Attachment - Exemption

NUCLEAR REGULATORY COMMISSION

Docket No. 50-269, 50-270, 50-287

Duke Energy Carolinas, LLC

Oconee Nuclear Station, Units No. 1, 2 and 3

Exemption

I. Background.

Duke Energy Carolinas, LLC (Duke Energy, the licensee) is the holder of the Subsequent Renewed Facility Operating Licenses (SRFOLs) Nos DPR-38, DPR-47, and DPR-55 for Oconee Nuclear Station, Units 1, 2, and 3 (Oconee Units 1, 2 and 3), which consist of three Pressurized Water Reactors (PWRs) located in Seneca, South Carolina. The SRFOLs provide, among other things, that the facilities are subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC, the Commission) now or hereafter in effect.

On July 17, 2024, NRC issued a final rule incorporating by reference Regulatory Guide (RG) 1.147, Revision 21 (Agencywide Documents Access and Management System (ADAMS), Accession Nos. ML23291A003), in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(3)(ii) (89 FR 58039). This RG determined American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI (ASME BPV XI) Code Case N-921, “Alternative 12-yr Inspection Interval Duration, Section XI, Division1,” to be conditionally acceptable. This code case allows NRC licensees to implement an inservice inspection (ISI) program based upon a 12-year ISI interval, as opposed to the traditional 10-year ISI interval required by ASME BPV XI, Article IWA-2431. RG 1.147, Revision 21, specifies four conditions on Code Case N-921. Condition 2 states, “This code case can only be implemented at the beginning of an ISI

interval as part of a routine update of the ISI program." The July 17, 2024, final rule also added 10 CFR 50.55a(y), which includes a definition for the term "inservice inspection interval." This definition, in part, specifies that the length of the ISI interval is described in ASME BPV XI, Article IWA-2431.

II. Request/Action.

By application dated May 8, 2025 (ML25128A041), as supplemented by letter dated August 21, 2025, (ML25233A035), the licensee, pursuant to 10 CFR 50.12, "Specific exemptions," requested an exemption from certain requirements of 10 CFR 50.55a(a)(3)(ii) and 10 CFR 50.55a(y) to allow the use of Code Case N-921 after the start dates of the sixth ISI and fourth CISI intervals at Oconee Units 1, 2 and 3, which is not in accordance with Condition 2 on Code Case N-921, as specified in RG 1.147, Revision 21. The sixth ISI and fourth CISI intervals at Oconee Units 1, 2 and 3, began on July 15, 2024. The licensee stated that the proposed exemption does not impact the Inservice Testing (IST) program or snubber program, which are implemented under the requirements of the ASME Operation and Maintenance Code.

III. Discussion.

Pursuant to 10 CFR 50.12(a), the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50 when (1) the exemptions are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security and (2) special circumstances are present. Under 10 CFR 50.12(a)(2), special circumstances are present when at least one of the following six conditions are met:

(i) Application of the regulation in the particular circumstances conflicts with other rules or requirements of the Commission; or

(ii) Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule; or

(iii) Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated; or

(iv) The exemption would result in benefit to the public health and safety that compensates for any decrease in safety that may result from the grant of the exemption; or

(v) The exemption would provide only temporary relief from the applicable regulation and the licensee or applicant has made good faith efforts to comply with the regulation; or

(vi) There is present any other material circumstance not considered when the regulation was adopted for which it would be in the public interest to grant an exemption.

A. The Exemption is Authorized by Law

The exemption would authorize exemption from certain requirements of 10 CFR 50.55a(a)(3)(ii) and 10 CFR 50.55a(y) to allow the use of Code Case N-921, after the start dates of the sixth ISI and fourth CISI intervals at Oconee Units 1, 2 and 3. As stated, 10 CFR 50.12(a) allows the NRC to grant an exemption from the requirements of 10 CFR Part 50, including 10 CFR 50.55a(a)(3)(ii) and 10 CFR 50.55a(y), when the exemption is authorized by law. An exemption is authorized by law where it is not expressly prohibited by statute or regulation. A proposed exemption is implicitly authorized by law if it will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special

circumstances are present, and no other provisions in law prohibit, or otherwise restrict, its application. The NRC staff has determined that no provisions in law expressly prohibit or otherwise restrict the application of the requested exemption. The NRC staff has also determined, as explained below, that the requested exemption will not present an undue risk to the public health and safety, is consistent with the common defense and security, and special circumstances are present. Therefore, the NRC staff concludes that the exemption is authorized by law.

