Steven M. Snider
Vice President
Oconee Nuclear Station

Duke Energy
ON01VP | 7800 Rochester Hwy
Seneca, SC 29672

o: 864.873.3478
f: 864.873.5791
Steve.Snider@duke-energy.com

RA-22-0174 10 CFR 50.55a

July 27, 2022

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

Duke Energy Carolinas, LLC
Oconee Nuclear Station (ONS), Units 1, 2, and 3
Docket Numbers 50-269, 50-270, and 50-287
Renewed Facility Operating License Nos. DPR-38, DPR-47, and DPR-55

Subject: Proposed Alternative to Use American Society of Mechanical Engineers (ASME) Code Case N-752, "Risk-Informed Categorization and Treatment for Repair/Replacement Activities in Class 2 and 3 Systems Section XI, Division 1"

Pursuant to 10 CFR 50.55a(z)(1), Duke Energy Carolinas, LLC (Duke Energy) requests the U.S. Nuclear Regulatory Commission's (NRC) authorization of a proposed alternative to the ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components" for Oconee Nuclear Station (ONS), Units 1, 2, and 3, and Keowee Hydro Station, Units 1 and 2.

Specifically, Duke Energy is requesting 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 for implementing alternative treatment for repair/replacement activities on moderate and high energy Class 2 and 3 items in lieu of certain ASME Code Section XI, paragraph IWA-1000, IWA-4000, and IWA-6000 requirements. 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 proposed alternative is provided in the Enclosure to this submittal. Duke Energy requests NRC approval of the proposed alternative within one year of acceptance.

No regulatory commitments are contained in this submittal.

If there are any questions or if additional information is needed, please contact Mr. Ryan Treadway, Manager – Nuclear Fleet Licensing, at 980-373-5873.

Sincerely,

Steven M. Snider
Vice President
Oconee Nuclear Station

Enclosure: Request for Alternative in Accordance with 10 CFR 50.55a(z)(1) 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"

cc:

Ms. Laura Dudes, Administrator, Region II
U.S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, GA 30303-1257

Mr. Shawn Williams, Senior Project Manager
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, Maryland 20852

Mr. Jared Nadel
NRC Senior Resident Inspector
Oconee Nuclear Station

Enclosure

Duke Energy Carolinas, LLC

Oconee Nuclear Station, Units 1, 2, and 3

Keowee Hydro Station, Units 1 and 2

Relief Request Number RA-22-0174

Request for Alternative in Accordance with 10 CFR 50.55a(z)(1) 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"

1.0 ASME CODE COMPONENTS AFFECTED:

This request applies to ASME Class 2 and 3 items or components except the following:

1. Piping within the break exclusion region [> Nominal Pipe Size (NPS) 4 (DN 100)] for high energy piping systems[1] as defined by the Owner.
2. That portion of the Class 2 feedwater system [> NPS 4 (DN 100)] of pressurized water reactors (PWRs) from the steam generator (SG), including the SG, to the outer containment isolation valve.

This request does not apply to Class CC and MC items.

2.0 APPLICABLE CODE EDITION AND ADDENDA:

The current edition for the Inservice Inspection (ISI) interval for Oconee Nuclear Station (ONS) Units 1, 2, and 3 and Keowee Hydro Station, Units 1 and 2 is the American Society of Mechanical Engineers (ASME) Code, Section XI, 2007 Edition with the 2008 Addenda (Reference 8.1). All units are in the fifth inspection interval, which started on July 15, 2014 and is scheduled to end on July 15, 2024.

Per Regulatory Issue Summary (RIS) 2004-12 (Reference 8.2), Letter RA-20-0262 (Reference 8.17) and approval (Reference 8.3), the NRC staff concluded that the use of subparagraph IWA-4540(b) of the 2017 Edition of the ASME Boiler and Pressure Vessel (B&PV) Code, Section XI, is acceptable for Oconee.

Per RIS 2004-16, Letter RA-20-0263 (Reference 8.4) and approval (Reference 8.5), the NRC staff concluded that the use of subparagraph IWA-4340 of the 2017 Edition of the ASME B&PV Code, Section XI is acceptable for Oconee.

