

April 3, 2006

Mr. Dhiaa Jamil
Vice President
Catawba Nuclear Station
Duke Energy Corporation
4800 Concord Road
York, SC 29745

SUBJECT: CATAWBA NUCLEAR STATION, UNIT 2, REQUEST FOR RELIEF FROM THE REQUIREMENTS OF THE ASME CODE (TAC NOS. MC7004, MC9197, MC9198, MC9199, MC9200, MC9201, MC 9202, MC9203, MC9204, MC9205, MC9206 AND MC9207).

Dear Mr. Jamil:

By letter dated May 11, 2005, Duke Energy Corporation (the licensee) submitted Relief Request No. 05-CN-003 (11 requests). The request asked for relief from the American Society of Mechanical Engineers (ASME), *Boiler and Pressure Vessel Code* (Code), Section XI, 1989 edition requirement pertaining to limited weld examination coverage. This request is applicable to the end of the operating cycle 13 inspection, during the second 10-year inservice inspection (ISI) interval at Catawba Nuclear Station, Unit 2 (Catawba Unit 2).

The enclosed Safety Evaluation contains the Nuclear Regulatory Commission (NRC) staff's evaluation and conclusions. Based on the information provided in the relief request, the NRC staff has determined that it is impractical for the welds identified to be examined to the extent required by the ASME Code at Catawba Unit 2. In addition, reasonable assurance of structural integrity is provided by the examinations performed by the licensee.

Therefore, relief is granted pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a(g)(6)(i) for the second 10-year ISI interval at Catawba Unit 2.

Sincerely,

/RA/
Evangelos C. Marinos, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-414

Enclosure: Safety Evaluation

cc w/encl: See next page
Mr. Dhiaa Jamil

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The enclosed Safety Evaluation contains the Nuclear Regulatory Commission (NRC) staff's evaluation and conclusions. Based on the information provided in the relief request, the NRC staff has determined that it is impractical for the welds identified to be examined to the extent required by the ASME Code at Catawba Unit 2. In addition, reasonable assurance of structural integrity is provided by the examinations performed by the licensee.

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
INSERVICE INSPECTION PROGRAM
REQUEST FOR RELIEF NO. 05-CN-003
CATAWBA NUCLEAR STATION, UNIT 2
DUKE ENERGY CORPORATION
DOCKET NO. 50-414

1.0 INTRODUCTION

ISI of ASME Class 1, Class 2, and Class 3 components is to be performed according to Section XI of the ASME Code and the applicable edition and addenda as required by 10 CFR 50.55a(g), except where specific relief has been granted by the Nuclear Regulatory 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 the applicant demonstrates that: (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) will 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) twelve months prior to the start of the 120-month interval, and are subject to the limitations and modifications listed therein. The ISI Code of record for Catawba Nuclear Station, Unit 2 (CNS2), for the second 10-year ISI interval, which ends on August 19, 2006, is the 1989 edition of the ASME Code with no addenda.

By letter dated May 11, 2005, Duke Energy Corporation (the licensee), submitted Request for Relief No. 05-CN-003, for CNS2 from the volumetric examination coverage requirements for examination categories B-A, B-D, C-A and C-F-1 welds. In the submittal, the licensee submitted End of Cycle 13 (EOC13) nondestructive examination (NDE) data sheets for Steam Generators 2A and 2D inlet and outlet nozzle inside radius sections (component identifications 2SGA-INLET, -OUTLET, and 2SGD-INLET, -OUTLET). These NDE data sheets reflect that 100% coverage was obtained with no recordable indications noted. The EOC13 NDE data sheets supercede the EOC12 NDE data sheets which reflected limited examination coverage. The licensee performed a re-examination during EOC13 with a different ultrasonic (UT)

Enclosure

procedure to obtain 100% coverage for component identification. Therefore, the reliefs granted in this safety evaluation does not include component identifications 2SGA-INLET, -OUTLET, and 2SGD-INLET, -OUTLET. The NRC staff notes that relief for examination coverage requirements for these four components is no longer necessary.

