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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF NO. 97-01

THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DUKE ENERGY CORPORATION

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

1.0 INTRODUCTION

In order to demonstrate the operability of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) Class 1, 2, and 3 components, the Technical Specifications (TS) for Oconee Nuclear Station, Units 1, 2, and 3, state that the inservice inspection (ISI) ASME Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Code and applicable addenda as required by Title 10 of the Code of Federal Regulations (10 CFR) 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 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 pre-service 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 edition of Section XI of the ASME Code for the Oconee Nuclear Station, Units 1, 2, and 3, third 10-year ISI interval is the 1989 Edition.

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 on the facility.

By letter dated March 13, 1997, the Duke Energy Corporation (licensee), submitted requests for relief to ASME Section XI requirements for Oconee Nuclear Station, Units 1, 2, and 3. The licensee provided additional information by letter dated July 22, 1997.

2.0 EVALUATION

The staff, with technical assistance from its contractor, the Idaho National Engineering and Environmental Laboratory (INEEL), has evaluated the information provided by the licensee in support of its Third 10-Year Inservice Inspection Interval Program Plan Request for Relief No. 97-01, Parts 1 and 2, for Oconee Nuclear Station, Units 1, 2, and 3. Based on the information submitted, the staff adopts the contractor's conclusions and recommendations presented in the attached Technical Letter Report (TLR).

Request for Relief No. 97-01 (Part 1): ASME Code, Section XI, Examination Category B-D, Item B3.110, Pressurizer Spray Nozzle-to-Upper Head Welds, requires 100 percent volumetric examination of all Pressurizer nozzle-to-vessel welds as defined by Figure IWC-2500-7. At least 25 percent but not more than 50 percent (credited) of the nozzles shall be examined by the end of the first inspection period, and the remainder by the end of the inspection interval.

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief from volumetrically examining the following Pressurizer nozzle-to-vessel welds to the extent required by the Code:

Spray Nozzle-to-Upper Head Welds

1-PZR-WP33-1	(Unit 1)
2-PZR-WP33-1	(Unit 2)
3-PZR-WP33-1	(Unit 3)

The licensee proposed as an alternative to: (as stated)

> The use of radiography as an alternate volumetric examination of the welds referenced in this request is not a viable option. Restrictions to performing radiography are primarily due to inability to access the inside of the steam generator and pressurizer to place film or to position a radiographic source.
>
> Duke Power has examined the welds referenced in this request to the maximum extent possible utilizing the latest in examination techniques and equipment. Duke Power will continue to perform ultrasonic examination of all welds identified in Section 1 of this request (for all Units) to the maximum extent practical, within the limits of original design and construction, in accordance with the requirements of ASME Section V, Article 4, and ASME Section XI, Appendix I, 1989 Edition, and Code Case N-460. This will provide reasonable assurance of weld/component integrity. Thus, an acceptable level of quality and safety will have been achieved, and public health and safety will not be endangered by allowing relief from the aforementioned Code requirements.

The Code requires 100 percent volumetric examination of all Pressurizer nozzle-to-vessel welds. However, as shown in the licensee's submittal, the taper on the nozzle side of the weld restricts scanning and prevents complete volumetric coverage of the subject pressurizer nozzle-to-vessel welds. Therefore, the 100 percent volumetric examination is impractical for these nozzle-to-vessel welds. To meet Code examination requirements, modifications to the nozzles would be necessary to allow complete volumetric coverage. Modifications to this portion of the reactor coolant system would create a considerable burden on the licensee.

The licensee has completed a significant portion (76.6 percent) of the Code-required volumetric examination for Spray Nozzle-to-Upper Head Weld 3-PZR-WP33-1. Therefore, any existing patterns of degradation would have been detected and reasonable assurance of the structural integrity has been provided.

For welds listed in this request for relief, the licensee reports that all configurations, including interferences, are the same for Units 1, 2, and 3. Therefore, relief is also being sought for the corresponding welds on Units 1 and 2. If for some reason the actual examination coverage of the corresponding welds referenced for Units 1 and 2 are less than those listed for Unit 3, the licensee must provide additional requests for relief on a case-by-case basis.

Based on the impracticality of meeting the Code coverage requirements for the subject welds, and the reasonable assurance provided by the examinations that were completed/or will be completed, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i), provided that the licensee submits a relief request for any of the subject welds that have an examination coverage area that is less than the area examined on Unit 3 Spray Nozzle-to-Upper Head Weld 3-PZR-WP-33-1.

Request for Relief No. 97-01 (Part 2): ASME Code, Section XI, Examination Category C-A, Item C1.10, Steam Generator Shell Circumferential Welds, requires a 100 percent volumetric examination of Steam Generator shell circumferential welds as defined by Figure IWC-2500-1. Examinations are limited to welds located at gross structural discontinuities as defined in NB-3213.2. In the case of multiple vessels of similar design, size, and service (such as steam generators, heat exchangers), the required examinations may be limited to one vessel or distributed among the vessels.