3.0 APPLICABLE CODE REQUIREMENTS:

3.1. ASME Code, Section XI, Subsection IWA provides the requirements for repair/replacement activities including the following:

- IWA-1320 specifies group classification criteria for applying the rules of ASME Section XI to various Code Classes of components. For example, the rules in IWC apply to items classified as ASME Class 2 and the rules in IWD apply to items classified as ASME Class 3.
- IWA-1400(f)[2] requires Owners to possess or obtain an arrangement with an Authorized Inspection Agency (AIA).
- IWA-1400(j)[2] requires Owners to perform repair/replacement activities in accordance with written programs and plans.
- IWA-1400(n)[2] requires Owners to maintain documentation of a Quality Assurance Program in accordance with 10 CFR 50 or ASME NQA-1, Parts II and III.
- IWA-4000 specifies requirements for performing ASME Section XI repair/replacement activities on pressure-retaining items or their supports.

- IWA-6210(d)[2] and (e)[2], specify Owner reporting responsibilities such as preparing Form NIS-2, Owner's Report for Repair/Replacement Activity.
- IWA-6350 specifies that the following ASME Section XI repair/replacement activity records must be retained by the Owner: evaluations required by IWA-4160 and IWA-4311, Repair/Replacement Programs and Plans, reconciliation documentation, and NIS-2 Forms.

NOTES:

1. NUREG-0800, Section 3.6.2 provides a method for defining this scope of piping.
2. Code Case N-752 is based on the 2017 Edition of ASME Section XI while Duke Energy's Code of record for ONS Units 1, 2, and 3 and Keowee Hydro Station, Units 1 and 2 is the 2007 Edition/2008 Addenda, except as noted in Section 2.0 of this request. Below is a cross reference for affected code paragraphs:
   - IWA-1400(g), (k), and (o) in the 2017 Edition are IWA-1400(f), (j), and (n) in the 2007 Edition/2008 Addenda.
   - IWA-6211(d) and (e) in the 2017 Edition are IWA-6210(d) and (e) in the 2007 Edition/2008 Addenda.
   - IWA-6211(f) and IWA-6212 in the 2017 Edition do not exist in or apply to the 2007 Edition/2008 Addenda.

4.0 REASON FOR REQUEST:

Duke Energy currently performs repair/replacement activities at ONS Units 1, 2, and 3 and Keowee Hydro Station, Units 1 and 2 in accordance with a deterministic Repair/Replacement Program based on the 2007 Edition/2008 Addenda of ASME Section XI. Repair/Replacement Program requirements apply to procurement, design, fabrication, installation, examination, and pressure testing of items within the scope of ASME Section XI. Repair/replacement activities include welding, brazing, defect removal, metal removal using thermal processes, rerating, and removing, adding, or modifying pressure-retaining items or supports. Repair/replacement activities are performed in accordance with Duke Energy's 10 CFR 50, Appendix B Quality Assurance (QA) Program and the ASME Section XI Code. In applying a deterministic approach to repair/replacement activities, a safety class (e.g., ASME Class 2 or 3) is assigned to every component within a system based on system function; the same treatment requirements are then applied to every component within the system without considering the risk associated with the probability that a specific item or component may or may not be functional at a time when needed.

Alternatively, a probabilistic approach to regulation enhances and extends the traditional deterministic approach by allowing consideration of a broader set of potential challenges to safety, providing a logical means for prioritizing these challenges based on safety significance, and allowing consideration of a broader set of resources to defend against these challenges. In contrast to the deterministic approach, Probabilistic Risk Assessment (PRA) addresses credible initiating events by assessing the event frequency. Mitigating system reliability is then assessed, including the potential for common cause failures. The probabilistic approach to regulation is an extension and enhancement of traditional regulation by considering risk in a comprehensive manner. In 2004, the NRC adopted a new Section 50.69 of 10 CFR relating to risk-informed categorization and treatment of

structures, systems, and components (SSCs) for nuclear power plants (Reference 8.6). This new section permits power reactor licensees to implement an alternative regulatory framework with respect to "special treatment" (treatment beyond normal industrial practices) of low safety significant (LSS) SSCs. In May 2006, the NRC staff issued Regulatory Guide (RG) 1.201, "Guidelines for Categorizing Structures, Systems, and Components in Nuclear Power Plants According to their Safety Significance, For Trial Use," Revision 1 (Reference 8.7). RG 1.201 endorses a categorization method, with conditions, for categorizing active SSCs described in Nuclear Energy Institute (NEI) 00-04, "10 CFR 50.69 SSC Categorization Guideline."

