



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
OF THE FIRST TEN-YEAR INTERVAL INSERVICE INSPECTION

REQUEST FOR RELIEF NO. 95-01

FOR

DUKE POWER COMPANY, ET AL.

CATAWBA NUCLEAR STATION, UNIT 1

DOCKET NUMBER: 50-413

1.0 INTRODUCTION

The Technical Specifications for Catawba Nuclear Station, Unit 1, state that 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) 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 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 first ten-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) on the date twelve 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 Catawba Nuclear Station, Unit 1 first 10-year inservice inspection (ISI) interval is the 1980 Edition through Winter 1981 Addenda.

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.

In a letter dated May 16, 1995, Duke Power Company (the licensee) submitted to the NRC Request for Relief No. 95-01 (Parts 1, 2, and 3) which is associated with the first 10-year interval inservice inspection program plan for the Catawba Nuclear Station, Unit 1.

2.0 EVALUATION AND CONCLUSIONS

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 its first 10-year interval inservice inspection program plan, Request for Relief No. 95-01 (Parts 1, 2, and 3) for the Catawba Nuclear Station, Unit 1.

Based on the information submitted, the staff adopts the contractor's conclusions and recommendations presented in the attached Technical Letter Report. The staff has concluded that compliance with the Code requirements would be impractical and a burden on the licensee. In addition, the proposed testing will provide reasonable assurance of operational readiness of the subject systems in Request for Relief 95-01 (Parts 1, 2, and 3). Therefore, Request for Relief No. 95-01 (Parts 1, 2, and 3) is granted as requested pursuant to 10 CFR 50.55a(g)(6)(i).

Attachment: Technical Letter Report

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Date: August 31, 1995

TECHNICAL LETTER REPORT ON THE
FIRST 10-YEAR INTERVAL INSERVICE INSPECTION
REQUEST FOR RELIEF No. 95-01
FOR
DUKE POWER COMPANY
CATAWBA NUCLEAR STATION, UNIT 1
DOCKET NUMBER: 50-413

1.0 INTRODUCTION

In a letter dated May 16, 1995, the licensee, Duke Power Company, submitted Request for Relief No. 95-01. This request for relief is applicable for the first 10-year inservice inspection (ISI) interval at Catawba Nuclear Station, Unit 1. The Idaho National Engineering Laboratory (INEL) staff has evaluated the subject request for relief in the following section.

2.0 EVALUATION

The Code of record for the Catawba Nuclear Station, Unit 1, first 10-year ISI interval is the *American Society of Mechanical Engineers Boiler and Pressure Vessel Code*, Section XI, 1980 Edition through Winter 1981 Addenda. The information provided by the licensee in support of the request for relief has been evaluated and the basis for disposition is documented below.

A. Request for Relief No. 95-01 (Part 1), Examination Category B-M-1, Item B12.40, Valve Body Welds

Code Requirement: Table IWB-2500-1, Examination Category B-M-1, Item B12.40, requires 100% volumetric examination of valve body welds \geq 4-inch NPS, as defined by Figure IWB-2500-17.

Licensee's Code Relief Request: The licensee requested relief from performing a volumetric examination, to the extent required by the Code, on valve body Weld IND-37A.

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

"During the ultrasonic examination of the welds shown in Attachment 1,¹ two directional coverage as required by ASME Section XI, Appendix III and Section V, Article IV as modified by Code Case N-460 could not be obtained. Causes of these limitations are part geometry, physical barriers, and component/weld material. Where possible, a combination of angles and wave modes were used to maximize the coverage obtained. The weld and base metal at the component inside surface was covered from at least one direction with a minimum of one angle.

¹ Attachment was included as part of the licensee's submittal, but is not included in this report.

"Limitations are permanent obstructions and cannot be removed for the components/welds listed. Although the coverage requirements of ASME Section XI, as defined in Section V, Article 4 and Section XI, Appendix III could not be met, the amount of coverage obtained for these examinations provides an acceptable level of quality and integrity. Based on these evaluations, it is Duke Power Company's opinion that the limited coverage will not endanger the health and safety of the general public.

"The use of radiography as an alternate volumetric examination method is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the necessity to use double wall techniques due to inaccessibility of the ID surface and physical barriers prohibiting access for placement of source, film, number bands, etc. We will continue to use the most current ultrasonic techniques available to obtain maximum coverage for future examinations of these weld numbers."

Licensee's Proposed Alternative Examination (as stated):

"No additional examinations are planned for Weld IND-37A."

Evaluation: The licensee provided an "ISI Limitation Report"² that gives the layout of Weld IND-37A. The layout shows weld geometry that limits ultrasonic scanning, thus precluding examination of approximately 16% of the weld volume. As a result, 100% volumetric examination of the Code-required area is impractical. To obtain complete volumetric coverage, design modifications would be required. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee proposed no alternative examination. However, approximately 86% of the Code-required volumetric examination was performed. Based on this significant amount of coverage, it is reasonable to conclude that degradation, if present, would have been detected. Thus, reasonable assurance of continued inservice structural integrity has been provided. Therefore, it is recommended that relief be granted as requested, pursuant to 10 CFR 50.55a(g)(6)(i).

B. Request for Relief No. 95-01 (Part 2), Examination Category C-A, Item C1.10, Steam Generator Lower Shell-to-Transition Cone Circumferential Weld

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

² ISI Limitation Reports were included in the licensee's submittal, but are not included in this report.