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief from volumetrically examining the following Steam Generator shell circumferential welds to the extent required by the Code:

1-SGB-WG8-1 (Unit 1)	2-SGB-WG8-2 (Unit 2)
1-SGA-WG8-2 (Unit 1)	3-SGA-WG8-1 (Unit 3)
2-SGA-WG8-1 (Unit 2)	3-SGA-WG8-2 (Unit 3)

The licensee proposed as an alternative to: (as stated)

> The use of radiography as an alternate volumetric examination of the welds referenced in this request is not a viable option. Restrictions to performing radiography are primarily due to inability to access the inside of the steam generator and pressurizer to place film or to position a radiographic source.

Duke Power has examined the welds referenced in this request to the maximum extent possible utilizing the latest in examination techniques and equipment. Duke Power will continue to perform ultrasonic examination of all welds identified in Section 1 of this request (for all Units) to the maximum extent practical, within the limits of original design and construction, in accordance with the requirements of ASME Section V, Article 4, and ASME Section XI, Appendix I, 1989 Edition, and Code Case N-460. This will provide reasonable assurance of weld/component integrity. Thus, an acceptable level of quality and safety will have been achieved, and public health and safety will not be endangered by allowing relief from the aforementioned Code requirements.

The Code requires 100 percent volumetric examination of steam generator shell circumferential welds at gross structural discontinuities. As supported by the drawings provided by the licensee, the taper of the shell plate restricts scanning and prevents complete volumetric coverage of the subject steam generator shell welds. Therefore, the 100 percent volumetric examination is impractical for these circumferential shell welds. To meet the Code examination requirement, modifications to the shell plate geometry or taper would be necessary to allow complete volumetric coverage. Imposition of this requirement would create a considerable burden on the licensee.

The licensee has completed approximately 65.4 percent of the Code-required volumetric examination for Unit 3 welds 3-SGA-WG8-1 and 3-SGA-WG8-2. The staff also noted that, in the licensee's supporting documentation (inspection reports) for the subject Unit 3 welds, several Code-rejectable indications were identified. Four (4) planar flaw indications were identified in Weld 3-SGA-WG8-1, and one (1) planar flaw indication was identified in Weld 3-SGA-WG8-2. These indications ranged from 4.5 percent to 9.0 percent through-wall. In the licensee's July 22, 1997, response to the NRC request for additional information, the licensee reported that these indications have not exhibited any change in flaw sizes throughout their monitoring periods (1982/1992), and that both welds have undergone fracture analysis evaluations. It was stated that fracture analysis was performed by B&W (now Framatome) and the analysis indicated that all flaw indications were found to be acceptable in accordance with the ASME Code, Section XI, 1980 Edition through Winter 1980 Addenda, paragraph IWB-3612. Based on this discussion, existing flaws have remained unchanged and any patterns of new degradation would have been detected. Therefore, reasonable assurance of the structural integrity has been provided.

For welds listed in this request for relief, the licensee reports that all configurations, including interferences, are the same for Units 1, 2, and 3. Therefore, relief is also being sought for the corresponding welds on Units 1 and 2. If for some reason the actual examination coverage of the corresponding welds referenced for Units 1 and 2 are less than those listed for Unit 3, the licensee must provide additional requests for relief on a case-by-case basis.

Based on the impracticality of meeting the Code coverage requirements for the subject welds, and the reasonable assurance provided by the examinations that have been completed/or will be completed, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i), provided that the licensee submits a relief request for any of the subject welds that have an examination coverage area that is less than the area examined on Unit 3 welds 3-SGA-WG8-1 and 3-SGA-WG8-2.

3.0 CONCLUSION

The staff has reviewed the licensee's submittal and concludes that certain inservice examinations cannot be performed to the extent required by the ASME Code at Oconee Nuclear Station, Units 1, 2, and 3. For Request for Relief No. 97-01 (designated Parts 1 and 2 above), the licensee has demonstrated that the Code coverage requirements are impractical. Furthermore, reasonable assurance of the structural integrity of the subject components has been provided by the examinations that have been performed. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for Request for Relief No. 97-01 (Parts 1 and 2), provided that the licensee submits relief requests if actual examination coverage of corresponding Unit 1 and Unit 2 welds is less than the area examined on the listed Unit 3 welds. The relief granted is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden that could result if the requirement were imposed on the facility.