Duke Energy is not requesting NRC approval to implement 10 CFR 50.69 in this relief request. Instead, Duke Energy is proposing 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. Code Case N-752, which was approved by the ASME in July 2019, employs a comprehensive categorization process requiring input from both a PRA model and deterministic insights. This approach will enable 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.

5.0 PROPOSED ALTERNATIVE AND BASIS FOR USE:

Pursuant to 10 CFR 50.55a(z)(1), Duke Energy proposes to implement ASME Code Case N-752 as an alternative to the ASME Code requirements specified in Section 3. Code Case N-752 provides a process for determining the risk-informed categorization and treatment requirements for Class 2 and 3 pressure-retaining items or the associated supports as defined in Section 1. Code Case N-752 may be applied on a system basis or on individual items within selected systems. Code Case N-752 does not apply to Class 1 items.

The use of this proposed alternative is requested on the basis that requirements in Code Case N-752 will provide an acceptable level of quality and safety.

5.1. Overview of Code Case N-752

Code Case N-752 provides for risk-informed categorization and treatment requirements for performing repair/replacement activities on Class 2 and 3 pressure-retaining items or their associated supports. Code Case N-752 is not applicable to the following:

- Class CC and MC items.
- Piping within the break exclusion region [> NPS 4 (DN 100)] for high energy piping systems as defined by the Owner.
- That portion of the Class 2 feedwater system [> NPS 4 (DN 100)] of PWRs from the SG, including the SG, to the outer containment isolation valve.

Code Case N-752 categorization methodology relies on the conditional core damage and large early release probabilities associated with postulated ruptures. Safety significance is generally measured by the frequency and the consequence of the event. However, the risk-informed process categorizes components solely based on consequence, which measures the safety significance of the component given that it ruptures (component failure is assumed with a probability of 1.0). This approach is conservative compared to including the rupture frequency in the categorization as this approach will not allow the categorization of SSCs to be affected by any changes in frequency due to changes in treatment. It additionally applies deterministic considerations (e.g., defense in depth, safety margins) in determining safety significance. Additional detail is provided Section 5.2.

The risk-informed process categorizes components as either high safety-significant (HSS) or LSS. HSS components must continue to meet ASME Section XI rules for repair/replacement activities. LSS components are exempt from ASME Section XI repair/replacement requirements and can be repaired/replaced in accordance with treatment requirements established by the Owner. The treatment requirements must provide reasonable confidence that each LSS item remains capable of performing its safety-related functions under design basis conditions. Component supports, if categorized, are assigned the same safety significance, HSS or LSS, as the highest passively ranked segment within the bounds of the associated analytical pipe stress model. The categorization and treatment requirements of Code Case N-752 are consistent with those in 10 CFR 50.69.

It should be noted that Code Case N-752 is based on ANO-2 relief request ANO2-R&R-004, Revision 1, dated April 17, 2007 (Reference 8.8), as supplemented by Entergy. The NRC approved relief request ANO2-R&R-004, Revision 1, in a safety evaluation dated April 22, 2009 (Reference 8.9). The ANO-2 relief request was developed to serve as an industry pilot for implementing a risk-informed repair/replacement process that included a risk-informed categorization process and treatment requirements.

5.2. Basis for Use

The information below is provided as a basis or justification for Duke Energy's proposed alternative to implement the risk-informed categorization and treatment requirements of Code Case N-752 on Class 2 and 3 pressure-retaining items or the associated supports as defined in Section 1.

A. Application to Individual Items Within a System

The risk-informed methodology of Code Case N-752 may be applied on a system basis or on individual items within selected systems. Paragraph -1100 of Code Case N-752 states: “This Case may be applied on a system basis, including all pressure-retaining items and their associated supports, or on individual items categorized as low-safety-significant (LSS) within the selected systems.” While this is the case, the risk-informed methodology is, in actuality, applied to the pressure boundary function of the individual components within the system. The risk-informed methodology contained in Code Case N-752

requires that the component's pressure boundary function be assumed to fail with a probability of 1.0, and all impacts caused by the loss of the pressure boundary function be identified. This would include identifying impacts of the pressure boundary failure on the component under evaluation, identifying impacts of the pressure boundary failure of the component on the system in which the component resides, as well as identifying impacts of the pressure boundary failure of the component on any other plant SSC. This includes direct effects (e.g. loss of the flow path) of the component failure and indirect effects of the component failure (e.g. flooding, spray, pipe whip, loss of inventory). This comprehensive assessment of total plant impact caused by a postulated individual component failure is then used to determine the final consequence ranking. As such, the final consequence rank of the individual component would be the same regardless of whether the entire system or only the individual component is subject to the risk-informed methodology.

