Brunswick Nuclear Plant
P.O. Box 10429
Southport, NC 28461

April 11, 2018

Serial: BSEP 18-0048 10 CFR 50.55a(z)(1)

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

Subject: Brunswick Steam Electric Plant, Unit Nos. 1 and 2
Renewed Facility Operating License Nos. DPR-71 and DPR-62
Docket Nos. 50-325 and 50-324
Response to Request for Additional Information Regarding Inservice Inspection Program Proposed Alternative ISI-09 In Accordance With 10 CFR 50.55a(z)(1) Regarding Reactor Pressure Vessel Circumferential Shell Weld Examinations

References:
1. Letter from Bryan B. Wooten (Duke Energy) to the U.S. Nuclear Regulatory Commission Document Control Desk, *Inservice Inspection Program Proposed Alternative ISI-09 In Accordance With 10 CFR 50.55a(z)(1) Regarding Reactor Pressure Vessel Circumferential Shell Weld Examinations*, dated January 23, 2018, ADAMS Accession Number ML18023A134

2. NRC E-mail Capture, *Brunswick Unit 1 and Unit 2 - Request for Additional Information related to Request for Alternative ISI-09, EPID L-2018-LLR-0001,* dated March 15, 2018

Ladies and Gentlemen:

By letter dated January 23, 2018 (i.e., Reference 1), Duke Energy Progress, LLC (Duke Energy), submitted a relief request (i.e., ISI-09) for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2. The request proposed an alternative to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, 2001 Edition through 2003 Addenda. Specifically, to Table IWB-2500-1, Category B-A, Item B1.11 for examination of reactor pressure vessel (RPV) circumferential shell welds.

On March 15, 2018, by electronic mail (i.e., Reference 2), the NRC provided a request for additional information (RAI) regarding the ISI-09 relief request. Duke Energy's response to the RAI is provided in the Enclosure.

No regulatory commitments are contained in this letter.

Please refer any questions regarding this submittal to Mr. Lee Grzeck, Manager - Regulatory Affairs, at (910) 832-2487.

Sincerely,

Bryan B. Wooten
Director – Organizational Effectiveness
Brunswick Steam Electric Plant

BBW/mkb

Enclosure:

Response to Request for Additional Information

cc:

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Response to Request for Additional Information

By letter dated January 23, 2018, Duke Energy Progress, LLC (Duke Energy), submitted a relief request (i.e., ISI-09) for the Brunswick Steam Electric Plant (BSEP), Unit Nos. 1 and 2. The request proposed an alternative to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, 2001 Edition through 2003 Addenda. Specifically, to Table IWB-2500-1, Category B-A, Item B1.11 for examination of reactor pressure vessel (RPV) circumferential shell welds.

On March 15, 2018, by electronic mail, the NRC provided a request for additional information (RAI) regarding the ISI-09 relief request. Those questions, and Duke Energy's responses, are provided below.

Apparent Technical Deficiency

In Section 6 “Basis for Use” of the enclosure to the submittal, the licensee included Table 4.2.5-1 “Comparison of NRC and CP&L 54 EFPY Mean ΔRT_{NDT} Calculations to the 64 EFPY Mean ΔRT_{NDT} Calculations for the Limiting CB&I Case Study on BWRVIP-05” of NUREG-1856 “Safety Evaluation Report Related to the License Renewal of the Brunswick Steam Electric Plant, Units 1 and 2” as the basis for the proposed alternative. Table 4.2.5-1 of NUREG-1856 summarizes the results of the time-limited aging analysis (TLAA) for the RPV circumferential shell welds. The NRC staff noted that it approved the licensee’s circumferential weld TLAA summarized in Table 4.2.5-1 of NUREG-1856 in 2006 during the approval of NUREG-1856. The NRC staff is concerned that surveillance capsule test data that are withdrawn and/or tested after 2006 can potentially impact the values in Table 4.2.5-1 of NUREG-1856, and therefore invalidate them, especially values of mean ΔRT_{NDT}. The NRC staff therefore reviewed the capsule withdrawal schedule in the current licensing basis of BSEP, Units 1 and 2. This capsule withdrawal schedule is contained in the integrated surveillance program (ISP) in BWRVIP-86, Revision 1-A, as indicated in Section 5.3.1.6 “Material Surveillance” of the updated final safety analysis report. The NRC staff noted that the licensee updated the fluence values in November 2012, as stated in the submittal. However, it cannot verify whether this update was due to the capsule tests scheduled for BSEP, Units 1 and 2, consistent with the ISP in BWRVIP-86, Revision 1-A, because the licensee did not provide further information about the November 2012 update on fluence values.

NRC RAI

a) State whether the updated fluence values in November 2012 were due to the capsule tests scheduled for BSEP, Units 1 and 2, consistent with BWRVIP-86, Revision 1-A. If the updated fluence values in November 2012 were not due to the scheduled capsule tests, summarize the results of the scheduled capsule tests with regards to how the results impact the values in Table 4.2.5-1 of NUREG-1856.

b) Confirm that the methodology used to calculate the updated fluence values in November 2012 is consistent with NRC-approved methodology.

Response to NRC RAI (a)

The updated fluence values in November 2012 were not related to capsule tests for BSEP Units 1 and 2. BSEP has replaced the original RPV material surveillance program with the

Boiling Water Reactor Vessel and Internals Project (BWRVIP) Integrated Surveillance Program (ISP). BSEP is currently committed to use the BWRVIP ISP, and has made a license renewal commitment to use the ISP for BSEP during the period of extended operation. The BWRVIP ISP meets the requirements of 10 CFR 50, Appendix H, for Integrated Surveillance Programs, and has been approved by the NRC. Use of the BWRVIP ISP for BSEP was approved by the NRC on January 14, 2004 (i.e., Reference 1). Under the ISP, no further capsules are scheduled for removal from the BSEP Unit 1 and 2 vessels.

Neutron fluence values were updated in November 2012 as part of BSEP's report, WCAP-17660-NP, *Neutron Exposure Evaluations for Core Shroud and Pressure Vessel Brunswick Units 1 and 2* (i.e., Reference 2). This report evaluated neutron exposure of materials based on the actual operating data for the first 18 operating cycles of BSEP Unit 1 and first 19 operating cycles of BSEP Unit 2. Future operations to 32 and 54 effective full power years (EFPY) were performed, and neutron exposure projections were developed to 32 and 54 EFPY of operation.

Response to NRC RAI (b)

The methodology used in the calculation of the November 2012 updated fluence values is consistent with NRC-approved methodology. This methodology has been applied to BSEP Units 1 and 2 in the past and was previously accepted by the NRC (i.e., Reference 3) as being compliant with Regulatory Guide 1.190.

References:

1. Letter from Margaret H. Chernoff (NRC) to C.J. Gannon (CP&L), *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)*, dated January 14, 2004, ADAMS Accession Number ML040150192

2. Westinghouse Report WCAP-17660-NP, Revision 0, *Neutron Exposure Evaluations for Core Shroud and Pressure Vessel Brunswick Units 1 and 2*, dated November 2012.

3. Letter from Brenda L. Mozafari (NRC) to J.S. Keenan (CP&L), *Brunswick Steam Electric Plant, Units 1 and 2 – Issuance of Amendment Re: Pressure Temperature Limit Curves (TAC Nos. MB5579 and MB5580)*, dated June 18, 2003, ADAMS Accession Number ML031690683