



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

July 3, 2023

Mr. Steven M. Snider
Site Vice President
Oconee Nuclear Station
Duke Energy Carolinas, LLC
7800 Rochester Highway
Seneca, SC 29672-0752

SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 – AUDIT PLAN
RE: PROPOSED ALTERNATIVE TO USE ASME CODE CASE N-752,
“RISK-INFORMED CATEGORIZATION AND TREATMENT FOR
REPAIR/REPLACEMENT ACTIVITIES IN CLASS 2 AND 3 SYSTEMS
SECTION XI, DIVISION 1” (EPID L-2022-LLR-0060)

Dear Mr. Snider:

By letter dated July 27, 2022, as supplemented by letter dated March 9, 2023, Duke Energy Carolinas, LLC (Duke Energy, the licensee) submitted a licensing action request to authorize a proposed alternative to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code, Section XI, “Rules for Inservice Inspection of Nuclear Power Plant Components.” Specifically, the licensing action proposes to use the alternative requirements of ASME Code Case N-752, “Risk-Informed Categorization and Treatment for Repair/Replacement Activities in Class 2 and 3 Systems Section XI, Division 1,” for determining the risk-informed categorization and implementing alternative treatment for repair/replacement activities on moderate- and high-energy Class 2 and 3 items instead of ASME Code Section XI, paragraphs IWA-1000, IWA-4000, and IWA 6000 requirements.

A clarification call was held on June 12, 2023, to ensure mutual understanding of a draft request for additional information contained in the Enclosure to this Audit Plan. As a result of the clarification call, the U.S. Nuclear Regulatory Commission (NRC) staff and Duke Energy agreed to a regulatory audit to gain a better understanding of the issues identified in the Enclosure and to identify information that may require docketing to support the basis of the NRC staff’s licensing decision.

The virtual audit will begin on August 1, 2023, and be conducted in accordance with Office of Nuclear Reactor Regulation Office Instruction LIC-111, “Regulatory Audits.” It is anticipated the audit will conclude on or before August 28, 2023.

S. Snider

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If you have any questions, please contact me by telephone at (301) 415-1009 or via e-mail at Shawn.Williams@nrc.gov.

Sincerely,

Shawn A. Williams, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosures:

1. Audit Plan
2. Draft Request for Additional Information

cc: Listserv



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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REGULATORY AUDIT PLAN

TO SUPPORT REVIEW OF PROPOSED ALTERNATIVE REQUEST

FOR OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 TO USE CODE CASE N-752 FOR

DETERMINING RISK INFORMED CATEGORIZATION AND TREATMENT FOR

REPAIR/REPLACEMENT ACTIVITIES IN CLASS 2 AND 3 SYSTEMS

DOCKET NOS. 50-269, 50-270, AND 50-287

1.0 BACKGROUND

By letter dated July 27, 2022 (Agencywide Documents Access and Management System Accession No. ML22208A031), as supplemented by letter dated March 9, 2023 (ML23068A015), Duke Energy Carolinas, LLC (Duke Energy, the licensee) submitted a licensing action request to authorize a proposed alternative to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." Specifically, the licensing action proposes to use the alternative requirements of ASME Code Case N-752, "Risk-Informed Categorization and Treatment for Repair/Replacement Activities in Class 2 and 3 Systems Section XI, Division 1," for determining the risk-informed categorization and implementing alternative treatment for repair/replacement activities on moderate- and high-energy Class 2 and 3 items instead of ASME Code Section XI, paragraphs IWA-1000, IWA-4000, and IWA-6000 requirements.

A clarification call was held on June 12, 2023, to ensure mutual understanding of a draft request for additional information (RAI) contained in the Enclosure to this Audit Plan. As a result of the clarification call, the U.S. Nuclear Regulatory Commission (NRC) staff and Duke Energy agreed to a regulatory audit to gain a better understanding of the issues noted in the Enclosure and to identify information that may require docketing to support the basis of the NRC staff's licensing decision.

2.0 REGULATORY AUDIT BASIS

The NRC staff (i.e., audit team) will perform the audit to support its evaluation of the alternative request to ensure that it would provide an acceptable level of quality and safety in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1).

The virtual audit will be conducted in accordance with Office of Nuclear Reactor Regulation Office Instruction LIC 111, "Regulatory Audits", Revision 1 (ML19226A274).