B. Categorization Process

The categorization process of Code Case N-752 is delineated in Appendix I of the Code Case. This categorization process is technically identical to the process approved by the NRC under Relief Request ANO2-R&R-004, Revision 1 (Reference 8.8), which, in turn, is based on founding principles in EPRI Report TR-112657, Revision B-A, "Revised Risk-Informed Inservice Inspection Evaluation Procedure," and the categorization process of Code Case N-660, but with improvements and lessons learned from trial applications.

The Code Case N-752 risk-informed categorization evaluation is performed by an Owner-defined team that includes experts with expertise in PRA, plant operations, system design, and safety or accident analysis. The risk-informed categorization process is based on the conditional consequence of failure, given that a postulated failure has occurred. A consequence category for each piping segment or component is determined via a failure modes and effects analysis (FMEA) and impact group assessment. The FMEA considers pressure boundary failure size, isolability of the break, indirect effects, initiating events, system impact or recovery, and system redundancy. The results of the FMEA for each system, or portion thereof, are partitioned into core damage impact groups based on postulated piping failures that cause an (1) initiating event, (2) disable a system/train/loop without causing an initiating event, or (3) cause an initiating event and disable a system/train/loop.

Failures are also evaluated for their importance relative to containment performance. In addition, the consequence rank is reviewed and adjusted to reflect the pressure boundary failure's impact on plant operation during shutdown and on the mitigation of external events. Credit may be taken for plant features and operator actions to the extent these would not be adversely affected by failure of the piping segment or component under consideration.

Consequence evaluation results are ranked as High, Medium, Low, or None (no change to base case). Piping segments/components ranked as High by the consequence evaluation process are considered HSS and require no further

review. Piping segments/components ranked as Medium, Low, or None by the consequence evaluation shall be determined to be HSS or LSS by evaluating the additional categorization considerations or conditions outlined in paragraph I3.4.2(b) of Code Case N-752. If any of these conditions are not met, then HSS shall be assigned. If all conditions are met, then LSS may be assigned. Finally, if LSS is assigned, the categorization process shall verify that there are sufficient margins to account for uncertainty in the engineering analysis and supporting data. If sufficient margin exists, then LSS should be assigned. If sufficient margin does not exist, then HSS shall be assigned.

C. PRA Technical Adequacy

The following demonstrates that the quality and level of detail of the processes used in categorization of SSCs are adequate. The PRA models described below have been peer reviewed and there are no PRA upgrades that have not been peer reviewed. The PRA models credited are the same PRA models credited in the License Amendment “Oconee Nuclear Station, Units 1, 2, And 3, Issuance of Amendments Regarding Adoption of Technical Specification Task Force (TSTF) -425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control -Risk-Informed Technical Specification Task Force (RITSTF) Initiative 5b," (Reference 8.10) and License Amendment "Oconee Nuclear Station, Units 1, 2, And 3, Issuance of Amendments Regarding Transition to a Risk-Informed, Performance-Based Fire Protection Program in Accordance with 10 CFR 50.48(c)," (Reference 8.11) with routine maintenance updates applied.

The ONS Code Case N-752 categorization process for the internal events and flooding hazard uses the plant-specific PRA model.

The Duke Energy risk management process ensures that the PRA model used in this application reflects the as-built and as-operated plant for each of the ONS units.

The PRA models described above have been assessed against RG 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," Revision 2.

The ONS internal events PRA model was subject to a self-assessment and a full-scope peer review conducted in May 2014 against RG 1.200 Revision 2. The internal events model was also subject to a focused scope peer review in October 2018 for an upgrade to the PRA. The ONS large early release frequency (LERF) PRA model was subject to a self-assessment and full-scope peer review conducted in December 2012.

The ONS internal flood PRA model was subject to a self-assessment and a full-scope peer review conducted in January 2013.

Findings were reviewed and closed in February 2019 for ONS Internal Events model using the process documented in Appendix X to NEI 05-04, "Close-out

of Facts and Observations" (F&Os) as accepted by NRC (Reference 8.12). After this review, the ONS Internal Events model has zero open findings.