2.0 EVALUATION OF RELIEF REQUESTS

RR 05-CN-003 (5) Examination Limitations For Shell To Lower Head Circumferential Weld 2RPV-101-141

Code Requirements for which Relief is Requested

The 1989 edition of ASME Code, Section XI, Figure IWB-2500-1(b), Code Category B-A, Item No. B1.11, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval.

Component for Which Relief is Requested

Reactor vessel shell to lower head circumferential weld 2RPV-101-141.

Licensee's Proposed Alternative to Code

No alternative offered by the licensee.

Licensee's Basis for Relief

The licensee stated that the subject weld, 2RPV-101-141, configuration is such that the examination coverage is limited by physical interferences from the core support lugs which prevented scanning 100% of the weld length from four orthogonal directions. Pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), the licensee seeks relief from performing the 100% volumetric examination requirements of the ASME Code. In order to gain access to these welds to obtain 100% coverage, a design modification would be necessary to remove the core support lugs which the licensee considers impractical. Approximately 76.8% coverage was obtained for weld 2RPV-101-141 with no reportable indications noted.

Evaluation

The 1989 edition of the ASME Code, Section XI, Table IWB-2500-1, Code Category B-A, Item No. B1.11, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval. The examination volume is defined in Figure IWB-2500-1(b).

The NRC staff reviewed the data submitted by the licensee and concluded that the proximity of several core support lugs to the weld would limit ISI of portions of the weld. There were no recordable indications identified from the licensee's 76.8% coverage data. The NRC staff concludes that the 76.8% of examination coverage obtained would have identified any pattern of degradation should one develop. Furthermore, a change of component design would be necessary to obtain the increased coverage. Requiring the licensee to redesign the subject component to obtain the Code-required volumetric coverage would result in a significant

burden; the examination coverage obtained provides reasonable assurance of the structural integrity of the weld.

Based on the above discussion, the NRC staff concludes that compliance with the Code-coverage requirement is impractical. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the second ISI interval for 2RPV-101-141, for CNS2. 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 giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

RR 05-CN-003 (6) Examination Limitations For Lower Shell Long Seam Weld 2RPV-101-142A

Code Requirements for which Relief is Requested

As stated by the licensee, the 1989 edition of ASME Code, Section XI, Figure IWB-2500-2(b), Code Category B-A, Item No. B1.12, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval.

Component for Which Relief is Requested

Lower shell long seam weld 2RPV-101-142A at 60 degrees azimuth.

Licensee's Proposed Alternative to Code

No alternative offered by the licensee.

Licensee's Basis for Relief

The licensee stated that examination of the subject weld, 2RPV-101-142A, is limited by physical interferences from the core support lugs. The weld configuration prevented scanning 100% of the weld length from four orthogonal directions. Pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), the licensee seeks relief from performing the 100% volumetric examination requirements of the ASME Code. To gain access to these welds and obtain 100% coverage, a design modification would be necessary to remove the core support lugs. The licensee considers this impractical. Approximately 77.8% coverage was obtained for weld 2RPV-101-142A with no reportable indications noted.

Evaluation

The 1989 edition of the ASME Code, Section XI, Table IWB-2500-1, Code Category B-A, Item No. B1.12, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval. The examination volume is defined in Figure IWB-2500-2(b).

The NRC staff reviewed the data submitted by the licensee and concluded that the proximity of several core support lugs to the weld would limit ISI of portions of the weld. There were no recordable indications identified from the licensee's 77.8% coverage data. The NRC staff

concludes that the 77.8% of examination coverage obtained would have identified any pattern of degradation should one develop. Furthermore, a change of component design would be necessary to obtain the increased coverage. Requiring the licensee to remove the core support lugs to obtain the Code-required volumetric coverage would result in a significant burden; the examination coverage obtained provides reasonable assurance of the structural integrity of the weld.

Based on the above discussion, the NRC staff concludes that compliance with the Code-coverage requirement is impractical. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the second ISI interval for 2RPV-101-142A, for CNS2. 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 giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

RR 05-CN-003 (7) Examination Limitations For Lower Shell Long Seam Weld 2RPV-101-142B

Code Requirements for which Relief is Requested

As stated by the licensee, the 1989 edition of ASME Code, Section XI, Figure IWB-2500-2(b), Code Category B-A, Item No. B1.12, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval.

