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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

OF THE SECOND 10-YEAR INTERVAL INSERVICE INSPECTION

REQUESTS FOR RELIEF 92-12 AND 92-13

FOR

DUKE POWER COMPANY

OCONEE NUCLEAR STATION, UNIT 3

DOCKET NUMBER: 50-287

1.0 INTRODUCTION

The Technical Specifications for Oconee Nuclear Station state that the inservice inspection and testing 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 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). 10 CFR 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 difficulties 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 second 10-year interval 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) on the date 12 months prior to the start of the 120-month inspection interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the Oconee Nuclear Station, second 10-year inservice inspection (ISI) interval is the 1980 Edition through Winter 1980 Addenda. 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.

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 letters dated September 22, 1992, and November 10, 1992, the licensee, Duke Power Company, submitted Requests for Relief No. 92-12 and 92-13, respectively, requesting relief from performing 100% of the Code-required volumetric or surface examinations for Class 1 and 2 welds. By letters dated February 3, 1994, and July 20, 1994, the licensee provided additional information regarding the steam generator nozzle-to-vessel weld, and reactor pressure vessel flange threads contained in Request for Relief No. 92-12.

2.0 EVALUATION

The staff, with technical assistance from its contractor, the Idaho National Engineering Laboratory (INEL), has evaluated the information provided by the licensee in support of subject relief requests as follows:

A. Request for Relief No. 92-12 (Part A), Examination Category B-A, Items B1.21 and B1.40, Reactor Pressure Vessel (RPV) Circumferential Head and Head-to-Flange Welds

Code Requirement: Table IWB-2500-1, Examination Category B-A, Item B1.21 requires a 100% volumetric examination of the accessible length of one circumferential head weld as defined by Figures IWB-2500-3. Item B1.40 requires 100% surface and volumetric examination of the head-to-flange weld as defined by Figure IWB-2500-5.

Licensee's Code Relief Request: The licensee has requested relief from performing the volumetric examinations, to the extent required by the Code, for RPV circumferential head weld B01.021.001B and RPV head-to-flange Weld B01.040.001B.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized from Attachment 1 of its submittal as follows: Examination of the subject welds is limited by component geometry, lifting lugs, and a service structure support that restrict access to the examination area. For the circumferential head weld, 80% of the full volume examination and 82% of the near-surface examination can be performed. For the flange-to-head weld, 49% of the full volume, and 63% of the near-surface examination can be performed.

Licensee's Proposed Examination: The licensee proposed to perform the Code-required ultrasonic examination to the maximum extent practical.

Staff Evaluation: The Code requires a 100% volumetric examination of the accessible length of one RPV circumferential head weld, and surface

and volumetric examination of the closure head-to-flange weld. However, access to the subject welds is limited by physical obstructions (i.e., component geometry, lifting lugs, and a service structure support) that restrict the performance of the Code-required examinations. Therefore, the volumetric examinations are impractical to perform to the extent required by the Code. In order to complete the Code-required volumetric examinations, design modifications of the RPV closure head would be necessary. Accordingly, this requirement would cause a burden on the licensee.

Based on the fact that the Code-required volumetric examinations are impractical, and considering that a significant portion of the Code-required volumetric examinations can and will be performed, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i). The limited volumetric examination, along with the Code-required surface examination of the head-to-flange weld, will provide reasonable assurance of the continued structural integrity of these welds.

B. Request for Relief No. 92-12 (Part B), Examination Category B-B, Item B2.11, B2.12, and B2.40, Pressurizer Shell-to-Head Welds and Steam Generator Tubesheet-to-Head Welds

Code Requirement: Table IWB-2500-1, Examination Category B-B, Items B2.11 and B2.40, require 100% volumetric examination of the pressurizer circumferential shell-to-head welds, and steam generator tubesheet-to-head welds as defined by Figures IWB-2500-1, and -6, respectively. Item B2.12 requires volumetric examination of one foot of one longitudinal weld per head during successive inspection intervals as defined by Figure IWB-2500-2.

Licensee's Code Relief Request: The licensee has requested relief from performing the volumetric examinations of the following pressurizer circumferential and longitudinal head-to-shell and steam generator tubesheet-to-head welds:

Weld ID	Code Item#	Percent Completed	Description of Limitation
B02.011.006	B2.11	84%	Component geometry (i.e., heater bundle forging taper)
B02.012.004	B2.12	86%	Component geometry and vertical and horizontal heater bundle taper

B02.012.005	B2.12	86%	Component geometry and vertical and horizontal heater bundle taper
B02.040.001	B2.40	70%	Component geometry and location of primary manway
B02.040.003	B2.40	70%	Component geometry and location of primary manway

Licensee's Basis for Requesting Relief: The licensee's basis is summarized from Attachment 1 of its submittal as follows: The limitations listed above restrict access and preclude performance of the 100% volumetric examination for the subject welds.