Remaining findings and open items for LERF and Internal Flooding have been resolved and implemented in the model. Each of the open items have been dispositioned for Risk-Informed In-Service Inspection (RI-ISI) (Reference 8.13). All of the F&Os are shown to have no impact or negligible impact on RI-ISI. Application of Code Case N-752 utilizes a very similar analysis to RI-ISI and the PRA quality requirements/impacts for RI-ISI are sufficiently similar to use the same conclusions from RI-ISI for Code Case N-752.

The above information demonstrates that the PRA is of sufficient quality and level of detail to support the categorization process and has been subjected to a peer review process assessed against a standard or set of acceptance criteria that is endorsed by the NRC.

D. Feedback and Process Adjustment

Duke Energy shall review changes to the plant, operational practices, applicable plant, and industry operational experience, and, as appropriate, update the PRA and categorization and treatment processes. Duke Energy shall perform this review in a timely manner but no longer than once every two refueling outages. This approach is consistent with the feedback and adjustment process of 10 CFR 50.69(e).

E. Treatment Requirements for LSS Items

Code Case N-752 exempts LSS items, which have been categorized as LSS in accordance with the code case, from having to comply with the repair/replacement requirements of ASME Section XI. Exempted ASME Code requirements for LSS items are outlined in Section 3, above. In lieu of these requirements, Code Case N-752, Paragraph -1420 requires the Owner to define alternative treatment requirements which confirm with reasonable confidence that each LSS item remains capable of performing its safety-related functions under design basis conditions. These Owner treatment requirements must address or include all of the provisions stipulated in Paragraphs -1420(a) through (j) of the code case. This approach to treatment is consistent with RISC-3 treatment requirements specified in 10 CFR 50.69(d)(2).

To comply with the above, Duke Energy will develop new and/or revise existing procedures and documents to define treatment requirements for performing repair/replacement activities on LSS items in accordance with Code Case N-752. Duke Energy defined treatment requirements will address design control, procurement, installation, configuration control, and corrective action. Duke Energy procedures and documents will also include provisions which address/implement the following requirements:

1. Administrative controls for performing these repair/replacement activities.

2. The fracture toughness requirements of the original Construction Code and Owner's Requirements shall be met.

3. Changes in configuration, design, materials, fabrication, examination, and pressure-testing requirements used in the repair/replacement activity shall be evaluated, as applicable, to ensure the structural integrity and leak tightness of the system are sufficient to support the design bases functional requirements of the system.

4. Items used for repair/replacement activities shall meet the Owner's Requirements or revised Owner's Requirements as permitted by the licensing basis.

5. Items used for repair/replacement activities shall meet the Construction Code to which the original item was constructed. Alternatively, items used for repair/replacement activities shall meet the technical requirements of a nationally recognized code, standard, or specification applicable to that item as permitted by the licensing basis.

6. The repair methods of nationally recognized post-construction codes and standards (e.g., PCC-2, API-653) applicable to the item may be used.

7. Performance of repair/replacement activities, and associated non-destructive examination (NDE), shall be in accordance with the Owner's Requirements and, as applicable, the Construction Code, or post-construction code or standard, selected for the repair/replacement activity. Alternative examination methods may be used as approved by the Owner. NDE personnel may be qualified in accordance with IWA-2300 in lieu of the Construction Code.

8. Pressure testing of the repair/replacement activity shall be performed in accordance with the requirements of the Construction Code selected for the repair/replacement activity or shall be established by the Owner.

9. Baseline examination (e.g., preservice examination) of the items affected by the repair/replacement activity, if required, shall be performed in accordance with requirements of the applicable program(s) specifying periodic inspection of items. See paragraph 5.2.E.11, below, for additional details.

10. Implementation of Code Case N-752 does not negate or affect Duke Energy commitments to regulatory and enforcement authorities having jurisdiction at ONS Units 1, 2, and 3 and Keowee Hydro Station, Units 1 and 2.

11. Periodic ISI and inservice testing (IST) of LSS items at ONS Units 1, 2, and 3 and Keowee Hydro Station, Units 1 and 2 will continue to be performed as follows:

- ISI of LSS pressure-retaining items or their associated supports will be performed in accordance with Oconee's ISI program implemented in accordance with 10 CFR 50.55a.
- IST of pumps and valves that have been classified as LSS will be performed in accordance with Oconee's IST program implemented in accordance with 10 CFR 50.55a.
- IST of snubbers that have been classified as LSS will be performed in accordance with Oconee's Snubber Testing program implemented in accordance with 10 CFR 50.55a.
- Inspections of LSS items performed under other plant programs, such as the Flow Accelerated Corrosion will continue to be performed under those programs for ONS.

