



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 6, 2021

Mr. Steve Snider
Vice President
Nuclear Engineering
Duke Energy
526 South Church Street, EC-07H
Charlotte, NC 28202

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2; CATAWBA NUCLEAR STATION, UNITS 1 AND 2; H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT 2; MCGUIRE NUCLEAR STATION, UNITS 1 AND 2; OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3; AND SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1 – REQUEST FOR USE OF A LATER EDITION OF ASME BOILER AND PRESSURE VESSEL CODE, SECTION XI FOR REPAIR AND REPLACEMENT ACTIVITIES (EPID L-2020-LLR-0124)

Dear Mr. Snider:

The U.S. Nuclear Regulatory Commission (NRC) has approved your request to use a provision of a later edition of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, for Brunswick Steam Electric Plant, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2; H. B. Robinson Steam Electric Plant, Unit 2; McGuire Nuclear Station, Units 1 and 2; Oconee Nuclear Station, Units 1, 2, and 3; and Shearon Harris Nuclear Power Plant, Unit 1. This action is in response to your request RA-20-0263, dated September 16, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20260H326), as supplemented by the letter dated February 11, 2021 (ADAMS Accession No. ML21042A001).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g)(4)(iv), Duke Energy Carolinas, LLC and Duke Energy Progress, LLC (hereafter referred to collectively as Duke Energy), proposed to use paragraph IWA-4340 in the 2017 Edition of ASME Boiler and Pressure Vessel Code (ASME Code), Section XI for repair and replacement activities for ASME Code Class 2 and 3 components. The licensee will use the provisions in IWA-4340 with the conditions specified in 10 CFR 50.55a, paragraph (b)(2)(xxv)(B).

The NRC staff approves the use of paragraph IWA-4340 in the 2017 Edition of ASME Code, Section XI, as incorporated by reference in 10 CFR 50.55a, for the remainder of the Fourth 10-Year ISI interval for Catawba Nuclear Station, Units 1 and 2; McGuire Nuclear Station, Units 1 and 2; and Shearon Harris Nuclear Power Plant, Unit 1; and the remainder of the Fifth 10-Year ISI interval for Brunswick Steam Electric Plant, Units 1 and 2; H. B. Robinson Steam Electric Plant, Unit 2; and Oconee Nuclear Station, Units 1, 2, and 3.

All other ASME B&PV Code, Section XI, requirements which are not modified by the NRC staff's approval of the licensee's request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

If you have any questions, please contact Michael Mahoney at 301-415-3867 or via email at Michael.Mahoney@nrc.gov.

Sincerely,

David J. Wrona, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-261, 50-269, 50-270,
50-287, 50-324, 50-325,
50-369, 50-370, 50-400,
50-413, and 50-414

Enclosure:
Safety Evaluation

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SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2; CATAWBA NUCLEAR STATION, UNITS 1 AND 2; H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT 2; MCGUIRE NUCLEAR STATION, UNITS 1 AND 2; OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3; AND SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1 – REQUEST TO USE A PROVISION OF A LATER EDITION OF ASME BOILER AND PRESSURE VESSEL CODE, SECTION XI, FOR REPAIR AND REPLACEMENT ACTIVITIES (EPID L-2020-LLR-0124) DATED MAY 6, 2021

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REQUEST RA-20-0263 – REQUEST FOR USE OF IWA-4340 OF A LATER EDITION OF
ASME BOILER AND PRESSURE VESSEL CODE, SECTION XI FOR
REPAIR AND REPLACEMENT ACTIVITIES
DUKE ENERGY CAROLINAS, LLC
CATAWBA NUCLEAR STATION, UNITS 1 AND 2
MCGUIRE NUCLEAR STATION, UNITS 1 AND 2
OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3
DUKE ENERGY PROGRESS, LLC
BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT 2
SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1
DOCKET NOS. 50-413, 50-414, 50-369, 50-370,
50-269, 50-270, 50-287, 50-324, 50-325, 50-261, and 50-400

1.0 INTRODUCTION

By letter RA-20-0263, dated September 16, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20260H326), as supplemented by the letter dated February 11, 2021 (ADAMS Accession No. ML21042A001). Duke Energy Carolinas, LLC, and Duke Energy Progress, LLC (Duke Energy or the licensee) requested U.S. Nuclear Regulatory Commission (NRC) approval to use paragraph IWA-4340 in the 2017 Edition of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI for repair and replacement activities for ASME Code Class 2 and 3 components, for Brunswick Steam Electric Plant, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2; McGuire Nuclear Station, Units 1 and 2; Oconee Nuclear Station, Units 1, 2, and 3; H. B. Robinson Steam Electric Plant, Unit 2; and Shearon Harris Nuclear Power Plant, Unit 1.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g)(4)(iv), the licensee proposed to use paragraph IWA-4340 in the 2017 Edition of ASME Boiler and

Pressure Vessel Code (ASME Code), Section XI for repair and replacement activities for ASME Code Class 2 and 3 components. The licensee will use the provisions in IWA-4340 with the conditions specified in 10 CFR 50.55a, paragraph (b)(2)(xxv)(B).

2.0 REGULATORY EVALUATION

Regulatory Requirements

The licensee is proposing to use a section of a later edition and addenda of the ASME B&PV Code, Section XI, in accordance with 10 CFR 50.55a(g)(4)(iv), "Applicable ISI [inservice inspection] Code: Use of subsequent Code editions and addenda," which states:

Inservice examination of components and system pressure tests may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (a) of this section, subject to the conditions listed in paragraph (b) of this section, and subject to Commission approval. Portions of editions or addenda may be used, provided that all related requirements of the respective editions or addenda are met.

Given that 10 CFR 50.55(g)(4)(iv) permits the NRC to approve the use of subsequent ASME B&PV Code edition and addenda, the NRC staff finds that subject to the following technical evaluation, the licensee may propose to use a section of a later edition and addenda of the ASME B&PV Code, Section XI, and the NRC staff has the regulatory authority to approve the later edition and addenda of the ASME B&PV Code, Section XI.

Guidance

NRC Regulatory Issue Summary (RIS) 2004-16, "Use of Later Editions and Addenda to ASME Code Section XI for Repair/Replacement Activities," addresses the provisions for use of later editions and addenda of the ASME Code.

3.0 NRC TECHNICAL EVALUATION

3.1 ASME Code Components Affected

The proposed request applies to Class 2 and 3 pressure retaining components.

3.2 Applicable ASME Code Edition and Addenda

The current Code of Record for the subject reactor units is the 2007 Edition of the ASME Code, Section XI through 2008 Addendum. The licensee requested the use of provisions of IWA-4340 in the 2017 Edition of ASME Code, Section XI.

3.3 Duration of the Use of the Later Code Edition and Addenda

The licensee is requesting approval of this proposed alternative for the remainder of the 10-year ISI intervals, as shown in Table 1 below.

Table 1

Plant/Unit(s)	ISI Interval	Interval Start Date	Current Planned Interval End Date
Brunswick Steam Electric Plant, Units 1 and 2	Fifth	05/11/2018	05/10/2028
Catawba Nuclear Station, Units 1 and 2	Fourth	08/19/2015	12/06/2024 (Unit 1) 02/24/2026 (Unit 2)
H. B. Robinson Steam Electric Plant, Unit 2	Fifth	07/21/2012	02/19/2023
McGuire Nuclear Station, Units 1 and 2	Fourth	12/01/2011 (Unit 1) 07/15/2014 (Unit 2)	11/30/2021 (Unit 1) 02/29/2024 (Unit 2)
Oconee Nuclear Station, Units 1, 2, and 3	Fifth	07/15/2014	07/15/2024
Shearon Harris Nuclear Power Plant, Unit 1	Fourth	09/09/2017	09/08/2027

3.6 Technical Evaluation

The licensee requested the use provisions of IWA-4340 in the 2017 Edition of ASME Code, Section XI, which addresses mitigation of defects by modification for Class 2 and 3 components. The mitigation is performed to contain or isolate a defective area without removal of defects. Specifically, subparagraphs (a) through (h) of IWA-4340 describe the ASME Code requirements for the repair and replacement activities. As further discussed below, the regulation in 10 CFR 50.55a allows the use of IWA-4340 with the conditions specified in paragraphs (b)(2)(xxv)(A) and (B) of 10 CFR 50.55a.

The NRC staff also considered the following criteria in its review of the licensee's request:

- 1) The proposed edition/addendum of the ASME Code is incorporated by reference in 10 CFR 50.55a(a).
- 2) The proposed edition/addendum of the ASME Code is subject to the conditions listed in 10 CFR 50.55a(b).
- 3) The licensee shall request Commission approval to use the proposed edition and addenda of the ASME Code.
- 4) If only portions of editions or addenda are to be used, all related requirements of the respective editions or addenda must be met.

In the evaluation of the first criterion, the NRC staff notes that the licensee proposed to use IWA-4340 in the 2017 Edition of ASME Code, Section XI. The use of IWA-4340 is addressed in a final rule for 10 CFR 50.55a published in the *Federal Register* on May 4, 2020 (85 FR 26540). In the rule, the 2017 Edition of ASME Code, Section XI has been incorporated by reference in 10 CFR 50.55a(a). Therefore, the NRC staff finds that the first criterion has been satisfied.

In the evaluation of the second criterion, the NRC staff notes that paragraph (b)(2)(xxv)(A) of 10 CFR 50.55a specifies the editions and addenda that can be used in the implementation of the provisions in IWA-4340. Specifically, the condition permits the use of IWA-4340 in the 2017

Edition of ASME Code, Section XI. The NRC staff finds that the licensee's request is consistent with the condition in paragraph (b)(2)(xxv)(A) of 10 CFR 50.55a because the licensee's request specifies the use of IWA-4340 in the 2017 Edition of ASME Code, Section XI.

In addition, paragraph (b)(2)(xxv)(B) in 10 CFR 50.55a describes other conditions, which are required for the implementation of IWA-4340. These conditions address the following aspects of the implementation of IWA-4340: (1) defects for which the use of IWA-4340 is prohibited (i.e., crack-like defects and defects associated with flow accelerated corrosion); (2) adequate loss-of-material rates for the design of the modification; and (3) examination of the pipe wall thickness in the vicinity of the modification and relevant pipe base metal to ensure structural integrity. In its request, the licensee proposed to use IWA-4340 in accordance with these conditions as specified in 10 CFR 50.55a, paragraph (b)(2)(xxv)(B).

As discussed above, the NRC staff finds that the licensee's request is consistent with the conditions in paragraphs (b)(2)(xxv)(A) and (B) of 10 CFR 50.55a and, therefore, the second criterion has been satisfied.

In the evaluation of the third criterion, the NRC staff notes that the licensee's request constitutes a request to the Commission for approval to use subsequent editions and addenda of the ASME Code. The licensee's request is also consistent with the guidance in RIS 2004-16. Therefore, the NRC staff finds that the third criterion has been satisfied.

In the evaluation of the fourth criterion, the NRC staff notes that the licensee's use of IWA-4340 must meet all related requirements of the 2017 Edition of ASME Code, Section XI that the licensee proposed to use. In the supplement dated February 11, 2021, the licensee acknowledged this requirement and stated that "Duke Energy's use of paragraph IWA-4340 will meet all related requirements of ASME Code, Section XI, 2017 Edition." Therefore, the NRC staff finds that the fourth criterion has been satisfied.

3.7 Technical Evaluation Summary

Based on the above evaluation, the NRC staff finds that the criteria contained in 10 CFR 50.55a(g)(4)(iv) are satisfied. Accordingly, the NRC staff finds that the licensee's use of IWA-4340 in the 2017 Edition of ASME Code, Section XI is acceptable for the remainder of the following ISI intervals at the licensee's reactor units as described in Table 1 in Section 3.3 of this safety evaluation.

4.0 CONCLUSION

As set forth above, NRC staff finds that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(g)(4)(iv). Therefore, the NRC staff concludes that the use of paragraph IWA-4340 of the 2017 Edition of the ASME B&PV Code, Section XI, is acceptable. The NRC staff, therefore, approves the use of paragraph IWA-4340 of the 2017 Edition of the ASME B&PV Code, Section XI for the remainder of the Fourth 10-Year ISI interval for Catawba Nuclear Station, Units 1 and 2; McGuire Nuclear Station, Units 1 and 2; and Shearon Harris Nuclear Power Plant, Unit 1; and the remainder of the Fifth 10-Year ISI interval for Brunswick Steam Electric Plant, Units 1 and 2; H. B. Robinson Steam Electric Plant, Unit 2; and Oconee Nuclear Station, Units 1, 2, and 3.

All other ASME B&PV Code, Section XI, requirements which are not modified by the NRC staff's approval of the licensee's request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributors: S. Min, NRR

Date: May 6, 2021