

January 14, 2004

Mr. C. J. Gannon  
Vice President  
Brunswick Steam Electric Plant  
Carolina Power & Light Company  
Post Office Box 10429  
Southport, North Carolina 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 - ISSUANCE OF  
AMENDMENTS REGARDING THE BOILING WATER REACTOR VESSEL AND  
INTERNALS PROJECT REACTOR PRESSURE VESSEL INTEGRATED  
SURVEILLANCE PROGRAM (TAC NOS. MC0254 AND MC0255)

Dear Mr. Gannon:

The Commission has issued the enclosed Amendment No. 229 to Facility Operating License No. DPR-71 and Amendment No. 257 to Facility Operating License No. DPR-62 for Brunswick Steam Electric Plant, Units 1 and 2. The amendments are in response to your application dated May 29, 2003.

The amendments approve changes to the Brunswick Steam Electric Plant, Units 1 and 2, Updated Final Safety Analysis Report to implement the Boiling Water Reactor Vessel and Internals Project reactor pressure vessel integrated surveillance program as the basis for demonstrating compliance with Title 10 of the *Code of Federal Regulations*, Part 50, Appendix H.

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

Sincerely,

/RA/

Margaret H. Chernoff, Project Manager, Section 2  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-325 and 50-324

Enclosures:

1. Amendment No. 229 to License No. DPR-71
2. Amendment No. 257 to License No. DPR-62
3. Safety Evaluation

cc w/enclosures: See next page

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DISTRIBUTION:

PUBLIC	PD II-2 Rdg.	OGC	T. Boyce
G. Hill (4)	S. Coffin	J. Arroyo	B. Mozafari
ACRS	P. Fredrickson, RII	L. Lois	A. Howe
M. Chernoff	E. Dunnington		

ADAMS: ML040150192

\*See previous concurrence

OFFICE	PM:PDII-2	LA:PDII-2	EMCB/SRXB	OGC*	SC:PDII-2
NAME	MChernoff	EDunnington	SE Input	LCZaccari	AHowe
DATE	1/14/04	1/14/04	12/18/03	1/7/04	1/14/04

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CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-325

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 229

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 May 29, 2003, 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, changes to the Brunswick Steam Electric Plant, Unit 1, Updated Final Safety Analysis Report (UFSAR) to reflect changes to the reactor pressure vessel integrated surveillance program, as described in the NRC Safety Evaluation dated January 14, 2004, are authorized. The licensee shall submit the update of the UFSAR authorized by this amendment in accordance with 10 CFR 50.71(e).

3. This license amendment is effective as of its date of issuance and shall be implemented as stated in 2 above.

FOR THE NUCLEAR REGULATORY COMMISSION

***/RA/***

Allen G. Howe, Chief, Section 2  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Date of Issuance: January 14, 2004

CAROLINA POWER & LIGHT COMPANY

DOCKET NO. 50-324

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 257

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 May 29, 2003, 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, changes to the Brunswick Steam Electric Plant, Unit 2, Updated Final Safety Analysis Report (UFSAR) to reflect changes to the reactor pressure vessel integrated surveillance program, as described in the NRC Safety Evaluation dated January 14, 2004, are authorized. The licensee shall submit the update of the UFSAR authorized by this amendment in accordance with 10 CFR 50.71(e).

- 2 -

3. This license amendment is effective as of its date of issuance and shall be implemented as stated in 2 above.

FOR THE NUCLEAR REGULATORY COMMISSION

***/RA/***

Allen G. Howe, Chief, Section 2  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Date of Issuance: January 14, 2004

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 229 TO FACILITY OPERATING LICENSE NO. DPR-71  
AND AMENDMENT NO. 257 TO FACILITY OPERATING LICENSE NO. DPR-62  
CAROLINA POWER & LIGHT COMPANY  
BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-325 AND 50-324

## 1.0 INTRODUCTION

By letter dated May 29, 2003, the Carolina Power & Light Company (the licensee) proposed a license amendment to revise the Updated Final Safety Analysis Report (UFSAR) to modify the basis for its compliance with the requirements of Appendix H to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Reactor Vessel Material Surveillance Program Requirements." The objective of Carolina Power & Light Company's request is to implement the Boiling Water Reactor Vessel and Internals Project (BWRVIP) reactor pressure vessel (RPV) integrated surveillance program (ISP) as the basis for demonstrating compliance of Brunswick Steam Electric Plant (BSEP), Units 1 and 2, with the requirements of Appendix H to 10 CFR Part 50.

The BWRVIP RPV ISP was submitted for U.S. Nuclear Regulatory Commission (NRC) staff review and approval in topical reports BWRVIP-78, "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan," and BWRVIP-86, "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan." Additional information necessary to establish the technical basis for, and proposed implementation of, the BWRVIP ISP was provided in letters from the BWRVIP to the NRC dated December 15, 2000, and May 30, 2001. The NRC staff approved the proposed BWRVIP ISP in a Safety Evaluation (SE) that was provided to the BWRVIP by letter dated February 1, 2002. However, the NRC staff's SE required that plant-specific information be provided by BWR licensees who wish to implement the BWRVIP ISP for their facilities. The licensee's May 29, 2003, submittal addressed the plant-specific information required in the NRC staff's February 1, 2002, BWRVIP ISP SE.