12. Conditions that would prevent an LSS item from performing its safety-related function(s) under design basis conditions will be corrected in a timely manner. For significant conditions adverse to quality, measures will be taken to provide reasonable confidence that the cause of the condition is determined, and corrective action taken to preclude repetition. Corrective action of adverse conditions associated with LSS items will be identified and addressed in accordance with Duke Energy's existing corrective action program. Finally, this approach to corrective action of LSS items is consistent with the NRC position on corrective action of Risk-Informed Safety Class (RISC)-3 SSCs as specified in 10 CFR 50.69(d)(2)(ii).

13. As permitted by Code Case N-752, Duke Energy intends to implement the exemption on IWA-1400(f) and IWA-4000 applicable to utilization of an AIA and Authorized Nuclear Inservice Inspector (ANII) when performing repair/replacement activities on LSS items. In lieu of ANII inspection services, Duke Energy believes that its proposed treatment requirements, as described herein, provide reasonable confidence that LSS systems and items remain capable of performing their safety-related functions when repair/replacement activities are performed without the inspection services of an ANII. It should also be noted that the exemption of ANII services is not unique to Code Case N-752. Utilization of ANII inspection services is already exempt by ASME Section XI for certain items and activities such as small items (IWA-4131) and rotation of items for testing or preventative maintenance (IWA-4132). Finally, exemption of ANII services for this code case application is consistent with the NRC's position on risk-informed programs as specified in 10 CFR 50.69(b)(1)(v).

14. As permitted by Code Case N-752, Duke Energy intends to implement the QA Program exemption applicable to IWA-1400(n) and IWA-4000 when performing repair/replacement activities on LSS items. That said, this code case exemption only applies if compliance with 10 CFR 50, Appendix B, or NQA-1 is not required by the NRC at the Owner's facility. To address this issue, Duke Energy will update the Fleet Quality Assurance Program Description (QAPD) for safety-related Class 2 and 3

SSCs identified as LSS in accordance with ASME Code Case N-752 to not be required to meet the requirements of the QAPD. Duke Energy will develop elements describing treatment of these LSS SSCs to ensure continued capability and reliability of the design basis function. In accordance with 10 CFR 50.54(a)(3)(ii), Duke Energy is not requesting prior NRC approval of the change to the QAPD because it has previously been approved for Entergy (Reference 8.14) in conjunction with a request for Arkansas Nuclear One to adopt ASME Code Case N-752 (References 8.15 and 8.16).

15. As permitted by Code Case N-752, Duke Energy intends to implement the exemptions on IWA-1400(j) and IWA-4000 applicable to repair/replacement programs and plans. In lieu of these ASME Section XI administrative controls, Duke Energy will establish Owner-defined administrative controls as required by paragraph -1420(a) of Code Case N-752. Duke Energy will utilize its existing work management processes for planning and documenting the performance of repair/replacement activities and supplement those process requirements as necessary to comply with Code Case N-752. These controls will ensure that repair/replacement activities on LSS items are performed in accordance with work instructions that have been appropriately, planned, reviewed, and implemented. It should also be noted that the exemption of Repair/Replacement Plans as required by IWA-1400(j) and IWA-4150 is not unique to Code Case N-752. Repair/Replacement Plans are already exempt by ASME Section XI for certain items and activities such as small items (IWA-4131) and rotation of items for testing or preventative maintenance (IWA-4132). Finally, the exemption of ASME Section XI programs and plans and the alternative use of Owner-defined administrative requirements on LSS items is consistent with the NRC’s position on risk-informed programs as specified in 10 CFR 50.69(b)(1)(v).

16. As permitted by Code Case N-752, Duke Energy intends to implement the exemption on IWA-4000 applicable to repair/replacement activities. Article IWA-4000 of the ASME Section XI Code specifies administrative, technical, and programmatic requirements for performing repair/replacement activities on pressure-retaining items and their supports. As specified in IWA-4110(b), repair/replacement activities "include welding, brazing, defect removal, metal removal by thermal means, rerating, and removing, adding, and modifying items or systems. These requirements are applicable to procurement, design, fabrication, installation, examination, and pressure testing of items within the scope of this Division". In lieu of these IWA-4000 requirements, Duke Energy will perform repair/replacement activities on LSS items in accordance with an Owner-defined program that complies with paragraph -1420 of Code Case N-752. The Duke Energy program will utilize existing Duke Energy processes such as those applicable to procurement, design, re-rating, fabrication, installation, modifications, welding, defect removal, metal removal by thermal processes and supplement those process requirements as necessary to comply with Code Case N-752. Duke