Licensee's Code Relief Request: The licensee requested relief from performing a volumetric examination, to the extent required by the Code, on the steam generator lower shell to transition cone Weld ISGC-04B-05.

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

"During the ultrasonic examination of the welds shown in Attachment 1,³ two directional coverage as required by ASME Section XI, Appendix III and Section V, Article IV as modified by Code Case N-460 could not be obtained. Causes of these limitations are part geometry, physical barriers, and component/weld material. Where possible, a combination of angles and wave modes were used to maximize the coverage obtained. The weld and base metal at the component inside surface was covered from at least one direction with a minimum of one angle.

"Limitations are permanent obstructions and cannot be removed for the components/welds listed. Although the coverage requirements of ASME Section XI, as defined in Section V, Article 4 and Section XI, Appendix III could not be met, the amount of coverage obtained for these examinations provides an acceptable level of quality and integrity. Based on these evaluations, it is Duke Power Company's opinion that the limited coverage will not endanger the health and safety of the general public.

"The use of radiography as an alternate volumetric examination method is not practical due to component thickness and geometric configurations. Other restrictions making radiography impractical are the necessity to use double wall techniques due to inaccessibility of the ID surface and physical barriers prohibiting access for placement of source, film, number bands, etc. We will continue to use the most current ultrasonic techniques available to obtain maximum coverage for future examinations of these weld numbers."

Licensee's Proposed Alternative Examination (as stated):

"No additional examinations are planned for Weld ISGC-04B-05."

Evaluation: The licensee provided an "ISI Limitation Report"⁴ that gives the layout of Weld ISGC-04B-05. The layout shows a permanent restraint ring that limits ultrasonic scanning, thus precluding examination of approximately 48% of the weld volume. As a result, 100%

³ Attachment was included as part of the licensee's submittal, but is not included in this report.

⁴ ISI Limitation Reports were included in the licensee's submittal, but are not included in this report.

volumetric examination of the Code-required area is impractical. To obtain complete volumetric coverage, design modifications would be required. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee proposed no alternative examination. However, approximately 52% of the Code-required volumetric examination was performed. Based on this coverage achieved, it is reasonable to conclude that degradation, if present, would have been detected. Thus, reasonable assurance of continued inservice structural integrity has been provided. Therefore, it is recommended that relief be granted as requested, pursuant to 10 CFR 50.55a(g)(6)(i).

C. Request for Relief No. 95-01 (Part 3), Examination Category C-A, Item C1.10, Residual Heat Removal Heat Exchanger Flange-to-Shell Circumferential Weld

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

Licensee's Code Relief Request: The licensee requested relief from performing a volumetric examination, to the extent required by the Code, on the residual heat removal heat exchanger flange-to-shell circumferential Weld 1RHRB-W3.

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

"During the ultrasonic examination of the welds shown in Attachment 1,⁵ two directional coverage as required by ASME Section XI, Appendix III and Section V, Article IV as modified by Code Case N-460 could not be obtained. Causes of these limitations are part geometry, physical barriers, and component/weld material. Where possible, a combination of angles and wave modes were used to maximize the coverage obtained. The weld and base metal at the component inside surface was covered from at least one direction with a minimum of one angle.

"Limitations are permanent obstructions and cannot be removed for the components/welds listed. Although the coverage requirements of ASME Section XI, as defined in Section V, Article 4 and Section XI,

Appendix III could not be met, the amount of coverage obtained for these examinations provides an acceptable level of quality and integrity. Based on these evaluations, it is Duke Power Company's opinion that the limited coverage will not endanger the health and safety of the general public."

⁵ Attachment was included as part of the licensee's submittal, but is not included in this report.

Licensee's Proposed Alternative Examination (as stated):

"For Weld ID 1RHRB-W3, radiography will be used as an alternate volumetric examination method upon completion of a modification to the heat exchanger to allow access to the ID surface for source positioning and the qualification of an acceptable radiographic technique. This radiographic examination will be performed during Unit 1 EOC9, which is the first refueling outage in the Second Ten-Year Inspection Interval."

Evaluation: The licensee provided an "ISI Limitation Report"⁶ that gives the layout of Weld 1RHRB-W3. The layout shows flange geometry and bolting that limits ultrasonic scanning, thus precluding examination of approximately 78% of the weld volume. As a result, 100% volumetric examination of the Code-required area is impractical. To obtain complete volumetric coverage, design modifications would be required. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee has proposed using radiography as an alternate volumetric examination method. However, a modification to the heat exchanger must be completed to allow access to the ID surface for source positioning and the qualification of an acceptable radiographic technique. This radiographic examination will be performed during Unit 1 EOC9, which is the first refueling outage in the Second 10-Year Inspection Interval. Although this exam will be performed after the close of the first inspection interval, it will greatly enhance the 22% of the Code-required volumetric examination achieved using ultrasonic techniques. Therefore, based on the coverage obtained and the radiographic examination scheduled during the first outage of the second inspection interval, it is reasonable to conclude that degradation, if present, would be detected. Thus, reasonable assurance of continued inservice structural integrity will be provided. Therefore, it is recommended that relief be granted as requested, pursuant to 10 CFR 50.55a(g)(6)(i).

3.0 CONCLUSION

The INEL staff has reviewed the licensee's submittal and concludes that the requirements of the Code are impractical and recommends that relief be granted for Request for Relief No. 95-01, Parts 1 through 3, pursuant to 10 CFR 50.55a(g)(6)(i). 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.

Date:

⁶ ISI Limitation Reports were included in the licensee's submittal, but are not included in this report.