3.0 REGULATORY AUDIT SCOPE AND METHODOLOGY

The audit team and Duke Energy staff will discuss the technical issues identified in the Enclosure. The NRC staff will review, as needed, the licensee's records, analyses, and calculations related to the proposed alternative.

The audit team will determine whether any additional information contained in the records, analyses, and calculations, will need to be submitted or supplemented on the docket to support a regulatory decision.

4.0 INFORMATION AND OTHER MATERIAL NECESSARY FOR THE AUDIT

The Enclosure includes a draft RAI that will be the primary focus of the Audit. The audit team requests that information to support discussions be readily available and accessible for the audit team's review via a Web-based portal (portal) to be established by Duke Energy. Information accessed through the licensee's portal will not be held or retained in any way by the NRC staff.

Throughout the audit, the NRC staff and Duke Energy may add documents to the portal as needed to support audit discussions. The NRC staff will reference all documents on the portal as an enclosure to the Audit Summary Report, which will be publicly available.

5.0 TEAM ASSIGNMENTS

The audit team will consist of the following NRC staff:

- Jigar Patel, Team Leader, and Senior Reliability and Risk Analyst
- Ching Ng, Senior Reliability and Risk Analyst
- Jay Collins, Senior Materials Engineer
- John Honcharik, Senior Materials Engineer
- Shawn Williams, Senior Project Manager
- Zach Turner, Project Manager

6.0 LOGISTICS

The audit will be conducted virtually with an opening meeting planned for August 1, 2023. August 7 and 8 have been scheduled for additional opportunities for audit discussions, as needed. Additional dates for audit discussions will be coordinated, as needed. It is anticipated the audit will conclude on or before August 28, 2023.

Prior to the first meeting, Duke Energy will establish a portal and populate, as appropriate, to support the discussions on August 1, 2023. Duke Energy will provide audit team members access to the online portal. The virtual audit will begin when NRC staff has access to the portal and the first document is posted.

During the audit period, the audit team may request that the licensee respond to questions related to information provided on the portal at mutually agreeable days and times by virtual and/or telephone meetings. It is important that licensee staff who are knowledgeable about the alternative request and topics in the Audit be available during the audit period.

NRC staff access to the portal may be terminated after completion of the audit at a time agreed between the audit team and Duke Energy. The NRC Project Manager will coordinate any changes to the audit schedule with the licensee.

7.0 SPECIAL REQUESTS

The following conditions associated with the portal must be maintained while the NRC staff have access to the online portal:

- The portal will be password-protected. A separate password will be assigned to each member of the NRC staff participating in the audit.
- The portal will prevent the audit team from printing, saving, downloading, copying or collecting any information directly from the portal.
- Conditions of use of the portal will be displayed on the login screen and will require acknowledgment by each user.

Username and password information should be provided directly to members of the audit team. The Project Manager will provide the licensee any needed contact information for the audit team. All other communications should be coordinated through the Project Manager.

8.0 DELIVERABLES

An audit summary, which will be publicly available, will be prepared within 30 days of the completion of the audit. If the NRC staff identifies information during the audit that is needed to support its regulatory decision, the NRC staff will issue requests for additional information to the licensee.

DRAFT REQUEST FOR ADDITIONAL INFORMATION

ALTERNATIVE REQUEST (RA-22-0174) TO USE ASME CODE CASE N-752

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DUKE ENERGY CAROLINAS, LLC

DOCKET NOS. 50-269, 50-270 AND 50-287

In its relief request, Duke Energy proposes to implement the risk-informed categorization and treatment requirements of ASME Code Case N-752 when performing repair/replacement activities on Class 2 and 3 pressure-retaining items or their associated supports. Duke Energy stated that Code Case N-752 employs a comprehensive categorization process requiring input from both a probabilistic risk assessment (PRA) model and deterministic insights. It further stated that:

This approach will enable [Duke's] evaluation, categorization, and implementation of alternative treatments for resolution of emergent issues in segments of piping having low safety significance. Use of Code Case N-752 will also allow Duke Energy to identify and more clearly focus engineering, maintenance, and operations resources on critical components with high safety-significance, thus, enabling Duke Energy to make more informed decisions and increase the safety of the plant.