Component for Which Relief is Requested

Lower shell long seam weld 2RPV-101-142B at 180 degrees azimuth.

Licensee's Proposed Alternative to Code

No alternative offered by the licensee.

Licensee's Basis for Relief

The licensee stated that the subject weld, 2RPV-101-142B, configuration is such that the examination coverage is limited by physical interferences from the core support lugs which prevented scanning 100% of the weld length from four orthogonal directions. Pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), the licensee seeks relief from performing the 100% volumetric examination requirements of the ASME Code. In order to gain access to these welds to obtain 100% coverage, a design modification would be necessary to remove the core support lugs which the licensee considers impractical. Approximately 77.8% coverage was obtained for weld 2RPV-101-142B with no reportable indications noted.

Evaluation

The 1989 edition of the ASME Code, Section XI, Table IWB-2500-1, Code Category B-A, Item No. B1.12, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval. The examination volume is defined in Figure IWB-2500-2(b).

The NRC staff reviewed the data submitted by the licensee and concluded that the proximity of several core support lugs to the weld would limit ISI of portions of the weld. There were no recordable indications identified from the licensee's 77.8% coverage data. The NRC staff concludes that the 77.8% of examination coverage obtained would have identified any pattern of degradation should one develop. Furthermore, a change of component design would be necessary to obtain the increased coverage. Requiring the licensee to remove the core support lugs to obtain the Code-required volumetric coverage would result in a significant burden; the examination coverage obtained provides reasonable assurance of the structural integrity of the weld.

Based on the above discussion, the NRC staff concludes that compliance with the Code-coverage requirement is impractical. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the second ISI interval for 2RPV-101-142B, for CNS2. This grant of 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 giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

RR 05-CN-003 (8) EXAMINATION LIMITATIONS FOR LOWER SHELL LONG SEAM WELD 2RPV-101-142C

Code Requirements for which Relief is Requested

As stated by the licensee, the 1989 edition of ASME Code, Section XI, Figure IWB-2500-2(b), Code Category B-A, Item No. B1.12, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval.

Component for Which Relief is Requested

Lower shell long seam weld 2RPV-101-142C at 300 degrees azimuth.

Licensee's Proposed Alternative to Code

No alternative offered by the licensee.

Licensee's Basis for Relief

The licensee stated that the subject weld, 2RPV-101-142C, configuration is such that the examination coverage is limited by physical interferences from the core support lugs which

prevented scanning 100% of the weld length from four orthogonal directions. Pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), the licensee seeks relief from performing the 100% volumetric examination requirements of the ASME Code. In order to gain access to these welds to obtain 100% coverage, a design modification would be necessary to remove the core support lugs which the licensee considers impractical. Approximately 77.8% coverage was obtained for weld 2RPV-101-142C with one ASME Code allowable indication reported.

Evaluation

The 1989 edition of the ASME Code, Section XI, Table IWB-2500-1, Code Category B-A, Item No. B1.12, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval. The examination volume is defined in Figure IWB-2500-2(b).

The NRC staff reviewed the data submitted by the licensee and concluded that the proximity of several core support lugs to the weld would limit ISI of portions of the weld. There was one recordable indication identified with the amount of coverage obtained, and that the indication was allowable by the ASME Code. The NRC staff concludes that the 77.8% of examination coverage obtained would have identified any pattern of degradation should one develop. Furthermore, a change of component design would be necessary to obtain the increased coverage. Requiring the licensee to remove the core support lugs to obtain the Code-required volumetric coverage would result in a significant burden; the examination coverage obtained provides reasonable assurance of the structural integrity of the weld.

Based on the above discussion, the NRC staff concludes that compliance with the Code-coverage requirement is impractical. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the second ISI interval for 2RPV-101-142C, for CNS2. 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 giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

RR 05-CN-003 (9) Examination Limitations For Reactor Vessel Shell To Lower Head Circumferential Weld 2-RPV-101-151

Code Requirements for which Relief is Requested

As stated by the licensee, the 1989 edition of ASME Code, Section XI, Figure IWB-2500-3, Code Category B-A, Item No. B1.21, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval.