B. The Exemption Presents no Undue Risk to Public Health and Safety

This exemption would allow the licensee to implement Code Case N-921 after the start dates of the sixth ISI and fourth CISI intervals at Oconee Units 1, 2 and 3. The action does not change the manner in which the plant operates and maintains public health and safety because the exemption does not result in a change to the facility or the current operating license. The licensee stated that extending the ISI interval by two years does not impact the technical basis supporting any of the currently authorized 10 CFR 50.55a alternatives and does not create any particular challenge in reconciling the ISI inspection schedules to conform with the three four-year periods specified in Code Case N-921. Accordingly, the NRC staff reviewed the alternatives listed in Attachment 3 of the licensee's exemption request for ISI interval-related impacts and identified several common themes in these alternatives and evaluated the alternatives as described below.

Alternatives with No ISI Interval Relationship

Several of the authorized alternatives in Attachment 3 of the licensee's exemption request are unrelated to the length of the ISI interval. The NRC staff's assessment of each of these authorized alternatives is documented below.

The NRC staff noted that the authorized alternatives identified by 15-ON-001 and

RA-20-0036 are related to repair techniques by installation of replacement pressure-retaining parts that fully encapsulate the degraded piping. The NRC staff confirmed that the authorized alternatives granted by letters dated December 29, 2015 (ML15349A453) and July 30, 2020 (ML20206K928) for 15-ON-001 and RA-20-0036, respectively, are unrelated to the length of the ISI interval and are only associated with repair and mitigation techniques for subject components. Therefore, the NRC staff's basis for approving this alternative is not impacted by extending the length of the ISI interval to 12 years.

The NRC staff noted that the authorized alternative identified by RA-22-0174 is related to the use Code Case N-752, which provides a process for determining the risk-informed categorization and treatment requirements for Class 2 and 3 pressure-retaining items or the associated supports. The NRC staff confirmed that this authorized alternative granted by letter dated December 13, 2023 (ML23262A967), is unrelated to the length of the ISI interval and is only associated with the risk-informed categorization and treatment for repair and replacement activities in Class 2 and 3 systems in lieu of current regulatory requirements for codes and standards. Therefore, the NRC staff's basis for approving this alternative is not impacted by extending the length of the ISI interval to 12 years.

The NRC staff noted that the authorized alternative identified by RA-23-0018 is related to the use Code Case N-853 (with two deviations), which provides an alternative to the defect removal requirements of Section XI of the ASME Code to repair or proactively mitigate the Alloy 600 nozzle welds. The NRC staff confirmed that this authorized alternative granted by letter dated October 20, 2023 (ML23285A074), is unrelated to the length of the ISI interval and is only associated with techniques to preemptively mitigate or repair the subject components to address Primary Water Stress

Corrosion Cracking susceptibility. Therefore, the NRC staff's basis for approving this alternative is not impacted by extending the length of the ISI interval to 12 years.

The NRC staff noted that the authorized alternative identified by RA-19-0418 is related to the modification in scope and schedule for required examinations required by IWL, "Requirements for Class CC Concrete Components of Light-Water Cooled Power Plants" of Section XI of ASME Code. By letter dated August 21, 2025, (ML25233A035), the licensee confirmed it will maintain the ASME Section XI, Subsection IWL-2400 inspection schedules after adopting the 12-year ISI interval per Code Case N-921. The staff noted that the ASME Section XI, Subsection IWL-2400 inspection schedules are independent interval dates, since the timing of these inspections are based on the date of the structural integrity test. Thus, the NRC staff confirmed that this authorized alternative granted by letter dated December 7, 2021 (ML21335A106), is unrelated to the length of the ISI interval and is only associated with deferring certain required examinations by five years. Therefore, the NRC staff's basis for approving this alternative is not impacted by extending the length of the ISI interval to 12 years.

Alternatives Based on Technical Reports with 10-Year ISI Intervals

The NRC staff noted that the authorized alternatives identified by RA-22-0256 and RA-22-0257 are based on technical reports, as identified below, which were originally developed based on the assumption of 10-year ISI intervals:

- EPRI Technical Report 3002015906, "Technical Bases for Inspection Requirements for PWR Steam Generator Class 1 Nozzle-to-Vessel Welds and Class 1 and Class 2 Vessel Head, Shell, Tubesheet-to-Head, and Tubesheet-to-Shell Welds," 2019 (ML20225A141).
- EPRI Technical Report 3002014590, "Technical Bases for Inspection Requirements for PWR Steam Generator Feedwater and Main Steam

Nozzle-to-Shell Welds and Nozzle Inside Radius Sections," 2019 (ML19347B107).