Energy believes this program will ensure, with reasonable confidence, that LSS items remain capable of performing their safety-related functions under design basis conditions. Finally, the exemption of IWA-4000 requirements and the alternative use of Owner-defined treatment requirements for LSS items is consistent with the NRC's position on risk-informed programs as specified in 10 CFR 50.69(b)(1)(v) and (d)(2).

17. As permitted by Code Case N-752, Duke Energy intends to implement the documentation exemptions on IWA-6210(d), IWA-6210(e), and IWA-6350. These ASME Section XI paragraphs address preparation and retention of various ASME Section XI records such as Form NIS-2, IWA-4160 verification of acceptability evaluations, IWA-4311 evaluations, Repair/Replacement Plans, and reconciliation documentation. In lieu of these ASME Section XI forms and evaluations, the following repair/replacement activity records shall be retained in accordance with Duke Energy's Owner-defined program for performing repair/replacement activities on LSS items.

    - Repair/replacement activity documentation.
    - Evaluations of LSS items that do not comply with requirements of the applicable Construction Code, standard, specification, and/or design specification. See also paragraph 5.2.E.12.
    - Evaluations and documentation of design and configuration changes including material changes.

In addition to the above, Duke Energy will also revise applicable ONS Units 1, 2, and 3 and Keowee Hydro Station, Units 1 and 2 licensing basis documents (e.g., Safety Analysis Report), as appropriate, to identify systems, subsystems, or individual items that have been categorized as LSS and address alternative treatment requirements. Changes to licensing basis documents will be performed in accordance with 10 CFR 50.59.

F. Conclusion

Code Case N-752 specifies requirements for performing risk-informed categorization and treatment for performing repair/replacement activities on Class 2 and 3 pressure-retaining items or associated supports. The Code Case N-752 categorization process provides a comprehensive methodology for determining the safety significance of items – HSS or LSS. This categorization process is technically identical to that approved by the NRC under relief request ANO2-R&R-004, Revision 1 (Reference 8.8). Repair/replacement activities performed on items determined to be HSS must continue to comply with the ASME Section XI Code. Repair/replacement activities performed on LSS items may comply with alternative treatment requirements that are defined by the Owner but must comply with all provisions of paragraph -1420 of Code Case N-752. Duke Energy's proposed treatment requirements, as described herein, meet these criteria, and provide reasonable confidence that LSS systems and items remains capable of performing their safety-related functions under design basis conditions. Finally, categorization

and treatment requirements of Code Case N-752 applicable to repair/replacement activities are consistent with NRC requirements specified in 10 CFR 50.69.

6.0 DURATION OF PROPOSED ALTERNATIVE

The duration of this relief request is for the remainder of the current renewed operating licenses for Oconee Units 1, 2, and 3, as shown below. Applicability for Keowee Hydro Station Units 1 and 2 is associated with the renewed operating license of Oconee Unit 3.

	Docket Number	License Expires
Unit 1	05000269	02/06/2033
Unit 2	05000270	10/06/2033
Unit 3	05000287	07/19/2034

7.0 PRECEDENT

7.1. Entergy Operations, Inc., Arkansas Nuclear One Units 1 and 2 Request for Relief No. EN-20-RR-001, submitted May 27, 2020 (ML20148M343), approved May 19, 2021 (ML21118B039).

7.2. Several domestic nuclear power plants have sought and obtained approval to apply the risk-informed evaluation and categorization (classification) process of Relief Request ANO2-R&R-004, Revision 1, for repair/replacement activities for Class 2 and Class 3 pressure-retaining items or their associated supports. These include the following Duke Energy Sites:

7.2.1. NRC Letter, “Brunswick Steam Electric Plant, Units 1 and 2 – Issuance of Amendment Nos. 305 and 333 to revise License Conditions to Modify Approved 10 CFR 50.69, “Risk-Informed Categorization and Treatment of Structures, Systems, and Components for Nuclear Power Reactors” Categorization Process”, dated April 30, 2021 (ML21067A224).

