



**Progress Energy**

**DEC 08 2011**

SERIAL: BSEP 11-0106

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Subject: Brunswick Steam Electric Plant, Unit No. 2  
Renewed Facility Operating License No. DPR-62  
Docket No. 50-324  
Revision of Regulatory Commitment Regarding Replacement of Unit 2  
Core Plate Plugs

Ladies and Gentlemen:

The purpose of this letter is to request NRC approval of a change to a license renewal-related commitment to replace the existing Brunswick Steam Electric Plant (BSEP), Unit 2 core plate plugs prior to entering the period of extended operation authorized by the renewed facility operating licenses. A description of the commitment and reason for the commitment change is provided in Enclosure 1. Enclosure 2 provides Structural Integrity Associates, Inc., Report No. 1000771.402, Revision 0, *Life Extension for Core Plate Plugs at Brunswick Steam Electric Plant Unit 2*. The revised regulatory commitment is provided in Enclosure 3.

Please refer any questions regarding this submittal to Ms. Annette Pope, Supervisor - Licensing/Regulatory Programs, at (910) 457-2184.

Sincerely,

Phyllis N. Mentel  
Manager - Support Services  
Brunswick Steam Electric Plant

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NRR

WRM/wrm

Enclosures:

1. License Renewal Commitment and Basis for Change
2. Structural Integrity Associates, Inc. Report No. 1000771.402, Revision 0, *Life Extension for Core Plate Plugs at Brunswick Steam Electric Plant Unit 2*
3. List of Regulatory Commitments

cc (with enclosures):

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## **License Renewal Commitment and Basis for Change**

### Summary

Carolina Power & Light Company (CP&L), now doing business as Progress Energy Carolinas, Inc., is requesting NRC approval of a change to a license renewal-related commitment to replace the existing Brunswick Steam Electric Plant (BSEP), Unit 2 core plate plugs prior to entering the period of extended operation authorized by the renewed facility operating license. The period of extended operation for Unit 2 begins December 28, 2014 (i.e., the original license expiration date for Unit 2 was midnight, December 27, 2014).

CP&L attempted to replace the Unit 2 core plate plugs during the 2011 refueling outage, but encountered problems with installing the replacement plugs. CP&L currently plans to replace the Unit 2 core plate plugs during the 2013 refueling outage. This commitment change is being requested as a contingency, in case unforeseen problems occur during the 2013 replacement work that preclude completion of the core plate plug replacement work at that time.

### Discussion

By letter dated October 18, 2004 (i.e., Reference 1), CP&L submitted an application for renewal of the operating licenses for Brunswick Steam Electric Plant (BSEP), Units 1 and 2. Section 4.2.8 of the license renewal application provided a time limited aging analysis (TLAA) analyzing stress relaxation of the Unit 2 spring-loaded core plate plugs. The Unit 2 core plate plugs are fabricated with a nickel-based alloy spring that is subject to loss of preload due to stress relaxation. The Unit 1 core plate plugs are welded in place and thus are not subject to the spring relaxation concern.

In a response to an NRC request for additional information dated June 14, 2005 (i.e., Reference 2), CP&L committed to manage the loss of preload due to stress relaxation of the spring-loaded core plate plugs by replacing the core plate plugs.

Subsequently, in a letter dated July 18, 2005 (i.e., Reference 3), CP&L stated the following:

Based on current fluence projections, the replacement of the spring-loaded core plate plugs installed in Unit 2 will occur during the refueling outage that is currently scheduled for 2011. Any evaluation to extend the service life of the spring-loaded core plate plugs will be submitted to the NRC for review and approval.

The July 18, 2005, letter also revised the License Renewal Commitment for the Reactor Vessel Internals Structural Integrity Program as follows:

Loss of preload due to stress relaxation of the Unit 2 spring-loaded core plate plugs will be managed by replacing the plugs. Any evaluation to extend service life of the spring-loaded core plate plugs will be submitted to the NRC for review and approval.

By letter dated March 31, 2006 (i.e., Reference 4), the NRC issued the final safety evaluation report associated with license renewal of BSEP Units 1 and 2. In the final safety evaluation, the NRC accepted CP&L's commitment to replace the Unit 2 spring-loaded core plate plugs prior to the period of extended operation for Unit 2 and noted any decision to extend the life of the plugs would be evaluated by CP&L and the evaluation would be submitted to the NRC for review and approval (i.e., see page 3-129 of Reference 4). The renewed facility operating licenses for BSEP Units 1 and 2 were subsequently issued by letter dated June 26, 2006 (Reference 5).

During the 2011 Unit 2 refueling outage, replacement of the Unit 2 core plate plugs was attempted, but problems with the configuration of the replacement plugs prevented them from being installed. As a result, the core plate plug replacements were postponed until the 2013 Unit 2 refueling outage.

CP&L plans to replace the Unit 2 core plate plugs during the 2013 Unit 2 refueling outage. However, as a contingency, in case unforeseen problems occur during the replacement work, CP&L proposes the following change to the core plate plug replacement commitment:

Replacement of the spring-loaded core plate plugs installed in Unit 2 will be completed during the refueling outage currently scheduled for 2013. However, if installation problems preclude completion of the core plate plug replacements during the 2013 refueling outage, replacement of the Unit 2 spring-loaded core plate plugs may be deferred for completion during the refueling outage currently scheduled for 2015.

Enclosure 2 provides Structural Integrity Associates, Inc., Report No. 1000771.402, Revision 0, "Life Extension for Core Plate Plugs at Brunswick Steam Electric Plant Unit 2." This report evaluates core plate plug design life, using plant-specific fluence and reactor pressure vessel pressure differences, and concludes the core plate plugs will remain functional for at least 30 effective full power years (EFPY) of plant operation. As of October 31, 2011, Unit 2 has operated for approximately 25.09 EFPY. Continued operation at an assumed 100 percent capacity factor will not result in reaching the 30 EFPY threshold until approximately calendar year 2016. Thus, this demonstrates that degradation of the core plate plugs is not expected to occur during the additional period that may be needed if core plate plug replacement cannot be accomplished during the 2013 Unit 2 refueling outage.

References

1. Letter from Cornelius J. Gannon (CP&L) to U.S. NRC Document Control Desk, "Application for Renewal of Operating Licenses," dated October 18, 2004.
2. Letter from Cornelius J. Gannon (CP&L) to U.S. NRC Document Control Desk, "Response to Request for Additional Information – License Renewal (NRC TAC Nos. MC4639 and MC4640)," dated June 14, 2005, ADAMS Accession Number ML051720468, RAI B.2.28-5.
3. Letter from Cornelius J. Gannon (CP&L) to U.S. NRC Document Control Desk, "Clarification of Responses to Request for Additional Information – License Renewal (NRC TAC Nos. MC4639 and MC4640)," dated July 18, 2005, ADAMS Accession Number ML052070762.
4. Letter from Frank P. Gillespie (NRC) to James Scarola (CP&L), "Final Safety Evaluation Report Related to the License Renewal of Brunswick Steam Electric Plant, Units 1 and 2 (TAC Nos. MC4639 and MC4640)," dated March 31, 2006, ADAMS Accession Number s ML060890414 and ML060890421.
5. Letter from Maurice Heath (NRC) to James Scarola (CP&L), "Issuance of Renewed Facility Operating License Nos. DPR-71 and DPR-62 for Brunswick Steam Electric Plant, Units 1 and 2 (TAC Nos. MC4639 and MC4640)," dated June 26, 2006, ADAMS Accession Numbers ML061660358, ML061660375, ML061660378 and ML061660381.