Duke Energy requests approval on the basis that the proposed alternative provides an acceptable level of quality and safety in accordance with 10 CFR 50.55a(z)(1). The licensee stated that "The categorization and treatment requirements of Code Case N-752 are consistent with those in 10 CFR 50.69." The NRC staff evaluated Duke Energy's plant-specific relief request to assess the sufficiency of the proposed use of Code Case N-752, for repair/replacement of Class 2 and 3 pressure-retaining items or their associated supports, employs a comprehensive categorization process. The NRC staff further evaluated whether the proposed use of Code Case N-752 would provide an acceptable level of quality and safety in accordance with 10 CFR 50.55a(z)(1).

The NRC staff notes Code Case N-752 is similar to ANO2-R&R-004 (ML090930246). The NRC issued safety evaluations approving adoption of 10 CFR 50.69 license amendments requests for implementing risk-informed categorizations to include the use of ANO2-R&R-004 (ML090930246) to categorize passive components within the 10 CFR 50.69 methodology framework. NRC Regulatory Guide (RG) 1.201, "Guidelines for Categorizing Structures, Systems, and Components in Nuclear Power Plants According to their Safety Significance," (ML061090627) provides a risk-informed method for establishing the requirements for treatment of SSCs (systems, structures and components) by categorizing SSCs according to their safety significance. RG 1.201 endorses NEI 00-04, "50.69 Categorization Guidelines," (ML052910035). The staff notes that there are some variances in Code Case N-752 with regard to incorporating the expected critical requirements of the methodology, as approved in the integrated decision-making process outlined in RG 1.201 and 10 CFR 50.69.

The NRC has concerns that Code Case N-752's approach to risk-informed SSC categorization does not appear to address the following attributes:

1. Code Case N-752 allows categorization on a component basis. As such, it appears that only deterministic insights are used to verify the impact of the passive component to other components in the system and function(s) the component(s) supports (active vs. passive functions). This may, for example, categorize passive features of components as low safety significant (LSS) if the active features of the component within the system are determined to be high safety significant (HSS). Based on this variance, it is not apparent that the plant-specific categorization and treatment using Code Case N-752's would maintain an acceptable level of quality and safety at the component and system level.
2. Section I-3.4.2(b)(1) of Code Case N-752 requires analysis and assessment of whether the failure of the pressure retaining function of the segment will directly or indirectly (e.g., through spatial effects) fail a basic safety function. Given that the active components within the system also play a significant role to establish the basic safety functions, an assessment of the risk significance of these active components would provide reasonable assurance that an acceptable level of quality and safety be maintained. The NRC staff noted that Code Case N-752 requires only Conditional Core Damage Probability (CCDP) (which can be estimated based on RAW values) as the risk screening criteria and conditional large early release probability (CLERP), given a specific failure (e.g., piping segment failure). Both RAW and Fussell-Vesely (F-V) are risk importance measures that uniquely highlight component significance to address basic safety functions. RAW importance reflects the increase in a selected figure of merit when an SSC is assumed to be unable to perform its function due to testing, maintenance, or failure. It is the ratio or interval of the figure of merit, evaluated with the SSC's basic event probability set to one. F-V importance is the fractional contribution to the total of a selected figure of merit for all accident sequences containing that basic event. The F-V importance measure is calculated by determining the fractional reduction in the total figure of merit brought about by setting the probability of the basic event to zero. The objective in applying the F-V criterion is to ensure that any entity that has an unusually large contribution to risk is identified, regardless of CDF or LERF. Based on the above, it is not apparent that the Code Case N-752's plant-specific approach of using only CCDP and CLERP is sufficient as risk screening criteria to provide an acceptable level of quality and safety.
3. Code Case N-752 Table I-2 provides a defense-in-depth matrix for evaluating consequence categories and frequency of events using a quantitative matrix of CCDP. Code Case N-752; however, allows either risk screening or defense-in-depth as noted in Section I-3.3.2 (a) (b) and (c): "Differences in the consequence rank between the use of Table I-1 [Table I-2, Table I-3] and Table I-5 shall be reviewed, justified and documented or the higher consequence rank assigned." Both defense-in-depth and risk screening criteria are essential for evaluating structures, systems and components (SSC) categorization. Based on the above, it is not apparent that the Code Case N-752's plant-specific approach would provide an acceptable level of quality and safety.

RAI No. 1

Based on Items 1-3 above, please justify the analytical basis to support the licensee's proposed plant-specific alternative or revise the proposed alternative specifically to address Items 1-3 above to provide an acceptable level of quality and safety for the risk-informed SSC categorization in accordance with 10 CFR 50.55a(z)(1).

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