Principal Contributor: T. McLellan

Date: December 18, 1997

TECHNICAL LETTER REPORT
THIRD 10-YEAR INTERVAL INSERVICE INSPECTION
REQUEST FOR RELIEF NO. 97-01
FOR
DUKE POWER COMPANY
OCONEE NUCLEAR STATION, UNITS 1, 2, & 3
DOCKET NUMBERS 50-269, 50-270, & 50-287

1.0 INTRODUCTION

By letter dated March 13, 1997, the licensee, Duke Power Company, submitted Request for Relief No. 97-01 for Oconee Nuclear Station, Units 1, 2, and 3. The licensee stated that based on the examinations performed on Unit 3, relief is also requested for the corresponding welds at Units 1 and 2. Following the initial review of this document, additional information regarding the examinations performed at Unit 3 was requested by the Nuclear Regulatory Commission (NRC) in a letter dated June 5, 1997. The licensee responded to the NRC request for additional information in a letter dated July 22, 1997. The Idaho National Engineering and Environmental Laboratory (INEEL) staff has evaluated the licensee's submittals in the following section.

2.0 EVALUATION

The Code of record for the Oconee Nuclear Station, Units 1, 2, and 3, third 10-year inservice inspection (ISI) interval is the 1989 Edition of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. The information provided by the licensee in support of the requests for relief has been evaluated and the bases for disposition are documented below.

2.1 Request for Relief No. 97-01 (Part 1), Examination Category B-D, Item B3.110, Pressurizer Spray Nozzle-to-Upper Head Welds

Code Requirement: Examination Category B-D, Item B3.110 requires 100% volumetric examination of all Pressurizer nozzle-to-vessel welds as defined by Figure IWC-2500-7. At least 25% but not more than 50% (credited) of the nozzles shall be examined by the end of the first inspection period, and the remainder by the end of the inspection interval.

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief from volumetrically examining the following Pressurizer nozzle-to-vessel welds to the extent required by the Code:

Spray Nozzle-to-Upper Head Welds

1-PZR-WP33-1 (Unit 1)

2-PZR-WP33-1 (Unit 2)

3-PZR-WP33-1 (Unit 3)

Licensee's Basis for Requesting Relief (as stated):

"Pressurizer Nozzle-to-Shell Weld 3-PZR-WP33-1 (Item Number B03.110.005) was 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 I, 1989 Edition.

"Due to part geometry, obtaining at least 90% of the weld length as outlined in Code Case N-460 is not possible with existing ultrasonic techniques.

"The weld is limited to 76.6% coverage of the required volume because of the nozzle configuration."

Licensee's Proposed Alternative (as stated):

"The use of radiography as an alternate volumetric examination of the welds referenced in this request is not a viable option. Restrictions to performing radiography are primarily due to inability to access the inside of the steam generator and pressurizer to place film or to position a radiographic source.

"Duke Power has examined the welds referenced in this request to the maximum extent possible utilizing the latest in examination techniques and equipment. Duke Power will continue to perform ultrasonic examination of all welds identified in Section 1 of this request (for all Units) to the maximum extent practical, within the limits of original design and construction, in accordance with the requirements of ASME Section V, Article 4, and ASME Section XI, Appendix I, 1989 Edition, and Code Case N-460. This will provide reasonable assurance of weld/component integrity. Thus, an acceptable level of quality and safety will have been achieved, and public health and safety will not be endangered by allowing relief from the aforementioned Code requirements."

Evaluation: The Code requires 100% volumetric examination of all Pressurizer nozzle-to-vessel welds. However, as shown in the licensee's submittal, the taper on the nozzle side of the weld restricts scanning and prevents complete volumetric coverage of the subject Pressurizer nozzle-to-vessel welds. Therefore, the 100% volumetric examination is impractical for these nozzle-to-vessel welds. To meet Code examination requirements, modifications to the nozzles would be necessary to allow complete volumetric coverage. Modifications to this portion of the reactor coolant system would create a considerable burden on the licensee.

The licensee has completed a significant portion (76.6%) of the Code-required volumetric examination for Spray Nozzle-to-Upper Head Weld 3PZR-WP33-1. Therefore, any existing patterns of degradation would have been detected and reasonable assurance of the structural integrity has been provided.

For welds listed in this request for relief, the licensee reports that all configurations, including interferences, are the same for Units 1, 2, and 3. Therefore, relief is also being sought for the corresponding welds on Units 1 and 2. If for some reason the actual examination coverage of the corresponding welds referenced for Units 1 and 2 are less than those listed for Unit 3, the licensee must provide additional requests for relief on a case by case basis.

Based on the impracticality of meeting the Code coverage requirements for the subject welds, and the reasonable assurance provided by the examinations that

were completed/or will be completed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.2 Request for Relief No. 97-01 (Part 2), Examination Category C-A, Item C1.10, Steam Generator Shell Circumferential Welds

Code Requirement: Examination Category C-A, Item C1.10 requires a 100% volumetric examination of Steam Generator shell circumferential welds as defined by Figure IWC-2500-1. Examinations are limited to welds located at gross structural discontinuities as defined in NB-3213.2. In the case of multiple vessels of similar design, size, and service (such as steam generators, heat exchangers), the required examinations may be limited to one vessel or distributed among the vessels.