Component for Which Relief is Requested

Circumferential weld 2RPV-101-151 at 180 degrees azimuth.

Licensee's Proposed Alternative to Code

No alternative offered by the licensee.

Licensee's Basis for Relief

The licensee stated that the subject weld, 2RPV-101-151, configuration is such that the examination coverage is limited by proximity of the bottom mounted instrument tubes, which prevented scanning 100% of the weld length from four orthogonal directions. Pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), the licensee seeks relief from performing the 100% volumetric examination requirements of the ASME Code. In order to gain access to these welds to obtain 100% coverage, a design modification would be necessary to remove the bottom mounted instrumentation tubes which the licensee considers impractical. Approximately 53.3% coverage was obtained for weld 2RPV-101-151 with no reportable indications noted.

Evaluation

The 1989 edition of the ASME Code, Section XI, Table IWB-2500-1, Code Category B-A, Item No. B1.12, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval. The examination volume is defined in Figure IWB-2500-3(b).

The NRC staff reviewed the data submitted by the licensee and concluded that the proximity of several bottom mounted instrument tubes to the weld would limit ISI of portions of the weld. There were no recordable indications identified from the licensee's 53.3% coverage data. The NRC staff concludes that the 53.3% of examination coverage obtained would have identified any pattern of degradation should one develop. Furthermore, a change of component design would be necessary to obtain the increased coverage. Requiring the licensee to remove the bottom mounted instrumentation tubes to obtain the Code-required volumetric coverage would result in a significant burden; the examination coverage obtained provides reasonable assurance of the structural integrity of the weld.

Based on the above discussion, the NRC staff concludes that compliance with the Code-coverage requirement is impractical. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the second ISI interval for 2RPV-101-151, for CNS2. 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 giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

RR 05-CN-003 (10, 11 AND 12) Examination Limitations For Pressurizer Safety Nozzle To Upper Head Welds 2PZR-W3, -W4A, -W4B

Code Requirements for which Relief is Requested

As stated by the licensee, the 1989 edition of ASME Code, Section XI, Figure IWB-2500-7(b), Code Category B-D, Item No. B3.110, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval.

Component for Which Relief is Requested

Pressurizer safety nozzle to upper head welds 2PZR-W3, -W4A, -W4B.

Licensee's Proposed Alternative to Code

No alternative offered by the licensee.

Licensee's Basis for Relief

The licensee stated that the configuration of the subject welds, 2PZR-W3, -W4A, -W4B, is such that the examination coverage is limited by physical interferences from the nozzle geometry which prevents scanning 100% of the each nozzles' weld length from the nozzle side. Pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), the licensee seeks relief from performing the 100% volumetric examination requirements of the ASME Code. In order to gain access to these welds to obtain 100% coverage, the nozzles would have to be redesigned to allow scanning in four orthogonal directions, which the licensee considers impractical. Approximately 79.2% coverage was obtained for all three welds with no reportable indications noted.

Evaluation

The 1989 edition of the ASME Code, Section XI, Table IWB-2500-1, Code Category B-D, Item No. B3.110, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval. The examination volume is defined in Figure IWB-2500-7(b).

The NRC staff reviewed the data submitted by the licensee and concluded that the curvature of the nozzles directly adjacent to the weld would limit ISI of portions of the weld. There were no recordable indications identified from the licensee's 79.2% coverage data. The NRC staff concludes that the 79.2% of examination coverage obtained for each of the three nozzles would have identified any pattern of degradation should one develop. Furthermore, a change of component design would be necessary to obtain the increased coverage. Requiring the licensee to redesign the subject component to obtain the Code-required volumetric coverage would result in a significant burden; the examination coverage obtained provides reasonable assurance of the structural integrity of the weld.

Based on the above discussion, the NRC staff concludes that compliance with the Code-coverage requirement is impractical. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the second ISI interval for welds 2PZR-W3, -W4A, -W4B, for CNS2. 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 giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

RR 05-CN-003 (13) Examination Limitations For Steam Generator 2C Lower Shell To Transition Cone Weld 2SGC-04B-05

Code Requirements for which Relief is Requested

As stated by the licensee, the 1989 edition of ASME Code, Section XI, Figure IWC-2500-1(c), Code Category C-A, Item No. C1.10, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval.