- EPRI Technical Report 3002015905, "Technical Bases for Inspection Requirements for PWR Pressurizer Head, Shell-to-Head, and Nozzle-to-Vessel Welds," 2019 (ML21021A271).

These assessments include flaw tolerance evaluations using probabilistic fracture mechanics and deterministic fracture mechanics, and a survey of inspection results from 74 domestic and international nuclear units. Based on the conclusions of the three reports, the licensee requested an alternative to the ASME Code, Section XI, examination requirements for the subject steam generator and pressurizer welds in RA-22-0256 and RA-22-0257, respectively.

While the analyses in these technical reports were developed based on the assumption of 10-year ISI intervals in calculating failure probability, the NRC staff noted that there are offsetting factors that account for potential impacts of a 12-year ISI interval. First, these technical reports and the licensee's submittal for the authorized alternatives (see ML23256A088 and ML23264A853) contain generic and plant-specific sensitivity studies that considered a pre-service inspection followed by various scenarios for subsequent inservice inspections as well as a plant-specific limiting scenario, which was not specifically considered in these EPRI technical reports. The NRC staff finds that these sensitivity studies bound the impacts of a 12-year ISI interval, where the examinations may be more spread out in time but not eliminated. In addition, the analyses in these technical reports assume the existence of flaws in the subject welds. This is a conservative assumption, since the examination history of these locations does not indicate that significant cracking is occurring. Additionally, specific inspections to be completed by the licensee at pre-determined years as part of its performance monitoring

plan are outlined in the respective approval letters for RA-22-0256 and RA-22-0257. The NRC staff noted that these scheduled inspections at the Duke Energy fleet addressed within RA-22-0256 and RA-22-0257 ensure that no more than 20 years elapses between the performance of an ASME Code, Section XI, examination for the respective weld/component and is scheduled to occur regardless of the length of the ISI interval. Therefore, the NRC staff's basis for this performance monitoring plan in those alternatives is not impacted by extending the length of the ISI interval to 12 years. Finally, the licensee stated that alternatives RA-22-0256 and RA-22-0257, which addressed the steam generator welds and pressurizer welds, respectively, are authorized only through the end of the current license. Therefore, the licensee must reassess this examination requirement at the end of the license, regardless of the length of the ISI interval.

Accounting for these factors, as discussed above, the NRC staff finds that the NRC staff's basis for approving the alternatives in RA-22-0256 and RA-22-0257 is not impacted by extending the length of the ISI interval to 12 years.

Furthermore, the NRC staff noted that the authorized alternative identified by RA-20-0328 is based on an NRC-approved topical report, as identified below, which was originally developed based on the assumption of 10-year ISI intervals:

- WCAP-16168-NP-A, Revision 3, "Risk-Informed Extension of the Reactor Vessel In-Service Inspection Interval," 2011 (ML11306A084).

WCAP-16168-NP-A provides the technical and regulatory basis for decreasing the frequency of inspections by extending the ASME Code, Section XI, inservice inspection (ISI) interval from 10 years to 20 years for ASME Code, Section XI, Category B-A and B-D reactor vessel (RV) welds in pressurized water reactors.

While the methodology and analyses in this topical report were developed based,

in part, on the assumption of 10-year ISI intervals in calculating failure probability, the NRC staff noted that there are offsetting factors that account for potential impacts of a 12-year ISI interval. First, Section 3, “Pilot Plant Summary,” and Section 4, “Risk Assessment,” in WCAP-16168-NP-A includes data and results from a sensitivity study and quantitative risk assessment that provide the technical basis for extending the ASME Section XI Inspection interval from 10 years to 20 years for Category B-A and B-D RV nozzle welds, which bounds the impacts of performing ISI inspections under a 12-year ISI interval. Second, WCAP-16168-NP-A also assumes the existence of embedded flaws in welds, plates (includes forgings), and inner surface breaking flaws in the subject components. The NRC staff finds this to be a conservative assumption, because the examination history of these locations does not indicate that significant cracking is occurring. Additionally, inspections by the licensee at Oconee Units 1, 2 and 3, for the applicable RPV weld and nozzle components in the years 2032, 2033, and 2034 refueling outage for each unit, respectively, are pre-determined as part of its performance monitoring plan outlined in the approval letter for RA-20-0328. The NRC staff noted that these scheduled inspections at Oconee Units 1, 2 and 3, addressed within RA-20-0328 are scheduled to occur regardless of the length of the ISI interval. Therefore, the NRC staff’s basis for this performance monitoring plan in the alternative is not impacted by extending the length of the ISI interval to 12 years since the alternative requires deferred 5th Interval reactor vessel exams for Oconee Units 1, 2 and 3 to be completed in the 6th Interval no later than 2032, 2033, and 2034, respectively.