Licensee's Proposed Examination: The licensee proposed to examine a portion of two welds on the same head.

Staff Evaluation: The Code requires a 100% volumetric examination of the pressurizer circumferential shell-to-head welds and steam generator tubesheet-to-head welds. However, examination of the subject welds is limited by component geometry and the steam generator primary manways.

Therefore, the Code requirements are impractical for these welds at Oconee Nuclear Station, Unit 3. In order to perform the examinations to the extent required by the Code, the pressurizer and steam generators would require design modifications to allow access for the required examinations. Accordingly, this requirement would cause a burden on the licensee.

Based on the fact that the Code-required examinations are impractical, and considering that a significant portion of each weld can be examined, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for Welds B02.011.006, B02.040.001, and B02.040.003.

For the Item B2.12 welds, the Code requires the examination of one foot of one longitudinal shell-to-head weld on each head during the second ISI interval. In lieu of examining one foot of one weld, the licensee has examined a portion (86%) of two welds. Thus, the licensee's proposed alternative examination has met or exceeded the Code requirements. Therefore, the staff concludes that pursuant to 10 CFR 50.55a(a)(3)(i), the licensee's proposed alternative examination is authorized for Welds B02.012.004 and B02.012.005. The licensee's proposed alternative of examining a portion of two welds on the same head will provide an acceptable level of quality and safety.

C. Request for Relief No. 92-12 (Part C), Examination Category B-D, Item B3.130, Steam Generator Nozzle-to-Vessel Welds

Code Requirement: Table IWB-2500-1, Examination Category B-D, Item B3.130, requires a 100% volumetric examination of all Class 1 steam generator nozzle-to-vessel welds as defined by Figure IWB-2500-7.

Licensee's Code Relief Request: The licensee has requested relief from performing the volumetric examination of Welds B03.130.002, B03.130.005, and B03.130.006 to the extent required by the Code.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized from Attachment 1 of its submittal as follows: For the steam generator lower head-to-outlet nozzle weld, access is restricted by component geometry and the location of the support skirt which limits coverage to approximately 16% of the required volume. In the February 3, 1994, letter, the licensee stated that the percentage given for this weld reflects only the coverage meeting the Code requirements for calculating examination coverage, and that in actuality, 53% of this weld was examined in at least one direction from one side. For the two upper head-to-inlet nozzle welds, access is restricted by nozzle configuration that limits coverage to 49% of the required volume.

In addition, the licensee stated: "The Construction Permit for Oconee was issued on November 6, 1967. 10 CFR 50.55a(g) allows for plants whose Construction Permit was issued prior to January 1, 1971 to meet the requirements of ASME Section XI to the extent practical within the limitations of design, geometry and materials of construction of the components. Due to part geometry and actual physical barriers, obtaining examination coverage on at least 90% of the weld volume as required by ASME Section XI, 1980 Edition as modified by Code Case N-460 was not possible."

Licensee's Proposed Examination: The licensee proposed to perform the Code-required ultrasonic examination to maximum extent practical.

Staff Evaluation: The Code requires 100% volumetric examination of all Class 1 steam generator nozzle-to-vessel welds. However, as stated by the licensee and as shown on the drawings provided in the licensee's submittal, examination of these nozzle-to-vessel welds is limited by component geometry and/or the steam generator support skirt. These physical obstructions preclude the 100% volumetric examination and make the Code requirements impractical. In order to perform the 100% ultrasonic examination, the steam generator would have to be redesigned and modified to allow access for examination. Accordingly, this requirement would cause a burden on the licensee.

Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), relief is granted provided that all of the other Class 1 stream generator nozzle-to-vessel welds are being examined to the extent practical. For Class 1 steam generator nozzle-to-vessel Weld Nos. B03.130.005 and B03.130.006, the limited examinations should detect patterns of degradation that could occur and will provide reasonable assurance of the continued structural integrity of those welds. In the case of the lower head-to-outlet nozzle for steam generator (SG) "A" (Weld No. B03.130.002), the licensee stated that over 50% of this weld was examined in at least one direction. This examination should have detected any significant patterns of degradation that could have occurred. Therefore, reasonable assurance of the operational readiness of this weld has been provided.

