477 and 7159 pounds, respectively.*

The average of 4460 pounds impinged per month has a relatively large variance; the applicant calculated the 95% confidence limit for the 1974-5 monthly data to be 2297-4775 pounds and for the 1975 data, 3605-7381. Ranges of annual impingement were 27,348-57,300 pounds for 1974-5 and 43,260-88,572 pounds for 1975. For estimating impingement losses the use of the monthly average appears adequate in view of the ranges just listed. On this basis, for every month the installation date for the cooling tower is delayed, there will be an impingement loss of ~ 4,500 pounds of fish, on the average. This estimate is based on a water volume flow of approximately two-thirds of design. If flow and impingement are

*Although fewer organisms were impinged in September and October 1975 than in August, they weighed more as shown below:

<u>Month</u>	<u>Organisms</u>	<u>Weight (lbs)</u>
September 1974	331,433	8564
October	369,292	9202

linearly related, full flow would result in $3/2 \times 4,500 = 6,650$ pounds impinged per month for Unit 2. Similarly, if a linear relationship existed, Units 1 and 2 combined would double the impingement to an average of 13,300 pounds per month. This amounts to approximately 700,000 organisms per month or 8.4×10^6 organisms per year (160,000 pounds). However, it is expected that impingement rates (both in terms of numbers and weight) will increase by a factor greater than a linear rate and, hence, this estimated annual number is low by an undetermined amount.

Increased pump operation will increase the flow velocity of water in the intake canal. This area has been identified by C P & L's consultant as preferentially attractive to certain migratory fishes. The increased velocity can possibly exceed the threshold velocity below which these fishes maintain their position in the canal. This will result in increased impingement mortality of an undetermined magnitude.

Entrainment

Full two-unit operation with eight pumps will significantly increase the volume and velocity at the intake structure and could likely increase the percentage of water flow from Walden Creek-Snow's Marsh area. Assuming a linear relationship of volume flow to entrainment in the estuary, full operation with both units operating could result in losses of up to 30×10^6 larvae per day through the plant during periods of peak larvae production (in addition to losses in excess of 10^8 copepods of genus Acartia per day). Actually, increased flow may preferentially remove a greater volume of the highly productive marsh waters adjoining the intake canal, with resulting non-linear increases in entrainment losses. The Applicant has recently provided predicted entrainment for important species for one- and two-unit once-through cooling (Table 1).

CONCLUSIONS

The foregoing data do not alter the staff conclusions quoted in the first two paragraphs of the introduction of this appraisal. Based on the foregoing discussion, the staff finds that an eight-month delay in installation of cooling towers (to January 1, 1979) is acceptable in view of the equivalence of that date with three years of operation. However, the applicant has not at this time demonstrated that the requested 31-month delay is appropriate.

TABLE 1

COPELAND ATTACHMENT 189: Predicted entrainment (No./day) for projected one and two unit once-through cooling at BSEP.

Species	1 Unit		2 Units	
	Mean	Maximum	Mean	Maximum
Spot	23×10^4	69×10^5	46×10^4	137×10^5
Croaker	57×10^4	115×10^5	114×10^4	231×10^5
Trout	7×10^4	49×10^5	14×10^4	99×10^5
Flounder	0.5×10^4	1.4×10^5	1×10^4	2.8×10^5
Menhaden	2×10^4	12×10^5	4×10^4	25×10^5
Mullet	1.2×10^4	19×10^5	2.4×10^4	37×10^5
All Fish Larvae	230×10^4	334×10^5	460×10^4	668×10^5
Penaeid Shrimp	16×10^4	21×10^5	32×10^4	43×10^5
Crab Megalops	400×10^4	655×10^5	801×10^4	1311×10^5

Source: Testimony of Dr. B. J. Copeland for the C P & L Brunswick Steam Electric Plant, Vol. 2, Attachments 1976.

References:

Final Environmental Statement related to the continued construction and proposed issuance of an operating license for the Brunswick Steam Electric Plant Units 1 and 2. Carolina Power and Light Company January 1974 USAEC, Directorate of Licensing Docket Nos. 50-324 and 50-325.

Environmental Report Brunswick Steam Electric Plant 2 volumes 1971.

Technical Assistance Request No. 1818 Response - ESB's staff position regarding data supportive to C P & L's application for a license amendment to delay tower installation date at the Brunswick plant. Memo and report to Voss A. Moore from M. L. Ernst, dated January 9, 1976. Internal NRC documents.

Hogarth, W. T. Testimony for the Carolina Power and Light Company 2 volumes 1976 (No further date).

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