Accounting for these factors, as discussed above, the NRC staff concludes that the NRC staff’s basis for approving the alternative in RA-20-0328 is not impacted by extending the length of the ISI interval to 12 years.

Based on its review of the licensee’s analysis of alternatives in Attachment 3 of

the exemption request, the NRC staff concludes that the exemption would not result in any significant reduction in the effectiveness of the ISI and CISI programs implemented by the licensee at Oconee Units 1, 2 and 3. Further, based on the above, the NRC staff concludes that the exemption would not present an undue risk to the public health and safety.

C. The Exemption is Consistent with the Common Defense and Security

The requested exemption would allow the licensee to implement Code Case N-921 after the start dates of the sixth ISI and fourth CISI intervals at Oconee Units 1, 2 and 3. The change is administrative in nature, adequately controlled by the ISI Programs criteria and ASME Code requirements and is not related to security issues. The length of these intervals is also not related to security issues. Thus, NRC staff determined that the common defense and security is not impacted by this exemption, and, therefore, the exemption is consistent with the common defense and security.

D. Special Circumstances

The regulation under 10 CFR 50.12(a)(2) states, in part, that "[t]he Commission will not consider granting an exemption unless special circumstances are present," and describes, in 10 CFR 50.12(a)(2)(i) – (vi), the conditions under which special circumstances exist. In the licensee's exemption request submittal Section III, "Basis for Approval of Exemption Request," item (d), the licensee stated that three of the six special circumstances listed in 10 CFR 50.12(a)(2) are present:

(ii) Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule.

(iii) Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are

significantly in excess of those incurred by others similarly situated.

(vi) There is present any other material circumstance not considered when the regulation was adopted for which it would be in the public interest to grant an exemption.

The NRC staff performed an independent review of the special circumstances claimed by the licensee.

For the special circumstances in 10 CFR 50.12(a)(2)(ii), the licensee stated that the purpose of the July 2024 final rule (89 FR 58039) was to identify ASME Code cases that the NRC determined to be acceptable for use. The licensee noted that NRC's approval of Code Case N-921 includes a condition that, "This code case can only be implemented at the beginning of an ISI interval as part of a routine update of the ISI program." The licensee provided the following support to the claim that application of the regulation would not serve the underlying purpose of the rule:

- The licensee stated that the exemption would not inhibit the ability of the licensee to comply with the ASME BPV XI examination distribution requirements.
- Table 4 through 6 for Oconee Units 1, 2 and 3, of the licensee's submittal described the new inspection period dates and corresponding refueling outages.
- The licensee evaluated all NRC-authorized alternative requests in Attachment 3 of the licensee's submittal, consistent with NRC concerns expressed in the 89 FR 58039 final rule preamble (see NRC staff's independent review in Section III.B above).
- The licensee stated that the site ISI program owners routinely modify the ISI examination schedule during the ISI interval due to various reasons, such as evolving availability of qualified personnel and equipment.

In the 89 FR 58039 final rule preamble, the NRC communicated that order and

predictability of licensee ISI programs is a paramount consideration. The careful advance planning required by ASME BPV XI and 10 CFR 50.55a maximizes licensee effectiveness in successfully executing all ISI requirements. The successful execution of ISI requirements, in turn, contributes to nuclear safety by providing a data stream used to continuously evaluate the structural integrity of safety-related components. The NRC staff determined that the licensee provided adequate evidence that, if the NRC staff approves the proposed exemption, the CISI and ISI programs at Oconee Units 1, 2 and 3, will be managed in a manner that promotes order and predictability.