7.2.2. NRC letter to Duke Energy, “H.B. Robinson Steam Electric Plant, Unit No. 2 – Issuance of Amendment No. 266 to Adopt 10 CFR 50.69, “Risk-Informed Categorization and Treatment of Structures, Systems, and Components for Nuclear Power Reactors,” dated September 24, 2019 (ML19205A289).

7.2.3. NRC letter to Duke Energy, “Shearon Harris Nuclear Power Plant, Unit 1 – Issuance of Amendment No. 174 RE: Adopt Title 10 of the Code of Federal Regulations 50.69, “Risk-Informed Categorization and Treatment of Structures, Systems, and Components (SSCs) for Nuclear Power Reactors,” dated September 17, 2019 (ML19192A012).

8.0 REFERENCES

8.1. American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Section XI, 2007 Edition with the 2008 Addenda.

8.2. RIS 2004-12, Clarification on use of Later Editions and Addenda to the ASME OM Code and Section XI (ML042090436).

8.3. Safety Evaluation by the Office of Nuclear Reactor Regulation “Request to Use a Provision of a Later Edition of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI,” dated November 9, 2020 (ML20300A206).

8.4. RIS 2004-16, Use of Later Editions and Addenda to ASME Code Section XI for Repair/Replacement Activities (ML042590067).

8.5. Safety Evaluation by the Office of Nuclear Reactor Regulation “Request for Use of a Later Edition of ASME Boiler and Pressure Vessel Code, Section XI for Repair and Replacement Activities,” dated May 6, 2021 (ML21113A013).

8.6. 10 CFR 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems, And Components for Nuclear Power Reactors," USNRC, 69 FR 68047, Nov. 22, 2004.

8.7. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.201, Revision 1, "Guidelines for Categorizing Structures, Systems, And Components in Nuclear Power Plants According to Their Safety Significance," dated May 2006.

8.8. Entergy Letter to NRC dated April 17, 2007, "Request for Alternative ANO2-R&R-004, Revision 1, Request to Use Risk-Informed Safety Classification and Treatment for Repair/Replacement Activities in Class 2 and 3 Moderate Energy Systems," (ML071150108) as supplemented by letters dated August 6, 2007 (ML072220160), February 20, 2008 (ML080520186), and January 12, 2009 (ML090120620).

8.9. Safety Evaluation Report (SER) by the Office of Nuclear Reactor Regulation "Approval of Request for Alternative ANO2-R&R-004, Revision 1, Request to Use Risk-Informed Safety Classification and Treatment for Repair/Replacement Activities in Class 2 and 3 Moderate and High Energy Systems," dated April 22, 2009 (ML090930246).

8.10. License Amendment, Oconee Nuclear Station, Units 1, 2, And 3, Issuance of Amendments Regarding Adoption of Technical Specification Task Force (TSTF) - 425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control -Risk-Informed Technical Specification Task Force (RITSTF) Initiative 5b," dated March 21, 2011 (ML110470446).

8.11. License Amendment, "Oconee Nuclear Station, Units 1, 2, And 3, Issuance of Amendments Regarding Transition to a Risk-Informed, Performance-Based Fire Protection Program in Accordance with 10 CFR 50.48(c)," dated December 29, 2010, (ML103630612).

8.12. NRC Letter to NEI, "U.S. Nuclear Regulatory Commission Acceptance on Nuclear Energy Institute Appendix X to Guidance 05-04, 07-12, and 12-13, Close-Out of Facts and Observations (F&Os)," dated May 3, 2017 (ML17079A427).

8.13. OSC-11584, Rev 4 "ONS PRA Acceptability and Internal Flooding Scenario Categorization for RI-ISI".

8.14. NRC Letter to Entergy, "Arkansas Nuclear One, Units 1 and 2 - Request for Approval of Change to the Entergy Quality Assurance Program Manual," dated May 19, 2021 (ML21132A279).

8.15. Entergy letter to NRC, "Relief Request Number EN-20-RR-001 – 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," dated May 27, 2020 (ML20148M343).

8.16. NRC Letter to Entergy, "Arkansas Nuclear One, Units 1 and 2 – Approval of Request for Alternative from Certain Requirements of The American Society of Mechanical Engineers Boiler and Pressure Vessel Code," dated May 19, 2021 (ML21118B039).

8.17. Duke Energy Letter to NRC, "Request to Use a Provision of a Later Edition of the ASME Boiler and Pressure Vessel Code, Section XI," dated September 16, 2020 (ML20260H325).