## 2.0 REGULATORY EVALUATION

Nuclear power plant licensees are required by 10 CFR Part 50, Appendix H, to implement RPV surveillance programs to "monitor changes in the fracture toughness properties of ferritic materials in the reactor vessel beltline region ... which result from exposure of these materials to neutron irradiation and the thermal environment." Two specific alternatives are provided with regard to the design of a facility's RPV surveillance program that may be used to address the requirements of 10 CFR Part 50, Appendix H.

The first alternative is the implementation of a plant-specific RPV surveillance program consistent with the requirements of American Society for Testing and Materials (ASTM) Standard Practice E 185, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels." In the design of a plant-specific RPV surveillance program, a licensee may use the edition of ASTM Standard Practice E 185 that was current on the issue date of the American Society of Mechanical Engineers (ASME) Code to which the reactor vessel was purchased, or later editions through the 1982 edition.

The second alternative provided in 10 CFR Part 50, Appendix H, is the implementation of an ISP. An ISP is defined in 10 CFR Part 50, Appendix H, as occurring when, "the representative materials chosen for surveillance for a reactor are irradiated in one or more other reactors that have similar design and operating features." Five specific criteria are stated in Section III.C.1 of 10 CFR Part 50, Appendix H, that must be met to support approval of an ISP:

- a. The reactor in which the materials will be irradiated and the reactor for which the materials are being irradiated must have sufficiently similar design and operating features to permit accurate comparisons of the predicted amount of radiation damage.
- b. Each reactor must have an adequate dosimetry program.
- c. There must be adequate arrangement for data sharing between plants.
- d. There must be a contingency plan to assure that the surveillance program for each reactor will not be jeopardized by operation at reduced power level or by an extended outage of another reactor from which data are expected.
- e. There must be substantial advantages to be gained, such as reduced power outages or reduced personnel exposure to radiation, as a direct result of not requiring surveillance capsules in all reactors in the set.

As noted in Section 1.0 of this SE, the NRC staff approved the proposed BWRVIP ISP in an SE that was issued to the BWRVIP by letter dated February 1, 2002. All of the criteria cited above for approval of the ISP were addressed either completely or partially in the SE. For those criteria that could not be fully addressed in the SE, plant-specific information would be required from licensees who wished to implement the BWRVIP for their facilities. As stated in the SE:

[L]icensees who wish to participate in the BWR ISP must provide, for NRC staff review and approval, information which defines how they will determine RPV and/or surveillance capsule fluences based on the dosimetry data which will be available for their facilities. This information must be submitted concurrently with each licensee's submittal to replace their existing plant-specific surveillance program with the BWR ISP as part of their facility's licensing basis. The information submitted must be sufficient for the staff to determine that:

- (1) RPV and surveillance capsule fluences will be established as based on the use of an NRC-approved fluence methodology that will provide acceptable results based on the available dosimetry data,



- (2) if one methodology is used to determine the neutron fluence values for a licensee's RPV and one or more different methodologies are used to establish the neutron fluence values for the ISP surveillance capsules which "represent" that RPV in the ISP, the results of these differing methodologies are compatible (i.e., within acceptable levels of uncertainty for each calculation).

Regulatory Guide 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence," describes methods and assumptions acceptable to the NRC staff for determining the pressure vessel neutron fluence. The guide is intended to ensure the accuracy and reliability of the fluence determination required by General Design Criteria 14, 30, and 31 of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50.

This plant-specific information was required by the NRC staff to ensure that Criterion III.C.1.b of 10 CFR Part 50, Appendix H, for an ISP could be met by each facility, and to confirm that data that would be shared as part of the BWRVIP ISP could be effectively utilized by each licensee for the monitoring of RPV embrittlement for their facility.

### 3.0 TECHNICAL EVALUATION

In its letter dated May 29, 2003, Carolina Power & Light Company submitted plant-specific information for BSEP, Units 1 and 2, which addressed the information requested in the NRC staff BWRVIP ISP SE. The licensee's submittal contained a revised Section 5.3.1.6 of the BSEP, Units 1 and 2, UFSAR that stated, in part:

For operation at 2923 MWt, fluence assessments were performed for the Brunswick, Units 1 and 2, pressure vessel beltline regions based on the guidance specified in Regulatory Guide 1.190 (Reference 5.3.1-3). Exposures of the materials were determined on a plant- and fuel cycle-specific basis.

The NRC staff has concluded that the inclusion of this statement in the BSEP, Units 1 and 2, UFSAR is sufficient to address both items (1) and (2) from the NRC staff BWRVIP ISP SE. Regarding item (1), the licensee's use of a methodology for determining the BSEP, Units 1 and 2, RPV neutron fluence values in accordance with RG 1.190 will provide acceptable results based upon the available dosimetry data. Regarding item (2), RPV surveillance capsules tested under the BWRVIP ISP will have their fluences determined by the use of a methodology that is consistent with the attributes of RG 1.190. The NRC staff has concluded that any two (or more) different fluence methodologies will provide "compatible" (as defined in the BWRVIP ISP SE) results provided that the best estimate fluence values are within each other's uncertainty bounds.

Also, the revised Section 5.3.1.6 of the BSEP, Units 1 and 2, UFSAR documented the licensee's incorporation of the BWRVIP ISP into the BSEP, Units 1 and 2, licensing basis. The revised UFSAR section stated, in part:

In 2003, the NRC approved BSEP Units 1 and 2 participation in the BWR Vessel and Internals Project (BWRVIP) Integrated Surveillance Program (ISP) as described in BWRVIP-78 and BWRVIP-86-A. The ISP meets the requirements of 10 CFR Part 50, Appendix H and ASTM E185-1972. The current ISP

withdrawal schedule is based on the latest NRC-approved revision of BWRVIP-86-A. Based on this schedule, no capsules are scheduled to be withdrawn from either Brunswick Units 1 or 2.

In addition, the licensee provided the withdrawal schedule for BSEP, Units 1 and 2, in Table 5.3.1-2, "Brunswick Surveillance Specimens," of the BSEP UFSAR. As a participant in the ISP, BSEP is not scheduled to remove any material specimens. According to the ISP schedule, UFSAR Table 5.3.1-2 will be updated to reflect the remaining BSEP capsules as standby material specimens. The NRC staff has concluded that the information provided in the revised BSEP, Units 1 and 2, UFSAR is adequate to document the licensee's intent to appropriately implement the BWRVIP ISP as the method for demonstrating compliance of BSEP, Units 1 and 2, with the requirements of 10 CFR Part 50, Appendix H.

The licensee is also revising the appropriate Technical Specification Bases to reflect implementation of the BWRVIP ISP. The NRC staff has no objection to these changes.

#### 4.0 SUMMARY

The NRC staff has concluded that the information provided by Carolina Power & Light Company was sufficient to conclude that the BWRVIP ISP, as approved in the BWRVIP ISP SE, can be implemented for BSEP, Units 1 and 2, as the basis for demonstrating the facility's continued compliance with the requirements of Appendix H to 10 CFR Part 50. As part of the implementation and documentation of the licensee's intent to utilize the BWRVIP ISP for this purpose, the licensee shall modify the BSEP, Units 1 and 2, UFSAR as noted above and as stated in their May 29, 2003, submittal. The UFSAR will be updated by the licensee in accordance with the requirements of 10 CFR 50.71(e).

#### 5.0 STATE CONSULTATION

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

#### 6.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration (68 FR 49814), and there has been no public comment on such finding. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

## 7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: Jose Arroyo  
Lambros Lois

Date: January 14, 2004

Mr. C. J. Gannon  
Carolina Power & Light Company

Brunswick Steam Electric Plant  
Units 1 and 2

cc:

Steven R. Carr  
Associate General Counsel - Legal  
Department  
Progress Energy Service Company, LLC  
Post Office Box 1551  
Raleigh, North Carolina 27602-1551

Mr. Robert P. Gruber  
Executive Director  
Public Staff - NCUC  
4326 Mail Service Center  
Raleigh, North Carolina 27699-4326

Mr. David R. Sandifer, Chairperson  
Brunswick County Board of Commissioners  
Post Office Box 249  
Bolivia, North Carolina 28422

Mr. William C. Noll  
Director - Site Operations  
Brunswick Steam Electric Plant  
Carolina Power & Light Company  
Post Office Box 10429  
Southport, North Carolina 28461-0429

Resident Inspector  
U. S. Nuclear Regulatory Commission  
8470 River Road  
Southport, North Carolina 28461

Mr. Norman R. Holden, Mayor  
City of Southport  
201 East Moore Street  
Southport, North Carolina 28461

Mr. John H. O'Neill, Jr.  
Shaw, Pittman, Potts & Trowbridge  
2300 N Street NW.  
Washington, DC 20037-1128

Mr. Warren Lee  
Emergency Management Director  
New Hanover County Department of  
Emergency Management  
Post Office Box 1525  
Wilmington, North Carolina 28402-1525

Ms. Beverly Hall, Section Chief  
Division of Radiation Protection  
N.C. Department of Environment  
and Natural Resources  
3825 Barrett Dr.  
Raleigh, North Carolina 27609-7721

Mr. James W. Holt, Manager  
Performance Evaluation and  
Regulatory Affairs PEB 7  
Progress Energy  
Post Office Box 1551  
Raleigh, North Carolina 27602-1551

Mr. David H. Hinds  
Plant General Manager  
Brunswick Steam Electric Plant  
Carolina Power & Light Company  
Post Office Box 10429  
Southport, North Carolina 28461-0429

Mr. Edward T. O'Neil  
Manager - Support Services  
Brunswick Steam Electric Plant  
Carolina Power & Light Company  
Post Office Box 10429  
Southport, North Carolina 28461

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

Ms. Margaret A. Force  
Assistant Attorney General  
State of North Carolina  
Post Office Box 629  
Raleigh, North Carolina 27602