In the 89 FR 58039 final rule, the NRC added a new condition requiring that Code Case N-921 be implemented at the start of a new ISI interval. The basis for the condition is that implementation of Code Case N-921 in the middle of an ISI interval creates complications related to existing examination schedules and alternatives that were approved assuming a 10-year ISI interval. As discussed above, the licensee demonstrated that no currently approved alternatives are impacted by extending the length of the ISI interval to 12 years. Another concern identified by the NRC staff with allowing mid-cycle implementation of Code Case N-921 involves potential complications of reconciling ISI inspection schedules to conform with the three 4-year periods specified in Code Case N-921. As discussed above, the licensee stated that in anticipation of implementing Code Case N-921, it proactively adjusted examination schedules accordingly to maintain compliance with Code Case N-921 periodic distribution requirements. Therefore, the NRC staff concludes that application of the regulation would not serve the underlying purpose of the rule because the licensee demonstrated that mid-cycle implementation of Code Case N-921 will have no impact on the CISI and ISI programs at Oconee Units 1, 2 and 3. Based on the above, the NRC staff determined that the special circumstances described in 10 CFR 50.12(a)(2)(ii) are present for the

requested exemption. Since the regulations require that one of the special circumstances in 10 CFR 50.12(a)(2) be satisfied before the NRC may grant an exemption, the NRC staff did not evaluate the licensee's additional claims that the special circumstances in 10 CFR 50.12(a)(2)(iii) and (vi) are also applicable.

E. Environmental Considerations

The NRC staff determined that the exemption discussed herein meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(25) because (i) there is no significant hazards consideration; (ii) there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite; (iii) there is no significant increase in individual or cumulative public or occupational radiation exposure; (iv) there is no significant construction impact; (v) there is no significant increase in the potential for or consequences from radiological accidents; and (vi) the requirements from which an exemption is sought are among those identified in 10 CFR 51.22(c)(25)(vi), including requirements of an administrative, managerial, or organizational nature. Therefore, in accordance with 10 CFR 51.22(b), no environmental impact statement or environmental assessment need to be prepared in connection with the issuance of the exemption. The basis for this NRC staff determination is discussed as follows with an evaluation against each of the requirements in 10 CFR 51.22(c)(25).

Requirements in 10 CFR 51.22(c)(25)(i) – There is no significant hazards consideration.

The criteria for determining whether an action involves a significant hazards consideration are found in 10 CFR 50.92(c). The exemption only involves a CISI and ISI program implementation change, which is administrative in nature. The exemption does not adversely affect plant equipment, operation, or procedures. Therefore, there are no significant hazard considerations, because granting the exemption would not: (1) involve a significant increase in the probability or consequences of an accident previously

evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

Requirements in 10 CFR 51.22(c)(25)(ii) – There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

The exemption involves only a CISI and ISI program implementation change, which is administrative in nature, and does not involve any changes in the types or significant increase in the amounts of any effluents that may be released offsite.

Requirements in 10 CFR 51.22(c)(25)(iii) – There is no significant increase in individual or cumulative public or occupational radiation exposure.

Since the exemption involves only a CISI and ISI program implementation change, which is administrative in nature, it does not contribute to any significant increase in occupational or public radiation exposure.

Requirements in 10 CFR 51.22(c)(25)(iv) – There is no significant construction impact.

Since the exemption involves only a CISI and ISI program implementation change, which is administrative in nature, it does not involve any construction impact.

Requirements in 10 CFR 51.22(c)(25)(v) – There is no significant increase in the potential for or consequences from radiological accidents.

The exemption involves only a CISI and ISI program implementation change, which is administrative in nature and does not impact the potential for or consequences from accidents.

Requirements in 10 CFR 51.22(c)(25)(vi)(I) – The requirements from which the exemption is sought involve requirements that of an administrative, managerial, or organizational nature.

The exemption involves only a CISI and ISI program implementation change regarding examination scheduling requirements and other requirements of an

administrative, managerial, or organizational nature, because it is associated with the marginal extension from a 10-year to 12-year ISI interval.

Based on the above, NRC staff determined that the exemption meets the eligibility criteria for the categorical exclusion set forth in 10 CFR 51.22(c)(25). Therefore, in accordance with 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with these exemption requests.

IV. Conclusions.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Also, special circumstances are present. Therefore, the Commission hereby grants Duke Energy Carolinas, LLC's request for exemption from certain requirements of 10 CFR 50.55a(a)(3)(ii) and 10 CFR 50.55a(y) to allow the implementation of ASME Code Case N-921 after the start dates of the sixth ISI and fourth CISI intervals at Oconee Units 1, 2 and 3.

This exemption is effective upon issuance.

Dated: December 23, 2025.

For the Nuclear Regulatory Commission.

AIDA RIVERA-VARONA

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