D. Request for Relief No. 92-12 (Part D), Examination Category B-F, Item B5.50, Dissimilar Metal Piping Welds

Code Requirement: Table IWB-2500-1, Examination Category B-F, Item B5.50, requires 100% surface and volumetric examinations as defined by IWB-2500-8 for all dissimilar metal butt welds in piping greater than 4 inches in diameter.

Licensee's Code Relief Request: The licensee has requested relief from performing 100% of the Code-required volumetric examination for the following welds:

Weld ID	Percent Completed	Configuration	Description of limitation
B05.050.006	85%	RCP B1 -- Safe end-to-45° elbow	Taper on pipe
B05.050.008	85%	RCP B2 -- Safe end-to-45° elbow	Taper on pipe
B05.050.010	61%	Low Pressure Injection System safe end-to-pipe	Nozzle configuration
B05.050.013	61%	Low Pressure Injection System safe end-to-pipe	Nozzle configuration

Licensee's Basis for Requesting Relief: The licensee's basis is summarized from Attachment 1 of its submittal as follows: The limitations listed above restrict access and preclude performance of the 100% volumetric examination for the subject welds.

Licensee's Proposed Examination: The licensee proposed to perform the Code required ultrasonic examination to the maximum extent practical.

Staff Evaluation: The Code requires 100% surface and volumetric examinations for the subject welds. However, the component geometry precludes performance of the 100% volumetric examination and makes the Code requirement impractical for these welds. In order to perform the volumetric examination to the extent required by the Code, the configuration of the subject welds would have to be modified to allow access for complete examination. Accordingly, this requirement would cause a burden on the licensee.

Considering: (1) that the component geometry precludes performance of the 100% volumetric examination and makes the Code requirement

impractical for these welds, (2) that a significant portion of the Code-required examinations is being performed, and (3) that these welds are included in a larger population of other similar welds that are receiving 100% volumetric examinations, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i). The limited volumetric examination, along with the Code-required surface examinations and pressure test will provide reasonable assurance of the continued structural integrity of the subject welds.

E. Request for Relief No. 92-12 (Part E), Examination Category B-G-1, Item B6.40, Reactor Pressure Vessel (RPV) Flange Threads

Code Requirement: Table IWB-2500-1, Examination Category B-G-1, Item B6.40, requires a volumetric examination of the threads in the RPV flange as defined by IWB-2500-12.

Licensee's Code Relief Request: The licensee has requested relief from performing the volumetric examination of the threads in the RPV flange to the extent required by the Code.

Licensee's Basis for Requesting Relief: The licensee's basis is summarized from Attachment 1 of its submittal as follows: The RPV flange geometry restricts access to the examination area and limits coverage to 78% of the Code-required volume.

Licensee's Proposed Alternative Examination: The licensee proposed to perform the Code-required ultrasonic examination to the maximum extent practical.

Staff Evaluation: The Code requires a volumetric examination of the threads in the RPV flange. From the drawings provided by the licensee the staff determined that it is possible to perform the Code-required examinations, and per the licensee's submittal dated July 20, 1994, the licensee stated that it could do the inspections. Therefore, this request is denied. The licensee's submittal dated July 20, 1994, that contains the above information is a new Request for Relief No. 94-05 that will be evaluated in a separate document.

F. Request for Relief No. 92-12 (Part F), Examination Category C-A, Item C1.10, Steam Generator Circumferential Shell Welds

Code Requirement: Table IWB-2500-1, Examination Category C-A, Item C1.10, requires a 100% volumetric examination of circumferential shell welds at gross structural discontinuities as defined by IWB-2500-1.

Licensee's Code Relief Request: The licensee has requested relief from performing the volumetric examination to the extent required by the Code for the following steam generator welds:

Weld Identification	% Completed	Limitation
C01.010.001	64%	Component geometry and location of manway
C01.010.002	69%	Component geometry
C01.010.003	69%	Component geometry
C01.010.004	69%	Component geometry, manway and two J-leg supports

Licensee's Basis for Requesting Relief: The licensee's basis is summarized from Attachment 1 of its submittal as follows: Limitations listed above preclude performance of the 100% volumetric examination.

Licensee's Proposed Examination: The licensee proposed to perform the Code ultrasonic examinations to the maximum extent practical.

Staff Evaluation: The Code requires volumetric examination of the subject steam generator welds. However, examination of these welds is restricted due to physical obstructions that limit access to the examination volume. These obstructions preclude 100% volumetric examination of the welds and make the Code requirements impractical at Oconee Nuclear Station, Unit 3. In order to perform the volumetric examination to the extent required by the Code, the steam generator would have to be redesigned and modified to allow access for examination. Accordingly, the requirement would cause a burden on the licensee.

Based on the fact that obstructions preclude 100% volumetric examination of the welds and make the Code requirements impractical at Oconee Nuclear Station, Unit 3, and considering that a significant portion of the Code-required examination can be performed, the staff concludes that relief may be granted pursuant to 10 CFR 50.55a(g)(6)(i). The limited examination will provide reasonable assurance of continued structural integrity of the subject steam generator welds.

G. Request for Relief No. 92-13, Examination Category C-F, Item C5.11, Surface Examination of Pipe Weld 3-53B-33-28

Code Requirement: Table IWC-2500-1, Examination Category C-F, Item C5.11, requires a 100% surface examination as defined by Figure IWC-2500-7 for circumferential piping welds less than 1/2 inch nominal wall thickness.

Licensee's Code Relief Request: The licensee has requested relief from performing the surface examination of Low Pressure Injection (LPI) Weld 3-53B-33-28 to the extent required by the Code.

Licensee's Basis for Requesting Relief: The licensee has stated: "The Construction Permit for Oconee was issued on November 6, 1967. 10 CFR 50.55a(g) allows plants whose construction permits were issued prior to January 1, 1971 to meet the requirements of ASME Section XI to the extent practical within the limitations of design, geometry, and materials of construction of the components.

Weld 3-53B-33-28 is on a 14 inch, schedule 10, stainless steel pipe. The design parameters for this pipe are 388 psig and temperature 300 degrees F. This section of pipe is not used except when the reactor is shut down. This line is one of two lines the LPI pumps can use to take a suction on the emergency sump during an extended emergency situation.

Due to physical obstructions (a pipe saddle), obtaining coverage on at least 90% of the weld volume as required by ASME Section XI, 1980 Edition as modified by Code Case N-460, is not possible. A total of 80% of the, weld was examined by liquid penetrant method and was found to be acceptable. The 20% that is inaccessible is on the bottom side of the pipe. This section was visually inspected and no indications of leaks were observed. In addition, this line is scheduled to receive a VT-2 functional test at normal operating conditions this outage.

Based on the results of the liquid penetrant and visual examinations that were performed, and the functional test which verified that there were no leaks at normal operating conditions, there is no danger to the health and safety of the general public."

Licensee's Proposed Examination: The licensee proposed to perform the Code surface examination to the extent practical in addition to the Code-required pressure tests.

Staff Evaluation: The Code requires a 100% surface examination of Weld 3-53B-33-28. However, the lower portion of the subject weld is inaccessible due to a pipe saddle that obstructs access to 20% of the weld. Therefore, the surface examination is impractical to perform to the extent required by the Code. In order to perform 100% of the Code-required surface examination, design modifications of the pipe saddle would be necessary to allow sufficient access to the weld. Considering that the Code requirements are impractical to perform at Oconee Nuclear Station, Unit 3, pursuant to 10 CFR 50.55a(g)(6)(i) relief may be granted. The limited surface examination, along with the Code-required pressure tests, will provide an acceptable level of quality and safety.

3.0 CONCLUSION

Paragraph 10 CFR 50.55a(g)(4) requires that components (including supports) that are classified as ASME Code Class 1, 2, and 3 meet the requirements, except design and access provisions and preservice requirements, set forth in

applicable editions of ASME Section XI to the extent practical within limitations of design, geometry, and materials of construction of the components.

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee concluded that conformance with certain Code requirements is impractical for its facility and submitted supporting information. The staff has reviewed the licensee's submittal and has concluded that the requirements of the Code are impractical, and that pursuant to 10 CFR 50.55a(g)(6)(i), relief may be granted as requested for Request for Relief 92-13, and for all parts of Request for Relief 92-12 (except as stated below). Such relief is authorized by law and will not endanger life, property, or the common defense and security, and is otherwise in the public interest.

For the alternative contained in Request for Relief 92-12 (Part B), pressurizer Welds B02.012.004 and B02.012.005, the alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i). Part E of Request for Relief 92-12 is denied.

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Date: September 29, 1994