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief from volumetrically examining the following Steam Generator shell circumferential welds to the extent required by the Code:

1-SGB-WG8-1 (Unit 1)	2-SGB-WG8-2 (Unit 2)
1-SGA-WG8-2 (Unit 1)	3-SGA-WG8-1 (Unit 3)
2-SGA-WG8-1 (Unit 2)	3-SGA-WG8-2 (Unit 3)

Licensee's Basis for Requesting Relief (as stated):

"Pressure Retaining Welds in Pressure Vessels, circumferential shell Welds 3-SGA-WG8-1 and 3-SGA-WG8-2 (Item Number C01.010.001 and C01.010.002 respectively) 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 I, 1989 Edition. Reference Attachment A[1] for drawing.

"Due to part geometry, obtaining at least 90% of the weld length as outlined in Code Case N-460 is not possible with existing ultrasonic techniques.

"This weld is limited to 65.4% coverage of the required volume because of shell geometry, i.e., taper."

Licensee's Proposed Alternative (as stated):

"The use of radiography as an alternate volumetric examination of the welds referenced in this request is not a viable option. Restrictions to performing radiography are primarily due to inability to access the inside of the steam generator and pressurizer to place film or to position a radiographic source.

"Duke Power has examined the welds referenced in this request to the maximum extent possible utilizing the latest in examination techniques and equipment. Duke Power will continue to perform ultrasonic examination of all welds identified in

[1] Drawings included in the licensee's submittal are not part of this report.

Section 1 of this request (for all Units) to the maximum extent practical, within the limits of original design and construction, in accordance with the requirements of ASME Section V, Article 4, and ASME Section XI, Appendix I, 1989 Edition, and Code Case N-460. This will provide reasonable assurance of weld/component integrity. Thus, an acceptable level of quality and safety will have been achieved, and public health and safety will not be endangered by allowing relief from the aforementioned Code requirements."

Evaluation: The Code requires 100% volumetric examination of Steam Generator shell circumferential welds at gross structural discontinuities. As supported by the drawings provided by the licensee, the taper of the shell plate restricts scanning and prevents complete volumetric coverage of the subject steam generator shell welds. Therefore, the 100% volumetric examination is impractical for these circumferential shell welds. To meet the Code examination requirement, modifications to the shell plate geometry or taper would be necessary to allow complete volumetric coverage. Imposition of this requirement would create a considerable burden on the licensee.

The licensee has completed approximately 65.4% of the Code-required volumetric examination for Unit 3 welds 3-SGA-WG8-1 and 3-SGA-WG8-2. The INEEL staff also noted that, in the licensee's supporting documentation (inspection reports) for the subject Unit 3 welds, several Code-rejectable indications were identified. Four (4) planar flaw indications were identified in Weld 3-SGA-WG8-1, and one (1) planar flaw indication was identified in Weld 3-SGA-WG8-2. These indications ranged from 4.5% to 9.0% through wall. In the licensee's July 22, 1997, response to the NRC request for additional information, the licensee reported that these indications have not exhibited any change in flaw sizes throughout their monitoring periods (1982/1992), and that both welds have undergone fracture analysis evaluations. It was stated that, fracture analysis was performed by B&W (now Framatome) and the analysis indicated that all flaw indications were found to be acceptable per ASME Section XI, 1980 Edition through Winter 1980 Addenda, paragraph IWB-3612. Based on the discussion above, existing flaws have

remained unchanged and any patterns of new degradation would have been detected. Therefore, reasonable assurance of the structural integrity has been provided.

For welds listed in this request for relief, the licensee reports that all configurations, including interferences, are the same for Units 1, 2, and 3. Therefore, relief is also being sought for the corresponding welds on Units 1 and 2. If for some reason the actual examination coverage of the corresponding welds referenced for Units 1 and 2 are less than those listed for Unit 3, the licensee must provide additional requests for relief on a case by case basis.

Based on the impracticality of meeting the Code coverage requirements for the subject welds, and the reasonable assurance provided by the examinations that have been completed/or will be completed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

3.0 CONCLUSION

The INEEL staff has reviewed the licensee's submittal and concludes that certain inservice examinations cannot be performed to the extent required by the Code at Oconee Nuclear Station, Units 1, 2, and 3. For Request for Relief No. 97-01 (Part 1 and Part 2), the licensee has demonstrated that the Code coverage requirements are impractical. Furthermore, reasonable assurance of the structural integrity of the subject components has been provided by the examinations that have been performed. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i) for Request for Relief No. 97-01.