Component for Which Relief is Requested

Steam generator 2C lower shell to transition cone weld 2SGC-04B-05.

Licensee's Proposed Alternative to Code

No alternative offered by the licensee.

Licensee's Basis for Relief

The licensee stated that the subject weld, 2SGC-04B-05, configuration is such that the examination coverage is limited by physical interferences from the proximity of nine restraint lugs which prevents scanning 100% of the weld length in four orthogonal directions. Pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), the licensee seeks relief from performing the 100% volumetric examination requirements of the ASME Code. In order to gain access to these welds to obtain 100% coverage, the component would have to be redesigned to allow scanning in four orthogonal directions, which the licensee considers impractical. Approximately 48.3% coverage was obtained for weld 2SGC-04B-05 with no reportable indications noted.

Evaluation

The 1989 edition of the ASME Code, Section XI, Table IWC-2500-1, Code Category C-A, Item No. C1.10, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval. The examination volume is defined in Figure IWC-2500-1(c).

The NRC staff reviewed the data submitted by the licensee and concluded that the restraint lugs' proximity adjacent to the subject weld, noted as "structural scan limitations," would limit ISI of portions of the weld. There were no recordable indications identified from the licensee's 48.3% coverage data. The NRC staff notes that the 48.3% of examination coverage is low, but is calculated based on an average of coverage obtained. The data from the licensee indicated scans in different directions as low as 41% coverage and as high as 87% coverage. The NRC staff concludes that the average examination coverage obtained would have identified any pattern of degradation should one develop. Furthermore, a change of component design to remove the nine restraint lugs would be necessary to obtain the increased coverage. Requiring the licensee to remove the nine restraint lugs to obtain the Code-required volumetric coverage

would result in a significant burden; the examination coverage obtained provides reasonable assurance of the structural integrity of the weld.

Based on the above discussion, the NRC staff concludes that compliance with the Code-coverage requirement is impractical. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the second ISI interval for 2SGC-04B-05, for CNS2. 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 giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

RR 05-CN-003 (14) Examination Limitations For Feedwater System Valve 2FW028 To Pipe Circumferential Weld 2FW76-6

Code Requirements for which Relief is Requested

As stated by the licensee, the 1989 edition of ASME Code, Section XI, Figure IWC-2500-7(a), Code Category C-F-1, Item No. C5.11, requires a surface and volumetric examination which includes 100% of the weld length, once during the 10-year interval.

Component for Which Relief is Requested

Feedwater system valve 2FW028 to pipe circumferential weld 2FW76-6.

Licensee's Proposed Alternative to Code

No alternative offered by the licensee.

Licensee's Basis for Relief

The licensee stated that the subject weld, 2FW76-6, configuration is such that the examination coverage is limited to single-sided access caused by the valve configuration, preventing scanning from the valve side of the weld. Pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), the licensee seeks relief from performing the 100% volumetric examination requirements of the ASME Code. In order to gain access to this weld to obtain 100% coverage, the weld would have to be re-designed to allow scanning in four orthogonal directions, which the licensee considers impractical. Approximately 30.8% coverage was obtained for weld 2FW76-6 with no reportable indications noted.

Evaluation

The 1989 edition of the ASME Code, Section XI, Table IWC-2500-1, Code Category C-F-1, Item No. C5.11, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval. The examination volume is defined in Figure IWC-2500-7(a).

The NRC staff reviewed the data submitted by the licensee and concluded that the close proximity of the valve to the subject weld would prevent a two-sided inspection of the weld. There were no recordable indications identified from the licensee's 30.8% coverage data. The NRC staff notes that the 30.8% of examination coverage is low, but is calculated based on an average of coverage obtained.

