



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM

REQUEST FOR RELIEF NO. 99-01

DUKE ENERGY CORPORATION

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

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

1.0 INTRODUCTION

The inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) states in part that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2 and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable ASME Section XI Code for the Oconee Units 1, 2, and 3 third ten-year inservice inspection (ISI) interval is the 1989 Edition. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving

due consideration to the burden upon the licensee that could result if the requirements were imposed.

By letter dated May 26, 1999, Duke Energy Corporation, the licensee for the Oconee Nuclear Station, Units 1, 2, and 3, submitted to the NRC a request for relief from the Code-required volumetric examination coverage of the steam generator outlet nozzle-to-vessel welds and the outlet nozzle inside radius sections for the third 10-year inspection interval. For each of the outlet nozzle-to-vessel welds and the inside radius sections, the ultrasonic scan from the nozzle outside surface resulted in volumetric coverages of 40 percent and 44 percent respectively due to component geometry and the interference of the support skirt as opposed to the Code-required volumetric coverage over 90 percent. The licensee has determined that the Code-required volumetric examination of the subject welds and the inside radius sections is impractical. The staff has reviewed and evaluated the licensee's request for relief and the supporting information, pursuant to 10 CFR 50.55a(g)(6)(i).

Discussion

System/Component for which Relief is Requested

Part 1 Steam Generator Outlet Nozzle-to-Vessel Welds;

<u>Unit</u>	<u>ID Number</u>	<u>Item Number</u>
1	1-SGB-WG50-2	B03.130.003
1	1-SGB-WG50-1	B03.130.004
2	2-SGB-WG50-2	B03.130.001
2	2-SGB-WG50-1	B03.130.002
3	3-SGB-WG50-2	B03.130.003
3	3-SGB-WG50-1	B03.130.004

Part 2 Steam Generator Outlet Nozzle Inside Radius Sections;

<u>Unit</u>	<u>ID Number</u>	<u>Item Number</u>
1	1-SGB-WG50-2	B03.130.003
1	1-SGB-WG50-1	B03.130.004
2	2-SGB-WG50-2	B03.130.001
2	2-SGB-WG50-1	B03.130.002
3	3-SGB-WG50-2	B03.130.003
3	3-SGB-WG50-1	B03.130.004

For welds listed in this request for relief (both Parts 1 and 2), all configurations, including interferences, are the same for both steam generators in Oconee Units 1, 2, and 3. Therefore, all three units are being documented in this request for relief as described in NRC Inspection Report No. 50-269/95, 50-270/95 and 50-287/95 dated May 5, 1995.

While the examinations have been completed only for Unit 3 at this time, relief is also being sought for Oconee Units 1 and 2 for the same welds. If, for some reason, the actual examination coverages of the welds referenced in this request for relief for Oconee Units 1 and 2 are less than those for Oconee Unit 3, additional request for relief will be submitted on a case by case basis.

Code Requirement

ASME Code, Section XI, 1989 Edition, Examination Category B-D, Items B3.130 and B3.140 require 100 percent volumetric examination of all steam generator outlet nozzle-to-vessel welds and inside radii as defined by Figure IWB-2500-7. The Code requires scanning using two different angles when scanning from the outside surface of the component. When scanning for reflectors parallel to the weld, the angle beams shall be aimed at right angles to the weld axis, with search unit(s) manipulated so that the ultrasonic beams pass through the entire volume of weld metal. The adjacent base metal in the examination volume must be completely scanned by both angle beams from both directions (any combination of two angle beams will satisfy the requirement).

When scanning for reflectors transverse to the weld, the angle beam search units shall be aimed parallel to the axis of longitudinal and circumferential welds. The search unit shall be manipulated so that the ultrasonic beams pass through all of the examination volume. Scanning shall be done in two directions, 180 degrees to each other to the extent possible. Areas blocked by geometric conditions shall be examined from at least one direction.

Code Case N-460 allows credit for full volume coverage of welds if it can be shown that greater than 90 percent of the required volume has been examined.

Code Requirement from which Relief is Requested

Relief is requested from the requirement to examine 100 percent of the volume specified in the ASME Code, Section XI, 1989 Edition, for the steam generator outlet nozzle-to-vessel welds and the outlet nozzle inside radius sections.

Licensee's Basis for Relief

Steam Generator Outlet Nozzle-to-Lower Head Welds 3-SGB-WG50-2 and 3-SGB-WG50-1 (Item Numbers B03.130.003 and B03.130.004) were examined to the maximum extent practical using ultrasonic techniques in accordance with the requirements of ASME Section V, Article 4, and ASME Section XI, Appendix 1, 1989 Edition. Because of geometric conditions, (i.e., single-sided access and support skirt location) only 39.46 percent coverage of the required volume was examined. In order to achieve more coverage, the support skirt would have to be cut away from the nozzle.

Steam Generator Outlet Nozzle-to-Lower Head Inside Radius Sections 3-SGB-WG50-2 and 3-SGB-WG50-1 (Item Numbers B03.140.003 and B03.140.004) were examined to the maximum extent practical using ultrasonic techniques in accordance with the requirements of ASME Section V, Article 4, and ASME Section XI, Appendix 1, 1989 Edition. Because of geometric conditions (i.e. single-sided access and support skirt location) only 44.10 percent coverage of the required volume was examined. In order to achieve more coverage, the support skirt would have to be cut away from the nozzle.

Alternate Examination

Ultrasonic examination of these welds will be performed to the maximum extent practical from the nozzle outside surface. No other examination will be conducted.

2.0 EVALUATION

The staff has evaluated the information provided by the licensee in support of the volumetric examinations of the steam generator outlet nozzle-to-vessel welds and of the nozzle inside radius sections performed during the third 10-year inservice inspection interval. For the subject nozzle-to-vessel welds and the nozzle inside radius sections, the volumetric coverages during scanning are 39.46 percent and 44.10 percent respectively. The staff has determined that the examination coverage was reduced due to geometric configuration of the nozzle which restricted scanning from one side only and due to the interference of the steam generator support skirt that limited access to the area. Therefore, it is impractical to meet the Code requirements. In order to meet the Code requirements, the nozzles would have to be redesigned, fabricated, and installed in the steam generator which would impose significant burden on the licensee.

However, the licensee's best-effort examination resulted in a composite volumetric coverage of approximately 42 percent. The results of examination did not identify any rejectable indication. The staff further believes that, if there were any service-induced flaws existing in the welds and/or in the nozzle inside radius sections, the examination of the accessible weld volume would have at least detected a portion of it with high degree of confidence. Therefore, the staff has determined that the licensee's limited examination of the welds provides a reasonable assurance of the structural integrity of the subject welds and the components.

3.0 CONCLUSION

The staff has reviewed the licensee's submittal and has concluded that the Code requirements are impractical to comply with, due to interference of the support skirt and due to the geometry of the component. The staff has further determined that the examination coverages of the accessible weld volume and of the nozzle inside radius sections that are attained provide a reasonable assurance of the structural integrity of the subject welds and the components. Therefore, the relief is authorized pursuant to 10 CFR 50.55a(g)(6)(i) for the third 10-year inservice inspection interval of Oconee Units 1, 2, and 3. This relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest given due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

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Date: December 20, 1999