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10 CFR 50.55a

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

Catawba Nuclear Station, Unit No. 2  
Renewed Facility Operating License No. NPF-52  
Docket No. 50-414

**SUBJECT: Proposed Alternative to Use ASME Code Case N-885 for Catawba Nuclear Station Unit 2**

Ladies and Gentlemen:

Pursuant to 10 CFR 50.55a(z)(1), Duke Energy Carolinas, LLC (Duke Energy) requests U.S. Nuclear Regulatory Commission (NRC) approval of a proposed alternative to the American Society of Mechanical Engineers (ASME) Code, Section XI, Article IWB-2500(a), Table IWB-2500-1 (B-N-1, B-N-2, and B-N-3) and Article IWB-3520 requirements for examinations of the reactor vessel (RV) interior surfaces, RV interior attachments, and core support structures at Catawba Nuclear Station Unit 2 (CNS). Specifically, Duke Energy is requesting to implement ASME Code Case N-885 in lieu of the requirements described above. Enclosure 1 contains details regarding this request.

Duke Energy requests approval of the proposed alternative within one year of acceptance by the NRC. Should you have any questions concerning this letter and its enclosure, please contact Art Zaremba, Director - Nuclear Fleet Licensing at (980) 373-2062.

Sincerely,

Tom Simril  
Vice President, Catawba Nuclear Station

Enclosure:

1. Proposed Alternative to Utilize ASME Code Case N-885

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cc:

L. Dudes, USNRC, Region II Regional Administrator  
K. Cotton, USNRC NRR Project Manager for CNS  
J. Austin, USNRC Senior Resident Inspector for CNS

**Enclosure 1**

**Proposed Alternative to Utilize ASME Code Case N-885**

**1.0 ASME CODE COMPONENT(S) AFFECTED:**

All ASME reactor vessel interior Examination Category B-N-1, B-N-2, and B-N-3, Item Number B13.10, B13.50, B13.60, and B13.70 accessible areas, welds, and surfaces required to be examined.

**2.0 APPLICABLE CODE EDITION AND ADDENDA:**

The applicable Edition and Addenda of the ASME Code, Section XI is identified in Table 1.

**Table 1**

<b>Plant/Unit(s)</b>	<b>ISI Interval</b>	<b>ASME Section XI Code Edition/Addenda</b>	<b>Interval Start Date</b>	<b>Interval End Date<sup>1</sup></b>
Catawba Nuclear Station Unit 2	Fourth	2007 Edition, Through 2008 Addenda	08/19/2015	02/24/2026

**Notes:**

1. The Interval End Date is subject to change in accordance with IWA-2430(c)(1).

**3.0 APPLICABLE CODE REQUIREMENT:**

ASME Code, Section XI, IWB-2500(a), Table IWB-2500-1 (B-N-1, B-N-2, B-N-3) and IWB-3520, of the 2007 Edition with the 2008 Addenda provide requirements and acceptance standards for performing VT-1 or VT-3 examination of the reactor vessel interior surfaces, reactor vessel interior attachments, and core support structures.

**4.0 REASON FOR REQUEST:**

In accordance with 10 CFR 50.55a(z)(1), Duke Energy is requesting proposed alternatives from the current ASME Section XI, IWB-2500(a), Table IWB-2500-1 (B-N-1, B-N-2, and B-N-3) and IWB-3520 requirements for performing VT-1 or VT-3 examination of the reactor vessel interior surfaces, reactor vessel interior attachments, and core support structures. Compliance with the ASME Code results in additional personnel safety and radiation dose concerns, additional opportunity to introduce foreign material into the reactor vessel and could result in additional outage critical path time that could be avoided. Furthermore, the requirements for many of these examinations were developed decades ago due to concerns, events, or assumptions that no longer apply today. Additionally, the current exam requirements are vague and have been implemented in various ways across the U.S. Nuclear Fleet.

ASME Code Case N-885 was approved December 4, 2018 by the ASME Board on Nuclear Codes and Standards [Reference 8.1]. The case has not yet been incorporated into NRC Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," and thus is not available for application at nuclear power plants without specific NRC approval; therefore, Duke Energy requests use of the alternative examination requirements described in this Case via this relief request.

## 5.0 **PROPOSED ALTERNATIVE AND BASIS FOR USE:**

### Proposed Alternative is as Follows:

Duke Energy proposes to implement the requirements of ASME Code Case N-885 in lieu of the requirements of Section XI, IWB-2500(a), Table IWB-2500-1 (B-N-1, B-N-2, B-N-3), and IWB-3520. The Code Case has eliminated Table IWB-2500-1 (B-N-1, B-N-2, B-N-3), Item Number B13.10 VT-3 examinations and associated acceptance standards. The current code technical requirements concerning Examination Category B-N-2 and B-N-3, Item Numbers B13.50, B13.60, and B13.70 examinations and associated acceptance standards are retained but with modified Examination Category and Item Number assignments.

### The Basis for the Proposed Alternative is as Follows:

The Electric Power Research Institute (EPRI) commissioned a study to assess the benefit and basis for performing Examination Category B-N-1 VT-3 examinations. The study is documented in EPRI report 3002012966, "Evaluation of Basis for Periodic Visual Examination of Accessible Areas of Reactor Vessel Interior per Examination Category B-N-1 of ASME Section XI, Division 1" [Reference 8.2]. The report concluded that the purpose of B-N-1 examinations is to detect foreign material and debris and that other industry requirements and guidance are sufficient for detecting foreign material or debris in the reactor vessel. Foreign material and debris examinations such as core plate Foreign Object Search and Retrieval (FOSAR) prior to fuel load and core verification after fuel load are performed during each refueling outage. The EPRI report is the technical basis used for ASME approval of Code Case N-885.

The EPRI report identified that industry foreign material control work practices reduce the amount of foreign objects and debris that could be introduced as a result of human error. The concern for the effects of foreign material and debris within the reactor vessel are adequately addressed by the routine Core Verification FOSAR activities that are performed during refueling outages. If foreign material or debris is observed, maintenance practices are established to either remove the foreign material, or evaluate the consequences if not removing, prior to the reactor vessel head closure. These activities occur each refueling which is more frequent than the current code requirement of each inspection period and provide appropriate processes to adequately address detrimental foreign material within the reactor vessel. In addition, there are numerous other activities that occur during refueling outages that provide opportunities for detecting adverse conditions in the interior of the reactor vessel such as:

- FOSAR, which is performed during refueling outages.
- Core verification activities.
- PWR internals examinations performed during the period of extended operation per MRP-227.
- Other Section XI examinations including Examination Categories B-A, B-D, B-N-2, and B-N-3. The current code B-N-2 and B-N-3 examinations will continue under Case N-885 as Examination Category B-N, Item Numbers B13.10, B13.20, B13.30, and B13.40.

- Reactor vessel internals component maintenance and inspection activities such as normal component movement to support refueling, and industry and Nuclear Steam Supply System (NSSS) or fuel supplier bulletin inspections.

The above outage activities provide opportunities for the detection of foreign materials or accumulation of corrosion products as well as other adverse conditions in the interior of the reactor vessel. Further, the Duke Energy Foreign Material Exclusion (FME) program provides the governing requirements for maintaining FME integrity by preventing introduction of foreign materials into systems, structures, or components as well as controls for investigation and recovery of items when FME integrity is lost or unexpected foreign material (FM) is discovered.

The proposed alternative to utilize Code Case N-885 eliminates the acceptance standards of ASME Section XI, IWB-3520.2(c), "foreign materials or accumulation of corrosion products that could interfere with control rod motion or could result in blockage of coolant flow through the fuel." This is done within the Code Case to parallel the removal of the Category B-N-1 vessel interior visual examination, as the IWB-3520.2(c) provision only applies to the removed visual exam of the reactor vessel interior accessible areas.

All other ASME Section XI requirements for which relief was not specifically requested and authorized by the NRC Staff will remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

The Duke Energy Corrective Action Program would be utilized if conditions that could interfere with control rod motion or result in blockage of coolant flow through reactor fuel were identified. Duke Energy is required to have a corrective action program that fulfills regulatory requirements. Specifically, 10 CFR 50 Appendix B, Criterion XVI requires that Conditions Adverse to Quality are corrected. To meet this requirement, Duke Energy utilizes Computer Programs and administrative procedures to document the corrective actions that address the Conditions Adverse to Quality. This relief request does not alter these requirements. The Duke Energy Corrective Action Program also ensures compliance with Technical Specification requirements (e.g., operability definition, limiting conditions for operations, surveillance requirements) related to control rods, reactor fuel, and the emergency core cooling system.

The NRC has recently published Draft Regulatory Guide DG-1367, "Proposed Revision 20 to Regulatory Guide 1.147" Issue Date: January 2021 (ML20120A631) and has included ASME Code Case N-885 in Table 1: Acceptable Section XI Code Cases [Reference 8.3].

The proposed alternative to utilize ASME Code Case N-885 provides an acceptable level of quality and safety based on numerous activities that occur each refueling outage, more frequently than that of the current ASME Section XI requirement of each inspection period.

## **6.0 DURATION OF PROPOSED ALTERNATIVE:**

This alternative is requested for the duration of the current inservice inspection interval listed in Table 1 of this request.

**7.0 PRECEDENTS:**

- 7.1 **ADAMS Accession Number ML21039A636. NRC approval dated February 17, 2021.** Braidwood Station, Units 1 and 2; Byron Station, Unit Nos. 1 and 2; Calvert Cliffs Nuclear Power Plant, Units 1 and 2; and R.E. Ginna Nuclear Power Plant – Proposed Alternative to use the American Society of Mechanical Engineers Boiler and Pressure Vessel Code Case N-885 (EPID L-2020-LLR-0069).

**8.0 REFERENCES:**

- 8.1 ASME Section XI, Division 1, Code Case N-885, “Alternative Requirements for Table IWB-2500-1, Examination of Category B-N-1, Interior of Reactor Vessel, Category B-N-2, Welded Core Support Structures and Interior Attachments to Reactor Vessels, Category B-N-3, Removeable Core Support Structures” dated December 4, 2018.
- 8.2 Evaluation of Basis for Periodic Visual Examination of Accessible Areas of Reactor Vessel Interior per Examination Category B-N-1 of ASME Section XI, Division 1. EPRI, Palo Alto, CA: 2018. 3002012966. (*Publicly Available*).
- 8.3 Draft Regulatory Guide DG-1367, “Proposed Revision 20 to Regulatory Guide 1.147” Issue Date: January 2021 (ADAMS Accession Number ML20120A631).