The data from the licensee indicated scans in different directions as low as 0% coverage and as high as 43% coverage. The licensee also completed a one-sided 70-degree shear scan (best effort), but did not include it in the coverage calculations due to the requirements of 10 CFR 50.55a(b)(2)(xv)(A)(2). The requirement states in part that full coverage can only be claimed for a single-sided examination in austenitic or dissimilar metal welds after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld. The NRC staff considers the completion of the 70-degree shear wave examination a best effort examination that indicates partial acceptability of the subject weld. The NRC staff concludes from the information provided by the licensee that the average coverage obtained would have identified any pattern of degradation should one develop and that a change of component design would be necessary to obtain the increased coverage. Requiring the licensee to redesign the weld would result in a significant burden; the examination coverage provides reasonable assurance of the structural integrity of the weld.

Based on the above discussion, the NRC staff considers it impractical to redesign the weld in order to obtain the Code-required volumetric coverage and that the examination coverage obtained provides reasonable assurance of the structural integrity of the weld.

Based on the above discussion, the NRC staff concludes that compliance with the Code-coverage requirement is impractical. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the second ISI interval for weld 2FW76-6, for CNS2. 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 giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

RR 05-CN-003 (15) Examination Limitations For Chemical and Volume Control System Elbow To Tee Circumferential Weld 2NV34-11

Code Requirements for which Relief is Requested

As stated by the licensee, the 1989 edition of ASME Code, Section XI, Figure IWC-2500-7(a), Code Category C-F-1, Item No. C5.21, requires a surface and volumetric examination which includes 100% of the weld length, once during the 10-year interval.

Component for Which Relief is Requested

Chemical and volume control system elbow to tee circumferential weld 2NV34-11.

Licensee's Proposed Alternative to Code

No alternative offered by the licensee.

Licensee's Basis for Relief

The licensee stated that the subject weld, 2NV34-11, configuration is such that the examination coverage is limited to single-sided access caused by the elbow to tee configuration, preventing scanning from the valve side of the weld. Pursuant to the requirements of 10 CFR 50.55a(g)(5)(iii), the licensee seeks relief from performing the 100% volumetric examination requirements of the ASME Code. In order to gain access to this weld to obtain 100% coverage, the weld would have to be redesigned to allow scanning in four orthogonal directions, which the licensee considers impractical. Approximately 85.8% coverage was obtained for weld 2NV34-11 with no reportable indications noted.

Evaluation

The 1989 edition of the ASME Code, Section XI, Table IWC-2500-1, Code Category C-F-1, Item No. C5.21, requires a volumetric examination which includes 100% of the weld length, once during the 10-year interval. The examination volume is defined in Figure IWC-2500-7(a).

The NRC staff reviewed the data submitted by the licensee and concluded that the close proximity of the subject weld to a tee would prevent two-sided examination. The licensee also completed a one-sided 70-degree shear scan (best effort), but did not include it in the coverage calculations due to the requirements of 10 CFR 50.55a(b)(2)(xv)(A)(2). The requirement states, in part, that full coverage can only be claimed for a single-sided examination in austenitic or dissimilar metal welds after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld. The NRC staff considers the completion of the 70-degree shear wave examination a best effort examination that indicates partial acceptability of the subject weld. The NRC staff concludes from the information provided by the licensee that the coverage obtained would have identified any pattern of degradation should one develop and that a change of component design would be necessary to obtain the increased coverage.

Based on the above discussion, the NRC staff considers it impractical to redesign the weld in order to obtain the Code-required volumetric coverage and that the examination coverage obtained provides reasonable assurance of the structural integrity of the weld.

Based on the above discussion, the NRC staff concludes that compliance with the Code-coverage requirement is impractical. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the second ISI interval for weld 2NV34-11, for CNS2. 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 giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

4.0 CONCLUSION

The NRC staff concludes that ultrasonic examination to the extent required by the Code is impractical for the welds identified in the licensee's submittal. The NRC staff further concludes that reasonable assurance of structural integrity is provided by the alternative examinations that were, and will be, performed by the licensee. Therefore, relief is granted and alternative examinations are imposed pursuant to 10 CFR 50.55a(g)(6)(i) for the second 10-year ISI interval at Catawba, Unit 2. The relief granted and alternative examinations imposed are authorized by law and will not endanger life, property, or the common defense and security, and is 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. All other requirements of the ASME Code, Section XI for which relief has not been specifically requested and approved remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: T. K. Steingass

Date: