Duke Energy®

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July 11, 2007

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Subject: Duke Power Company LLC d/b/a Duke Energy Carolinas, LLC (Duke)
Catawba Nuclear Station, Unit 2
Docket Number 50-414
Request for Relief Numbers 07-CN-001 and 07-CN-002
Limited Weld Examinations During the End-of-Cycle 14 Refueling Outage

Pursuant to 10 CFR 50.55a(g)(5)(iii), please find attached Requests for Relief 07-CN-001 and 07-CN-002. These requests for relief are associated with limited weld examinations during inservice inspection activities for the subject refueling outage. During this outage, inservice inspection activities were conducted for the third period of the second inspection interval (Request for Relief 07-CN-001) and for the first period of the third inspection interval (Request for Relief 07-CN-002). Both requests for relief are being submitted together, since the inservice inspection activities for both periods/intervals occurred during the same refueling outage.

The attachments to this letter contain all technical information necessary in support of these requests for relief. Duke is requesting NRC review and approval of these requests at your earliest convenience.

There are no regulatory commitments contained in this letter or its attachments.

If you have any questions concerning this material, please call L.J. Rudy at (803) 831-3084.

Rec'd 9/20/07

A047
NRR

Very truly yours,

James R. Morris

LJR/s

Attachments

xc (with attachments):

W.D. Travers, Regional Administrator
U.S. Nuclear Regulatory Commission, Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, GA 30303

A.T. Sabisch, Senior Resident Inspector
U.S. Nuclear Regulatory Commission
Catawba Nuclear Station

J.F. Stang, Jr., Senior Project Manager (addressee only)
U.S. Nuclear Regulatory Commission
Mail Stop 8-H4A
Washington, D.C. 20555-0001

bxc (with attachments):

R.D. Hart
L.J. Rudy
K.E. Nicholson
M.A. Pyne
A.J. Hogge, Jr.
R.N. McGill
RGC File
Document Control File 801.01
ELL-EC050
NCMPA-1
NCEMC
PMPA
SREC

Attachment 1

Request for Relief 07-CN-001

Relief Request 07-CN-001

Proposed Relief in Accordance with 10 CFR 50.55a (g)(5)(iii)

Inservice Inspection Impracticality

Duke Energy Corporation

Catawba Nuclear Station – Unit 2 (EOC-14)

Second 10-Year Interval – Inservice Inspection Plan

Interval Start Date = 8-19-96 Interval End Date = 8-19-06

This Relief Request has two (2) welds for which relief is being sought.

The ID's and Item / Summary Numbers for the two (2) welds are as follows:

List Number	Weld ID	Item / Summary Number
1.	2ND-37A	B12.040.002B
2.	2ND24-16	C05.011.077

Attachment A contains the inspection data for Weld ID. 2ND-37A.
Attachment B contains the inspection data for Weld ID. 2ND24-16.

Items in this relief request were examined during March/April of 2006.

I. ASME Code Component Affected

Weld ID = 2ND-37A
Item / Summary Number = B12.040.002B
Residual Heat Removal System
Valve 2ND37A Body to Bonnet Weld

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1989 Edition No Addenda
Code Case N-460 is applicable

III. Applicable Code Requirement

Table IWB-2500-1, Examination Category B-M-1
Item / Summary Number B12.40.
Appendix III, III-4420 and III-4430
Figure IWB-2500-17, 100% Volume Coverage of Examination Volume J-K-L-M
Code Case N-460, Greater than 90% Volume Coverage of Examination Volume J-K-L-M

IV. & V. Impracticality/Burden Caused by Code Compliance

The valve body to bonnet material is wrought stainless steel. This weld has a diameter of 20.0 inches and a wall thickness of 2.43 inches. During the ultrasonic examination 70.825% coverage of the required examination volume was obtained. The percentage of coverage reported represents the aggregate coverage from all scans performed on the weld and adjacent base material. ASME Section XI, Appendix III, III-4420 requires coverage of the examination volume in two beam path directions and Appendix III, III-4430 requires scanning on the weld crown and base material in two directions. These requirements could not be met because of the weld configuration. As shown on Attachment A, Page 5 of 8, the proximity of the machined radius on the valve bonnet prevented scanning on the bonnet side of the weld. The coverage from each scan was as follows: 45° scan parallel to the weld covered 75.30% in two beam directions; combinations of 45° and 60° shear and refracted longitudinal wave scans perpendicular to the weld covered, 37.10% from the valve bonnet side and 95.60% from the valve body side. All scans were performed using a one half V-path technique. Two beam path direction coverage is normally obtained using one half V-path shear waves from both sides of the weld or, alternatively, full V-path shear waves from one side of the weld. However, the weld joint geometry prevented scanning from both sides of the weld in two beam path directions and a full V-path examination from one side is prevented because of the stainless steel weld metal properties which cause excessive attenuation with shear waves. Substituting full V-path refracted longitudinal waves for shear waves are not possible because of the mode conversion occurring at the inside surface when using refracted longitudinal waves. In order to meet the coverage requirements for this weld, the weld joint would have to be redesigned to allow more scanning area, which is impractical. There were no recordable indications found during the inspection of this weld.

(Examination Data is shown in Attachment A)

VI. Alternate Examinations or Testing

Radiography as an alternative would require disassembly of the valve, which is impractical; therefore, no alternate examination or testing for the weld was performed during the Second Ten Year Inspection Interval.

VII. Implementation Schedule and Duration

No additional examination for the weld was performed during the Second Ten Year Inspection Interval.

VIII. Justification for Granting Relief

Ultrasonic examination of the weld for Item Number B12.040.002B was conducted using personnel qualified in accordance with ASME Section XI, Appendix VII of the 1989 Edition, No Addenda. The ultrasonic procedures used complied with the requirements of ASME Section XI, Appendix III, 1989 Edition, No Addenda. Based on the following justification, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity.

The piping containing valve 2ND37A is an ASME III, Class 1 line with a design temperature of 650°F and a design pressure of 2500 psia. The valve is located inside the Unit 2 containment. The subject weld is associated with a 12" Borg Warner, 1512 lb. gate valve. This secondary boundary isolation valve remains closed during normal operation to isolate the low pressure residual heat removal system from the high pressure reactor coolant system (i.e., Reactor Coolant Pressure Isolation Valves). The valve is opened during plant startup and shutdown to provide core cooling.

The subject weld is between the SA182 F316 valve body and the SA182 F316 bonnet neck. These materials are austenitic (16Cr-12Ni-2Mo) based materials and a) have a high corrosion resistance with low contribution of corrosion products to the coolant, b) have good mechanical properties and c) are highly weldable. Very few service induced problems with stainless steel in PWR primary system applications have been observed in operating plants. There has been limited susceptibility to stress corrosion cracking due to chloride contamination and cracking in stagnant borated systems. Chemistry limits on chlorides, fluorides and sulfides and dissolved oxygen are controlled by Selected Licensee Commitment (SLC) and other administrative procedures at Catawba to ensure that any favorable conditions for SCC are precluded. Additionally, controls on welding filler material consistent with Regulatory Guide 1.31 also have served to limit the susceptibility of these welds to SCC. No other known degradation

mechanisms are applicable to this material at this particular location within the system.

This piping and valve body are normally covered by metal reflective insulation. During each refueling outage, multiple walkdowns of containment are performed to determine the presence of external leakage. These walkdowns include a boric acid walkdown (PT/2/A/4150/001H) while the primary system remains at temperature and pressure (Mode 3). Other walkdowns performed during the outage are system engineer walkdowns (PEP 3.09), operation walkdowns at 350 psi, 1000 psi and normal operation pressure (OP/2/A/6100/001) and the ASME XI, IWA-5000, system leakage test. During these various walkdowns, any leakage from this weld would be recognized by active leakage or boron deposit buildups around the valve and mirror insulation.

In addition, leakage during operation (assuming leakby of the primary isolation valve) at the body to bonnet weld 2ND37A would be detected by various other leakage detection systems available to the operator. These systems identified with plant technical specifications include:

a) Containment Atmosphere Particulate Radioactivity (EMF 38) Monitor which would detect airborne radiological activity;

b) Containment Ventilation Unit Condensate Drain Tank Level Monitor which collects and measures as unidentified leakage the moisture removed from the containment atmosphere;

c) Containment Floor and Equipment Sump Level Monitors where unidentified accumulated water on the containment floor would be monitored and evaluated as sump level changes.

d) A reactor coolant system water inventory balance is performed on a regular basis (i.e. at least once every three days). The normal operating practice is to perform this computer based program on a daily frequency and/or whenever the operators suspect any abnormal changes to other leakage detection systems. A Plant Technical Specification requires system leakage from "unidentified" sources be maintained below 1 gpm; however, plant operation procedure (PT/1(2)/A/4150/001D, NC System Leakage Calculation) establishes an administrative limit of 0.15 gpm above which the source of leakage will be investigated. Leakage as a result of a leak in the weld discussed in this section would show up as unidentified leakage and subject to the 0.15 gpm administrative limit.

Other leakage detection systems available to the operator include 1) Volume Control Tank (VCT) level changes, 2) VCT make-up frequencies and 3) Cold Leg Accumulator level changes.

These walkdowns and leakage detection systems provide a high level of confidence that any leakage would be promptly identified at this welded joint inside containment.

References:

1) Weld Isometric CN-2ND-066
2) Piping Isometric CN-2491-ND001
3) Flow Diagram CN-2561-1.1
4) Valve Drawing for 2ND37A, CNM-1205.00-0262
5) Technical Specification 3.4.13, RCS Operational Leakage
6) Technical Specification 3.4.15, RCS Leakage Detection Instrumentation

I. ASME Code Component Affected

Weld ID = 2ND24-16
Item / Summary Number = C05.011.077
Residual Heat Removal System
Pipe to Flange Weld

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1989 Edition No Addenda
Code Case N-460 is applicable

III. Applicable Code Requirement

Table IWC-2500-1, Examination Category C-F-1
Item / Summary Number C5.11
Figure IWC-2500-7(a), 100% Volume Coverage of Examination
Volume C-D-E-F
Code Case N-460, Greater than 90% Volume Coverage of Examination
Volume C-D-E-F

IV. & V. Impracticality/Burden Caused by Code Compliance

The flange and pipe material are wrought stainless steel. This weld has a diameter of 12.00 inches and a wall thickness of 0.375 inch. During the ultrasonic examination of this weld, 62.50% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 100% of the weld and base material; 60° shear wave scan from the pipe side perpendicular to the weld covered 50% of the weld and base material. A supplemental scan using a 70° shear wave search unit covered 50% of the examination volume on the flange side from one direction perpendicular to the weld but is not included in the coverage calculations because of the requirements of 10CFR50.55 a (b)(2)(xv)(A)(1) which mandates scanning from four directions. The limitation was caused by the taper on the flange side of the weld which does not provide enough scanning area from that side. In order to meet the coverage requirements for this weld, the weld joint would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

(Examination Data is shown in Attachment B)

VI. Alternate Examinations or Testing

No alternate examination or testing for the weld was performed during the Second Ten Year Inspection Interval.

VII. Implementation Schedule and Duration

No additional examination for the weld was performed during the Inspection Interval.

VIII. Justification for Granting Relief

Ultrasonic examination of the weld for item number C05.011.077 was conducted using personnel qualified in accordance with ASME Section XI, Appendix VII of the 1989 Edition, No Addenda. The ultrasonic procedures used complied with the requirements of ASME Section XI, Appendix III, 1989 Edition, No Addenda. In addition, a dye penetrant examination was performed on the weld in accordance with ASME Section XI, 1989 Edition , No Addenda. No recordable or reportable indications were found. Based on the following justification, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity.

Weld 2ND24-16 is a weld between 12" XS wall piping and a 12", 600 lb, raised face flange. The associated piping is located downstream of the Residual Heat Removal Heat Exchanger (NDHX) 2A on ASME Class 2 piping with a design temperature of 400°F and design pressure of 615 psia. This piping is located in the auxiliary building and is not normally pressurized during reactor operation. This weld maintains the pressure boundary as part of the ECCS flow path under accident conditions.

The subject weld is between the SA312 TP304 piping and a SA182 F304 flange. These materials are austenitic (18Cr-8Ni) based materials and a) have a high corrosion resistance with low contribution of corrosion products to the coolant, b) have good mechanical properties and c) are highly weldable. Very few service induced problems with stainless steel in PWR primary system applications have been observed in operating plants. There has been limited susceptibility to stress corrosion cracking due to chloride contamination and cracking in stagnant borated systems. Chemistry limits on chlorides, fluorides and sulfides are controlled by Selected Licensee Commitment (SLC) and other administrative procedures at Catawba to ensure that any favorable conditions for SCC are precluded. Additionally, controls on welding filler material consistent with Regulatory Guide 1.31 also have served to limit the susceptibility of these welds to SCC. No other known degradation mechanisms are applicable to this material at this particular location within the system.

This piping and flange are normally covered by calcium silicate insulation. This piping is in the Unit 2 mechanical penetration room of the auxiliary building. Leakage during normal operation would be seen as active leakage due to ambient temperature conditions and readily identified on the 543 ft. floor elevation below. The room is accessible during normal operation and is within the scope of weekly operation walkdowns. Periodic system engineer walkdowns are also performed that include leakage identification on the ND system.

In addition to walkdowns, an operational leak rate test (PT/2/A/4202/002) for the ND system is performed with the system pressurized on an annual basis. An ASME XI, IWA-5000 system leakage test is also performed every ISI period. Either of these tests would identify leakage at this particular weld.

These walkdowns and leakage tests provide a high level of confidence that any leakage would be promptly identified at this welded joint in the Auxiliary Building mechanical penetration room. As a result, the limited volumetric coverage associated with this particular weld has no significant impact on the continued assurance of structural integrity for the ND piping.

References:

1) Weld Isometric CN-2ND-0024
2) Piping Isometric CN-2492-ND019
3) Flow Diagram CN-2561-1.0

IX. Other Information

The following individuals contributed to the development of this relief request:

James J. McArdle (Principal UT NDE Level III Examiner) provided Sections III, IV, V, VI, VII and part of Section VIII.

W.O. Callaway (Catawba Engineering) provided part of Section VIII.

Andy Hogge (Catawba ISI Plan Manager) compiled the remaining sections.

Request for Relief 07-CN-001

Attachment A

Weld 2ND - 37A

Number of Pages = 8

UT Vessel Examination

Site/Unit: Catawba / 2 | Procedure: NDE-3630 | Outage No.: CNS2-14

Summary No.: B12.040.002B | Procedure Rev.: 0 | Report No.: UT-06-162

Workscope: ISI | Work Order No.: 98732469 | Page: 1 of 8

Code: Asme Section XI 1989 | Cat./Item: B-M-1/B12.40.2B | Location:

Drawing No.: CN-2ND-66 | Description: Valve Body to Bonnet

System ID: ND

Component ID: B12.040.002B/2ND-37A | Size/Length: N/A | Thickness/Diameter: 2.430 / 20.0

Limitations: Yes-See Attached Limitation Report | Start Time: 0930 | Finish Time: 0955

Examination Surface: Inside ☐ Outside ☑ | Surface Condition: AS GROUND

Lo Location: RT INT. #1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 05125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32821 | Surface Temp.: 68 °F

Cal. Report No.: CAL-06-157, CAL-06-158, CAL-06-159, CAL-06-160

Angle Used	0	45	45T	60	60T	60L
Scanning dB		49	59	64		79

Indication(s): Yes ☐ No ☑ | Scan Coverage: Upstream ☑ Downstream ☑ CW ☑ CCW ☑

Comments:

FC 06-02

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No - 70.8 % | Reviewed Previous Data: Yes

Examiner	Level II	Signature	Date	Reviewer		Signature	Date
Leeper, Winfred C.		Winfred C. Leeper	4/1/2006				4-6-06
Examiner	Level II-N	Signature	Date	Site Review		Signature	Date
Busby, John S.		John S. Busby	4/1/2006	N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A							4-10-06

RFR 07-CN-001 ATTACHMENT A

AKH 5/3/06

Determination of Percent Coverage for UT Examinations - Vessels

Site/Unit:	Catawba / 2	Procedure:	NDE-3630	Outage No.:	CNS2-14
Summary No.:	B12.040.002B	Procedure Rev.:	0	Report No.:	UT-06-162
Workscope:	ISI	Work Order No.:	98732469	Page:	2 of 8

0 deg Planar

Scan _____ % Length X _____ % volume of length / 100 = _____ % total for 0 deg

45 deg

Scan 1 _____ % Length X _____ % volume of length / 100 = _____ % total for Scan 1

Scan 2 _____ % Length X _____ % volume of length / 100 = _____ % total for Scan 2

Scan 3 _____ % Length X _____ % volume of length / 100 = _____ % total for Scan 3

Scan 4 _____ % Length X _____ % volume of length / 100 = _____ % total for Scan 4

Add totals and divide by # scans = _____ **% total for 45 deg**

Other deg 45°/60°

Scan 1 100.000 % Length X 37.100 % volume of length / 100 = 37.100 % total for Scan 1

Scan 2 100.000 % Length X 95.600 % volume of length / 100 = 95.600 % total for Scan 2

Scan 3 100.000 % Length X 75.300 % volume of length / 100 = 75.300 % total for Scan 3

Scan 4 100.000 % Length X 75.300 % volume of length / 100 = 75.300 % total for Scan 4

Add totals and divide by # scans = 70.825 **% total for** 45°/60° **deg**

Percent complete coverage

Add totals for each angle and scan required and divide by # of angles to determine;

70.825 **% Total for complete exam**

Note:

Supplemental coverage may be achieved by use of other angles / methods. When used, the coverage for volume not obtained with angles as noted above shall be calculated and added to the total to provide the percent total for the complete examination.

Site Field Supervisor: _____ Date: 4/1/06

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: 2ND-37A **Item No:** B12.040.002B

remarks:

☐ NO SCAN SURFACE BEAM DIRECTION
☒ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw
FROM L N/A to L N/A INCHES FROM W0 -0.8 to Beyond
ANGLE: ☐ 0 ☒ 45 ☐ 60 other ____ FROM 0 DEG to 360 DEG

Valve Bonnett Configuration

☐ NO SCAN SURFACE BEAM DIRECTION
☒ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☐ cw ☐ ccw
FROM L N/A to L N/A INCHES FROM W0 +2.0 to +3.55
ANGLE: ☐ 0 ☐ 45 ☒ 60 other ____ FROM 0 DEG to 360 DEG

Valve Body Configuration

☐ NO SCAN SURFACE BEAM DIRECTION
☒ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☐ cw ☐ ccw
FROM L N/A to L N/A INCHES FROM W0 +2.0 to Beyond
ANGLE: ☐ 0 ☒ 45 ☐ 60 other ____ FROM 0 DEG to 360 DEG

Valve Body Configuration

☐ NO SCAN SURFACE BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L ____ to L ____ INCHES FROM W0 ____ to ____
ANGLE: ☐ 0 ☐ 45 ☐ 60 other ____ FROM ____ DEG to ____ DEG

Sketch(s) attached
☒ yes ☐ No

Prepared By: Jay Eaton Level: III Date: 04/01/2006 Sheet 3 of 8

Reviewed By: Gary A Moss Date: 4/6/06 Authorized Inspector: Robert D McLin Date: 4-10-06

DUKE POWER COMPANY

ISI LIMITATION REPORT

Component/Weld ID: 2ND-37A **Item No:** B12.040.002B

remarks: Valve Bonnett Configuration

☐ NO SCAN ☒ LIMITED SCAN — SURFACE: ☒ 1 ☐ 2 — BEAM DIRECTION: ☐ 1 ☒ 2 ☒ cw ☐ ccw

FROM L N/A to L N/A INCHES FROM **W0** -0.8 to Beyond

ANGLE: ☐ 0 ☒ 45 ☐ 60 other _____ FROM 0 DEG to 360 DEG

☐ NO SCAN ☐ LIMITED SCAN — SURFACE: ☐ 1 ☐ 2 — BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____ INCHES FROM **W0** _____ to _____

ANGLE: ☐ 0 ☐ 45 ☐ 60 other _____ FROM _____ DEG to _____ DEG

☐ NO SCAN ☒ LIMITED SCAN — SURFACE: ☐ 1 ☒ 2 — BEAM DIRECTION: ☒ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____ INCHES FROM **W0** _____ to _____

ANGLE: ☐ 0 ☐ 45 ☐ 60 other _____ FROM _____ DEG to _____ DEG

☐ NO SCAN ☐ LIMITED SCAN — SURFACE: ☐ 1 ☐ 2 — BEAM DIRECTION: ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____ INCHES FROM **W0** _____ to _____

ANGLE: ☐ 0 ☐ 45 ☐ 60 other _____ FROM _____ DEG to _____ DEG

Sketch(s) attached ☒ yes ☐ No

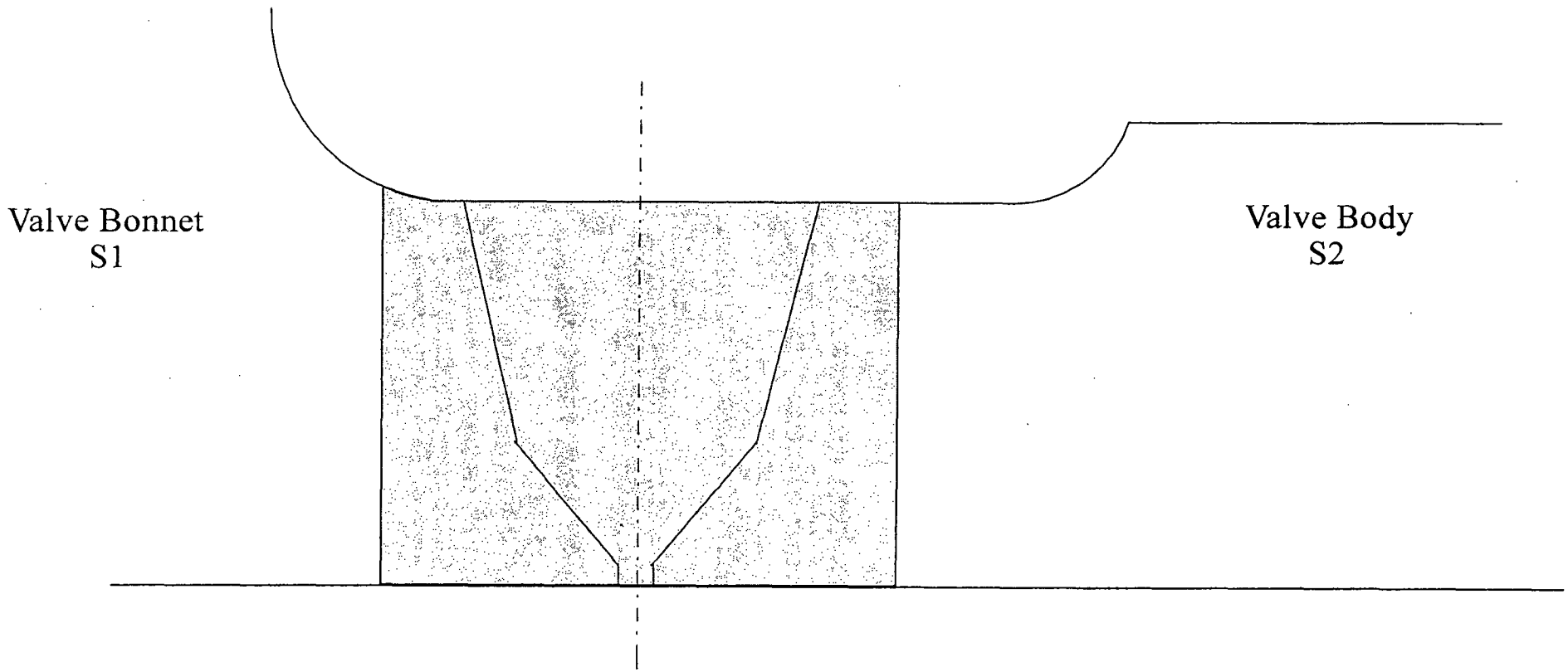
Prepared By: Jay Eaton Level: III Date: 04/01/2006 Sheet 4 of 8

Reviewed By: Date: 4/6/06 Authorized Inspector: Date: 4-10-06

Item No: B12.040.002B

Weld No: 2ND-37A

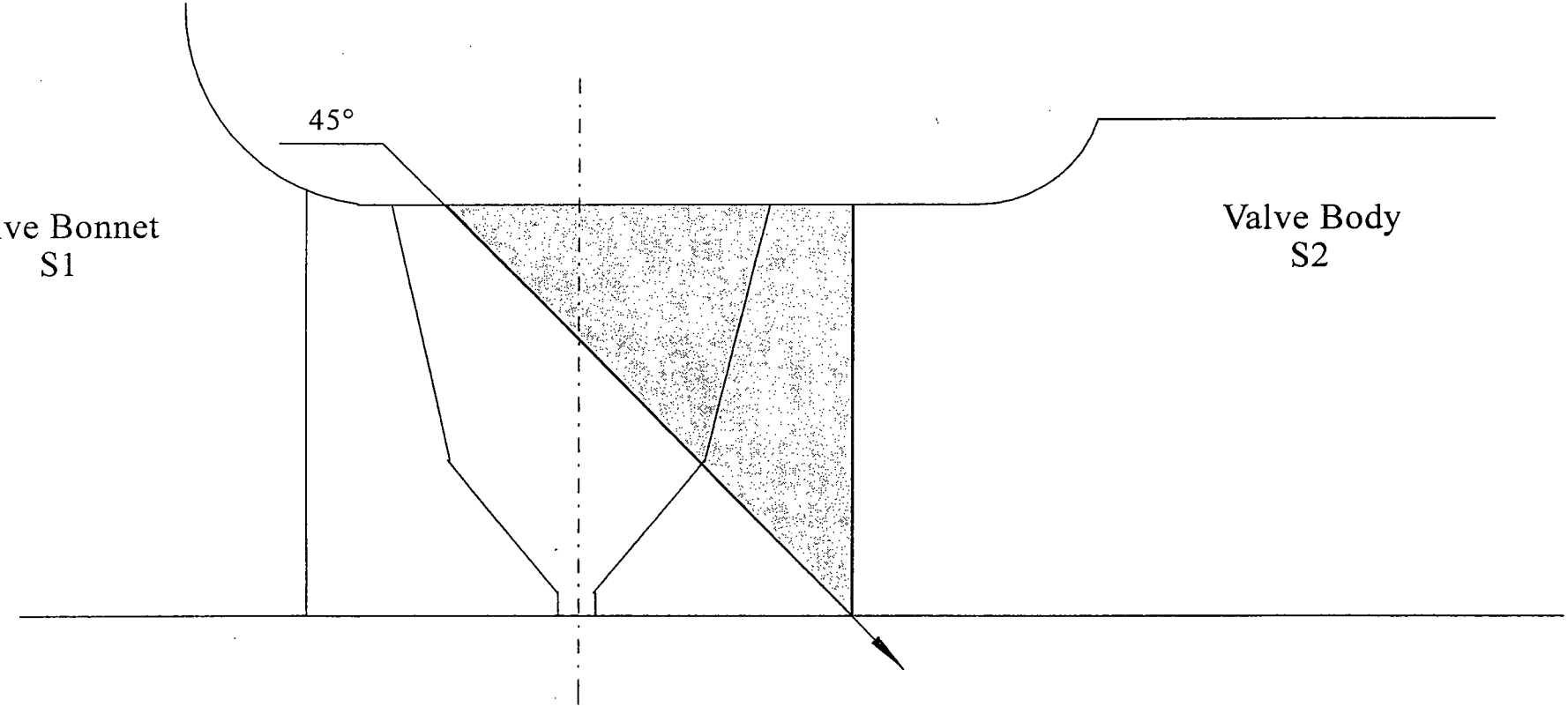
Total Exam Area = 7.69 sq. in.



Inspector / Date: _____ III

45° Axial Scan coverage from S1 = 2.85 sq. in.

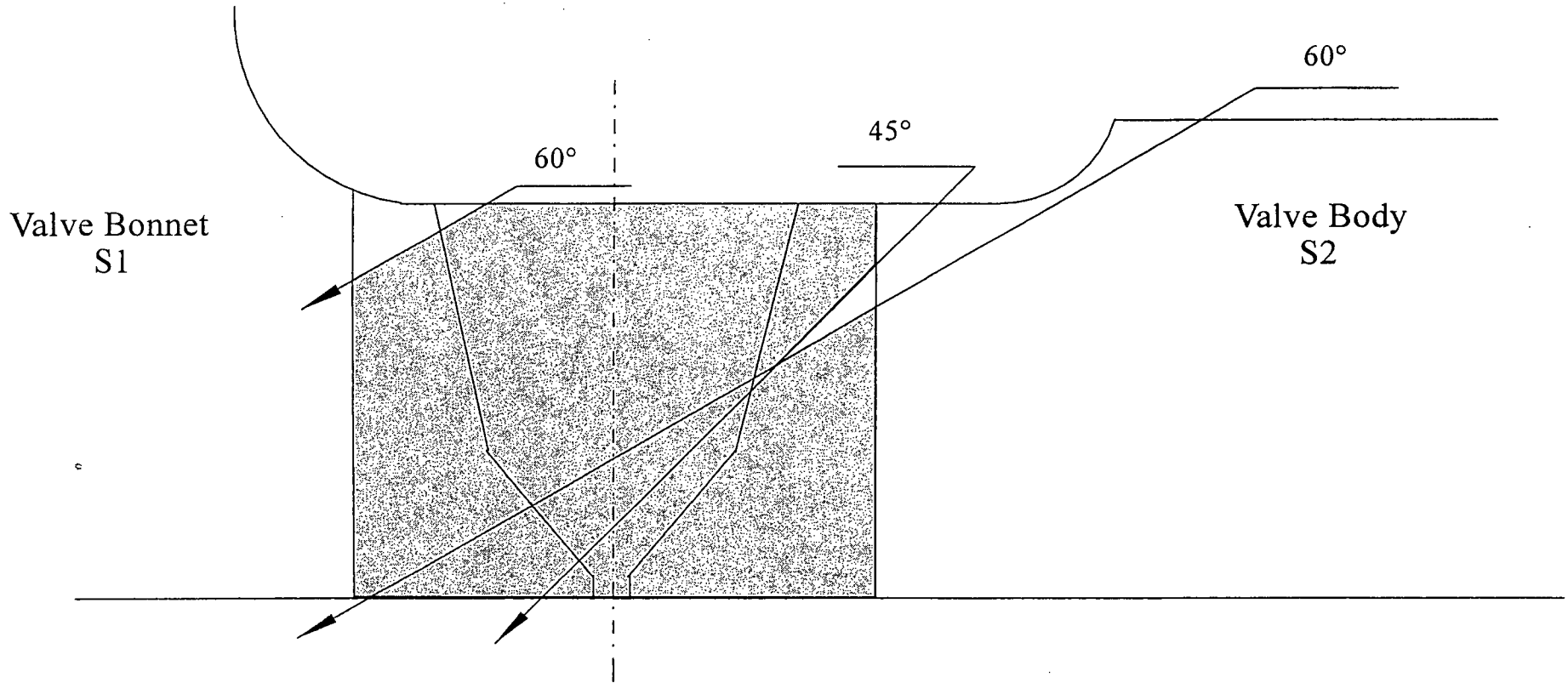
% Coverage = 2.85 / 7.69 x 100 = 37.1%



Inspector / Date: _____ III

Combination of 45° & 60° Axial Scan coverage from S2 = 7.35 sq. in.

% Coverage = 7.35 / 7.69 x 100 = 95.6%



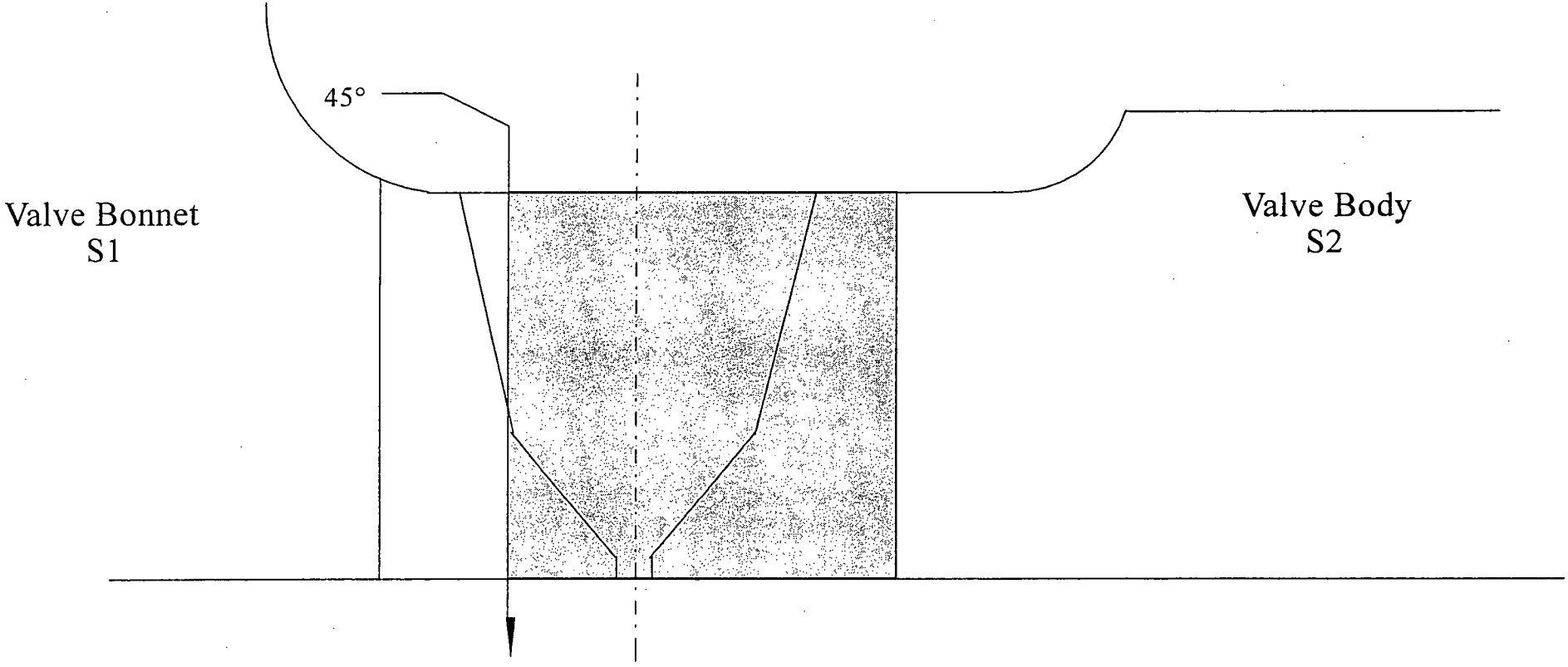
Inspector / Date: JH 4/1/06

Item No: B12.040.002B

Weld No: 2ND-37A

45° Circ. Scan coverage S3 & S4 = 5.79 sq. in.

% Coverage = 5.79 / 7.69 x 100 = 75.3%



Inspector / Date: III 4/1/06

Request for Relief 07-CN-001

Attachment B

Weld 2ND24 - 16

Number of Pages = 2

UT Pipe Weld Examination

Duke Energy

Site/Unit: Catawba / 2 | Procedure: NDE-600 | Outage No.: CNS2-14

Summary No.: C05.011.077 | Procedure Rev.: 16 | Report No.: UT-06-061

Workscope: ISI | Work Order No.: 98761111 | Page: 1 of 2

Code: Asme Section XI 1989 | Cat./Item: C-F-1/C5.11.77 | Location:

Drawing No.: CN-2ND-24 | Description: Pipe to Flange

System ID: ND

Component ID: C05.011.077 /2ND24-16 | Size/Length: N/A | Thickness/Diameter: .375 / 12.0

Limitations: Yes-See Attached Limitation Report | Start Time: 1022 | Finish Time: 1036

Examination Surface: Inside ☐ Outside ☑ | Surface Condition: AS GROUND

Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 03125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32821 | Surface Temp.: 80 °F

Cal. Report No.: CAL-06-082, CAL-06-083, CAL-06-084

Angle Used	0	45	45T	60	70	
Scanning dB			40	48	49	

Indication(s): Yes ☐ No ☑ | Scan Coverage: Upstream ☑ Downstream ☐ CW ☑ CCW ☑

Comments:

FC 05-08

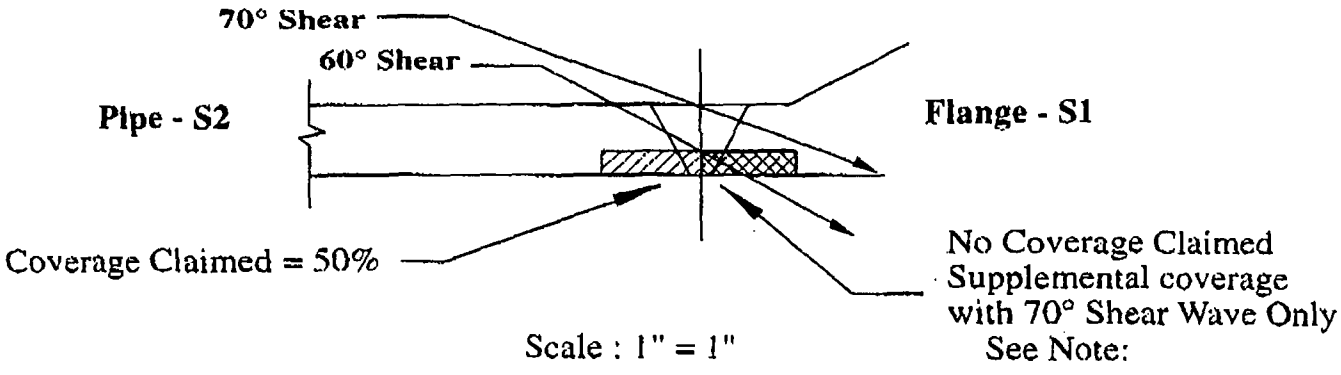
Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-62.5% | Reviewed Previous Data: Yes

Examiner Leeper, Winfred C.	Level II	Signature Winfred Leeper	Date 3/15/2006	Reviewer		Signature M E Hansen	Date 3.29.06
Examiner Griebel, David M.	Level II-N	Signature	Date 3/15/2006	Site Review N/A		Signature	Date
Other N/A	Level N/A	Signature	Date	ANII Review		Signature Nancy C Ritchie Slaughter	Date 3/30/06

RFR 07-CN-001 ATTACHMENT B

MS 5/9/06



Note: 70° shear scan not included in percentage coverage due to requirements of 10CFR50.55a(b)(2)(xv)(A)(1). Best effort scan with 70 shear obtained 50% coverage in one axial direction.

No scan with the 60° shear from the Surface 1 side of the weld due to flange configuration. Limited 0° to 360° from the weld C/L + 0.85" and beyond.

Pipe Ø = **12.75** **Flange = Surface 1** **Pipe = Surface 2**

"t" = **0.375** **Total Exam Volume**

1/3 "t" = **0.13** = (Weld + 1/4" ea. Side) x 1/3 "t" x Weld Length

Weld Length = **40.1** = **5.21** in ^{3}

Weld + 1/4" ea. Side = **1.00**

Aggregate Coverage Calculation

S1 = Flange	**0 %**	(0% of the Length x 0% of the Volume)
S2 = Pipe	**50 %**	(100% of the Length x 50% of the Volume)
S3 = CW	**100 %**	(100% of the Length x 100% of the Volume)
S4 = CCW	**100 %**	(100% of the Length x 100% of the Volume)

Total = 250 ÷ 4 = 62.5% Aggregate Coverage

Inspector / Date: JL 3/20/06

Report No. UT-06-061

Attachment 2

Request for Relief 07-CN-002

Relief Request 07-CN-002

Proposed Relief in Accordance with 10 CFR 50.55a(g)(5)(iii)

Inservice Inspection Impracticality

Duke Energy Corporation

Catawba Nuclear Station – Unit 2 (EOC-14)

Third 10-Year Interval – Inservice Inspection Plan

Interval Start Date = 10-15-2005 Interval End Date = 8-19-2016

This Relief Request has three (3) welds for which relief is being sought.

The ID's and Item / Summary Numbers for the three (3) welds are as follows:

List Number	Weld ID	Item / Summary Numbers
1.	2NI55-11	B09.011.165
2.	2NI55-8	B09.011.171
3.	2NV12-10	C05.021.209

Attachment A contains the inspection data for Weld ID 2NI55-11.
Attachment B contains the inspection data for Weld ID 2NI55-8.
Attachment C contains the inspection data for Weld ID 2NV12-10.

Items in this relief request were examined during March, 2006.

I. ASME Code Component Affected

Weld ID = 2NI55-11
Item / Summary Number = B09.011.165
Safety Injection System (NI)
NI System Valve 2NI081 to Pipe Circumferential Weld

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1998 Edition thru the 2000 Addenda
Code Case N-460 is applicable

III. Applicable Code Requirement

Table IWB-2500-1, Examination Category B-J
Item / Summary Number B9.11
Figure IWB-2500-8 (c), 100% Volume Coverage of Examination Volume C-D-E-F
Code Case N-460, Greater than 90% Volume Coverage of Examination Volume C-D-E-F

IV. & V. Impracticality/Burden Caused by Code Compliance

The valve and pipe material is stainless steel. This weld has a diameter of 10.75 inches and a wall thickness of 1.0 inch. During the ultrasonic examination of this weld, 37.50% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 50% of the weld and base material; 60° shear wave scan from the pipe side perpendicular to the weld covered 50% of the weld and base material. In accordance with Duke Energy Procedure NDE-91, scan areas S1 and S2 are defined as scans perpendicular to the weld and scan areas S3 and S4 are the clockwise and counter-clockwise scans parallel to the weld. A supplemental scan using a 60° refracted longitudinal wave search unit covered 50% of the examination volume on the valve side from one direction perpendicular to the weld but is not included in the coverage calculations because of the requirements of 10CFR50.55 a (b)(2)(xv)(A)(1) which mandates scanning from four directions. The limitation was caused by the taper on the valve side of the weld which did not allow placement of the search unit on that side of the weld. In order to scan all of the required volume for this weld, the valve would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

(Examination Data is shown in Attachment A)

VI. Alternate Examinations or Testing

No alternative examinations or testing for the scheduled weld inspection were performed.

VII. Implementation Schedule and Duration

No alternative examinations are planned for the weld during the current inspection interval.

VIII. Justification for Granting Relief

Ultrasonic examination of the weld for Item / Summary Number B09.011.165 was conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII. The ultrasonic procedures and equipment complied with the requirements of ASME Section XI, Appendix VIII as administered by the Performance Demonstration Initiative

(PDI), 1998 Edition through the 2000 Addenda. In addition, a dye penetrant examination was performed on the weld in accordance with the ASME Section XI. No recordable or reportable indications were found. Based on the following justification, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity assurance.

The piping containing weld 2NI55-11 is an ASME III, Class 1 line with a design temperature of 650°F and a design pressure of 2500 psia. The weld is located inside the Unit 2 Containment. The piping line connects the cold leg accumulator 2C to the reactor coolant system and also ties the residual heat removal (RHR) pump discharge header back to the reactor coolant loop (RCL) cold leg 2C. As such, the primary function of this piping is to serve as part of the flow path that a) supplies emergency core cooling system (ECCS) injection from the NI and RHR systems to the RCL during accident conditions and b) provides core decay heat removal during shutdown / startup operations. This line is normally stagnant during normal plant operation.

Weld 2NI55-11 is a circumferential butt weld just upstream of valve 2NI81. The weld is between valve 2NI81 and a section of 10", schedule 140 pipe. The valve body material is SA182 F316 and the attached piping is SA376 TP316.

These materials are austenitic (16Cr-12Ni-2Mo for TP316 and F316), base materials and a) have a high corrosion resistance with low contribution of corrosion products to the coolant, b) have good mechanical properties and c) are highly weldable. Very few service induced problems with stainless steel in pressurized water reactor (PWR) primary system applications have been observed in operating plants. There has been limited susceptibility to stress corrosion cracking (SCC) due to chloride contamination and cracking in stagnant borated systems. Chemistry limits on chlorides, fluorides and sulfides and dissolved oxygen are controlled by Selected Licensee Commitment (SLC) and other administrative procedures at Catawba to ensure that any favorable conditions for SCC are precluded. Additionally, controls on welding filler material consistent with Regulatory Guide 1.31 also have served to limit the susceptibility of these welds to SCC. No other known degradation mechanisms are applicable to this material at this particular location within the system.

This piping is not insulated. During each refueling outage, multiple walkdowns of containment are performed to determine the presence of external leakage. These walkdowns include a boric acid walkdown (PT/2/A/4150/001H) while the primary system remains at temperature and pressure (Mode 3). Other walkdowns performed during the outage are system engineer walkdowns (PEP 3.09), operation walkdowns at 350 psi, 1000 psi and normal operation pressure (OP/2/A/6100/001) and the ASME XI, IWA 5000, system leakage test. During these various walkdowns, any leakage from this weld would be recognized by active leakage or boron deposit buildups around the valve and piping.

In addition, leakage during operation at the weld location would be detected by various leakage detection systems available to the operator. The primary detection method at this location is the Containment Floor and Equipment Sump Level Monitors where unidentified accumulated water on the containment floor would be monitored and

evaluated as sump level changes. Leakage would also be promptly identified through a continuous decline in the Cold Leg Accumulator level.

These walkdowns and leakage detection systems provide a high level of confidence that any leakage would be promptly identified at this welded joint inside containment. As a result, the limited volumetric coverage associated with this particular weld has no significant impact on the continued assurance of structural integrity of the piping.

References:

1) Weld Isometric CN-2NI-055
2) Piping Isometric CN-2491-NI115
3) Flow Diagram CN-2562-1.1

I. ASME Code Component Affected

Weld ID = 2NI55-8
Item / Summary Number = B09.011.171
Safety Injection System (NI)
NI System Pipe to Tee Circumferential Weld

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1998 Edition thru the 2000 Addenda
Code Case N-460 is applicable

III. Applicable Code Requirement

Table IWB-2500-1, Examination Category B-J
Item / Summary Number B9.11
Figure IWB-2500-8 (c), 100% Volume Coverage of Examination Volume C-D-E-F
Code Case N-460, Greater than 90% Volume Coverage of Examination Volume C-D-E-F

IV. & V. Impracticality/Burden Caused by Code Compliance

The tee and pipe material is stainless steel. This weld has a diameter of 6.375 inches and a wall thickness of 0.719 inch. During the ultrasonic examination of this weld, 62.50% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 100% of the weld and base material; 60° shear wave scan from the pipe side perpendicular to the weld covered 50% of the weld and base material. In accordance with Duke Energy Procedure NDE-91, scan areas S1 and S2 are defined as scans perpendicular to the weld and scan areas S3 and S4 are the clockwise and counter-clockwise scans parallel to the weld. A supplemental scan using a 60° refracted longitudinal wave search unit covered 50% of the examination volume on the tee side from one direction perpendicular to the weld but is not included in the coverage calculations because of the requirements of 10CFR50.55 a (b)(2)(xv)(A)(1) which mandates scanning from four directions. The limitation was caused by the radius on the tee side of the weld which prevented placement of the search unit on that side of the weld. In order to scan all of the required volume for this weld, the tee would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

(Examination Data is shown in Attachment B)

VI. Alternate Examinations or Testing

No alternative examinations or testing for the scheduled weld inspection were performed.

VII. Implementation Schedule and Duration

No alternative examinations are planned for the weld during the current inspection interval.

VIII. Justification for Granting Relief

Ultrasonic examination of the weld for Item / Summary Number B09.011.171 was conducted using personnel qualified in accordance with ASME Section XI, Appendix VII. The ultrasonic procedures and equipment used complied with the requirements of ASME Section XI, Appendix VIII as administered by PDI, 1998 Edition through the 2000 Addenda. In addition, a dye penetrant examination was performed on the weld in accordance with the ASME Section XI. No recordable or reportable indications were found. Based on the following justification, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity assurance.

The piping containing weld 2NI55-8 is an ASME III, Class 1 line with a design temperature of 650°F and a design pressure of 2500 psia. The weld is located inside the Unit 2 Containment. This piping line connects the cold leg accumulator 2C to the reactor coolant system and also ties the RHR pump discharge header back to the RCL cold leg 2C. As such, the primary function of this piping is to serve as part of the flow path that a) supplies ECCS injection from the NI and RHR systems to the reactor coolant loop during accident conditions and b) provides core decay heat removal during shutdown / startup operations. This line is normally stagnant during normal plant operation.

Weld 2NI55-8 is a circumferential butt weld on a 6" schedule 160 line between valves 2NI81 and 2NI82. The weld is between a 10" x 10" x 6" seamless, reducing tee and 6" schedule 160 piping. The tee material is SA403 WP316 and the piping is SA376 TP304.

These materials are austenitic (16Cr-12Ni-2Mo for WP316, 18Cr-8Ni for TP304) base materials and a) have a high corrosion resistance with low contribution of corrosion products to the coolant, b) have good mechanical properties and c) are highly weldable. Very few service induced problems with stainless steel in PWR primary system applications have been observed in operating plants. There has been limited susceptibility to stress corrosion cracking due to chloride contamination and cracking in stagnant borated systems. Chemistry limits on chlorides, fluorides and sulfides and dissolved oxygen are controlled by Selected Licensee Commitment (SLC) and other administrative procedures at Catawba to ensure that any favorable conditions for SCC are precluded. Additionally, controls on welding filler material consistent with Regulatory Guide 1.31 also have served to limit the susceptibility of these welds to SCC. No other known degradation mechanisms are applicable to this material at this particular location within the system.

This piping is normally covered by metal reflective insulation. During each refueling outage, multiple walkdowns of containment are performed to determine the presence of external leakage. These walkdowns include a boric acid walkdown (PT/2/A/4150/001H) while the primary system remains at temperature and pressure (Mode 3). Other walkdowns performed during the outage are system engineer walkdowns (PEP 3.09), operation walkdowns at 350 psi, 1000 psi and normal operation pressure (OP/2/A/6100/001) and the ASME XI, IWA 5000, system leakage test. During these various walkdowns, any leakage from this weld would be recognized by active leakage or boron deposit buildups around the valve and mirror insulation.

In addition, leakage during operation (assuming leakby of the primary isolation valve, 2NI82) at the weld location would be detected by various other leakage detection systems available to the operator. (Note: without leakby of the primary isolation valve, leakage would be promptly identified through a continuous decline in the Cold Leg Accumulator level.) These systems identified with plant technical specifications include:

a) Containment Atmosphere Particulate Radioactivity (EMF 38) Monitor which would detect airborne radiological activity;

b) Containment Ventilation Unit Condensate Drain Tank Level Monitor which collects and measures as unidentified leakage the moisture removed from the containment atmosphere;

c) Containment Floor and Equipment Sump Level Monitors where unidentified accumulated water on the containment floor would be monitored and evaluated as sump level changes.

d) A reactor coolant system water inventory balance is performed on a regular basis (i.e. at least once every three days). The normal operating practice is to perform this computer based program on a daily frequency and/or whenever the operators suspect any abnormal changes to other leakage detection systems. A Plant Technical Specification requires system leakage from "unidentified" sources be maintained below 1 gpm; however, plant operation procedure (PT/1(2)/A/4150/001D, NC System Leakage Calculation) establishes an administrative limit of 0.15 gpm above which the source of leakage will be investigated. Leakage as a result of a failed weld discussed in this section would show up as unidentified leakage and subject to the 0.15 gpm administrative limit.

Other leakage detection systems available to the operator include 1) Volume Control Tank (VCT) level changes, 2) VCT make-up frequencies and 3) Cold Leg Accumulator level changes.

These walkdowns and leakage detection systems provide a high level of confidence that any leakage would be promptly identified at this welded joint inside containment. As a result, the limited volumetric coverage associated with this particular weld has no significant impact on the continued assurance of structural integrity of the piping.

References:

1) Weld Isometric CN-2NI-055
2) Piping Isometric CN-2491-NI115
3) Flow Diagram CN-2562-1.1

I. ASME Code Component Affected

Weld ID = 2NV12-10
Item / Summary Number = C05.021.209
Chemical and Volume Control System (NV)
NV System Tee-to-4x3 Reducer Circumferential Weld

II. Applicable Code Edition and Addenda

ASME Section XI Code – 1998 Edition thru the 2000 Addenda
Code Case N-460 is applicable

III. Applicable Code Requirement

Table IWC-2500-1, Examination Category C-F-1
Item / Summary Number C5.21
Figure IWC-2500-7 (a), 100% Volume Coverage of Examination Volume C-D-E-F
Code Case N-460, Greater than 90% Volume Coverage of Examination Volume C-D-E-F

IV. & V. Impracticality/Burden Caused by Code Compliance

The tee and reducer material is stainless steel. This weld has a diameter of 4.5 inches and a wall thickness of 0.531 inch. During the ultrasonic examination of this weld, 78.70% coverage of the required examination volume was obtained. Coverage was limited on the tee side for 8 inches of weld length. There were no limitations on the reducer side of the weld. The percentage of coverage represents the aggregate coverage from all scans performed on the weld and adjacent base material. The coverage from each scan was as follows: 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 100% of the weld and base material; 60° shear wave scan from the reducer side perpendicular to the weld covered 71.60% of the weld and base material in two directions; 60° shear wave scan from the tee side where access was available covered 43.30% of the weld and base material in two directions and 56.74% in one direction. In accordance with Duke Energy Procedure NDE-91, scan areas S1 and S2 are defined as scans perpendicular to the weld and scan areas S3 and S4 are the clockwise and counter-clockwise scans parallel to the weld. A supplemental scan using a 60° refracted longitudinal wave search unit covered 50% of the examination volume on the tee side from one direction perpendicular to the weld in the obstructed areas but is not included in the coverage calculations because of the requirements of 10CFR50.55 a (b)(2)(xv)(A)(1) which mandates scanning from four directions. The limitation was caused by the radius on the tee side of the weld which prevented placement of the search unit on that side. In order to scan all of the required volume for this weld, the tee would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

(Examination Data is shown in Attachment C)

VI. Proposed Alternate Examinations or Testing

No alternative examinations or testing for the scheduled weld inspection were performed.

VII. Implementation Schedule and Duration

No alternative examinations are planned for the weld during the current inspection interval.

VIII. Justification for Granting Relief

Ultrasonic examination of the weld for Item / Summary Number C05.021.209 was conducted using personnel qualified in accordance with ASME Section XI, Appendix VII. The ultrasonic procedures and equipment used complied with the requirements of ASME Section XI, Appendix VIII as administered by PDI, 1998 Edition through the 2000 Addenda. In addition, a dye penetrant examination was performed on the weld in accordance with the ASME Section XI. No recordable or reportable indications were found. Based on the following justification, the amount of coverage obtained for this examination provides an acceptable level of quality and integrity assurance.

Weld 2NV12-10 is between a 4" schedule 160 butt welded tee and a 4" x 3" concentric reducer. The weld is downstream of the Centrifugal Charging (NV) Pump 2B on ASME Class 2 piping with a design temperature of 250°F and design pressure of 2750 psia. The pipe containing this weld is located in the auxiliary building and is pressurized during normal operation. This weld maintains the pressure boundary as part of normal charging flowpath and the ECCS flow path under accident conditions.

The subject weld is between two seamless pipe fitting components made from SA403 WP304 material. This material is an austenitic (18Cr-8Ni) base material that a) has a high corrosion resistance with low contribution of corrosion products to the coolant, b) has good mechanical properties and c) is highly weldable. Very few service induced problems with stainless steel in PWR primary system applications have been observed in operating plants. There has been limited susceptibility to stress corrosion cracking due to chloride contamination and cracking in stagnant borated systems. Chemistry limits on chlorides, fluorides and sulfides are controlled by Selected Licensee Commitment (SLC) and other administrative procedures at Catawba to ensure that any favorable conditions for SCC are precluded. Additionally, controls on welding filler material consistent with Regulatory Guide 1.31 also have served to limit the susceptibility of these welds to SCC. No other known degradation mechanisms are applicable to this material at this particular location within the system.

This piping is not insulated and is located in Room 241 (NV2B Pump Room) on the 543 ft elevation of the auxiliary building. Leakage during normal operation would be seen as active leakage due to low fluid temperature conditions and readily identified on the 543 ft floor elevation below. The room is accessible during normal operation and is within the

scope of daily operation walkdowns. Periodic system engineer walkdowns are also performed that include leakage identification on the NV system.

In addition to walkdowns, this weld location is part of the NC system mass balance performed daily. An operational leak rate test (PT/2/A/4206/006) for the NV system is also performed with the system pressurized on an eighteen month frequency. Furthermore, an ASME XI, IWA-5000 system leakage test is also performed every ISI period. Any of these tests would identify leakage at this particular weld.

These walkdowns and leakage tests provide a high level of confidence that any leakage would be promptly identified at this welded joint in the NV2B Pump room of the Auxiliary Building. As a result, the limited volumetric coverage associated with this particular weld has no significant impact on the continued assurance of structural integrity for the NV piping.

References:

1) Weld Isometric CN-2NV-012
2) Piping Isometric CN-2492-NV076
3) Flow Diagram CN-2554-1.7

IX. Other Information

The following individuals contributed to the development of this relief request:

James J. McArdle (Principal UT NDE Level III Examiner) provided Sections III., IV, V, VI, VII and part of Section VIII.

W.O. Callaway (Catawba Engineering) provided part of Section VIII.

Andy Hogge (Catawba ISI Plan Manager) compiled the remaining sections.

Request for Relief 07-CN-002

Attachment A

Weld 2NI55-11

Number of Pages = 3

Duke Energy.

UT Pipe Weld Examination

Site/Unit: Catawba / 2 | Procedure: NDE-600 | Outage No.: CN2-14-1

Summary No.: B09.011.165 | Procedure Rev.: 16 | Report No.: UT-06-075

Workscope: ISI | Work Order No.: 98738253 | Page: 1 of 3

Code: 1998 thru 2000 Addenda | Cat./Item: B-J- /B9.11.165 | Location:

Drawing No.: CN-2NI-55 | Description: VLV 2NI081 to Pipe

System ID: NI

Component ID: B09.011.165 /2NI55-11 | Size/Length: N/A | Thickness/Diameter: 1.0/10.0

Limitations: Yes- See Attached Limitation Report | Start Time: 1222 | Finish Time: 1332

Examination Surface: Inside ☐ Outside ☑ | Surface Condition: AS GROUND

Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 05125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32821 | Surface Temp.: 68 °F

Cal. Report No.: CAL-06-100, CAL-06-101, CAL-06-102

Angle Used	0	45	45T	60	60L	
Scanning dB			39	41	55	

Indication(s): Yes ☐ No ☑ | Scan Coverage: Upstream ☒ Downstream ☑ CW ☑ CCW ☑

Comments:

FC 05-08

QC 3/29/06

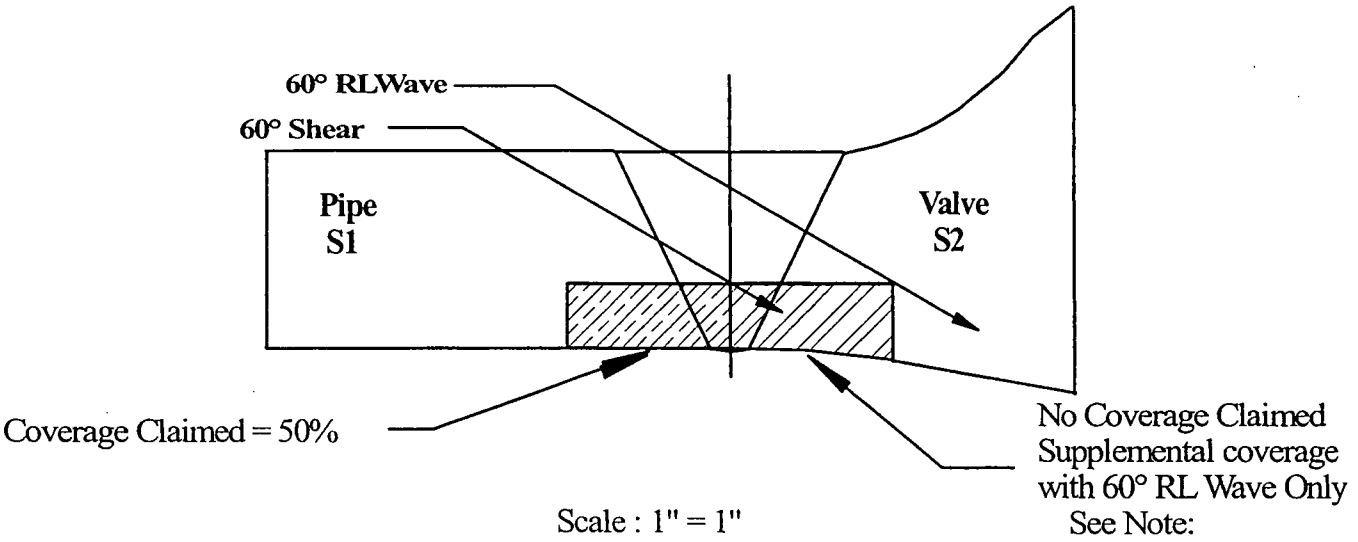
Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-37.5% | Reviewed Previous Data: Yes

Examiner: Mauldin, Larry E.	Level: II-N	Signature: Larry E Mauldin	Date: 3/23/2006	Reviewer		Signature: III	Date: 3/29/06
Examiner: Griebel, David M.	Level: II-N	Signature: D. M. G.	Date: 3/23/2006	Site Review: N/A		Signature	Date
Other: N/A	Level: N/A	Signature	Date	ANII Review	Nancy C Ritchie	Signature: Laughter	Date: 3/30/06

RFR 07-CN-002 ATTACHMENT A

Item No. B09.011.105 Weld No. 2N155-11



Note: 60° RL scan not included in percentage coverage due to requirements of 10CFR50.55a(b)(2)(xv)(A)(1). Best effort scan with 60° RL obtained 50% coverage in one axial direction.

Pipe Ø = **10.75** **Valve = Surface 2** **Pipe = Surface 1**

"t" = **1.0**

1/3 "t" = **0.33**

Weld Length = **33.8**

Weld + 1/4" ea. Side = **1.70**

Total Weld Volume

= (Weld + 1/4" ea. Side) x 1/3 "t" x Weld Length

= **18.96** in ^{3}

Aggregate Coverage Calculation

S2 = Valve	**0 %**	(0% of the Length x 0% of the Volume)
S1 = Pipe	**50 %**	(100% of the Length x 50% of the Volume)
S3 = CW	**50 %**	(100% of the Length x 50% of the Volume)
S4 = CCW	**50 %**	(100% of the Length x 50% of the Volume)

Total = 150 ÷ 4 = 37.5% Aggregate Coverage

Inspector / Date: JH III 3/29/06

DUKE POWER COMPANY
ISI LIMITATION REPORT

Component/Weld ID: 2NI55-11 **Item No:** B09.011.165

remarks: Due to Valve Configuration

☐ NO SCAN	SURFACE	BEAM DIRECTION
☒ LIMITED SCAN	☐ 1 ☒ 2	☒ 1 ☐ 2 ☒ cw ☒ ccw
FROM L N/A to L N/A	INCHES FROM W0 1.5" to Beyond	
ANGLE: ☐ 0 ☒ 45 ☒ 60 other ____	FROM 0 DEG to 360 DEG	
☐ NO SCAN	SURFACE	BEAM DIRECTION
☐ LIMITED SCAN	☐ 1 ☐ 2	☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L ____ to L ____	INCHES FROM W0 ____ to ____	
ANGLE: ☐ 0 ☐ 45 ☐ 60 other ____	FROM ____ DEG to ____ DEG	
☐ NO SCAN	SURFACE	BEAM DIRECTION
☐ LIMITED SCAN	☐ 1 ☐ 2	☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L ____ to L ____	INCHES FROM W0 ____ to ____	
ANGLE: ☐ 0 ☐ 45 ☐ 60 other ____	FROM ____ DEG to ____ DEG	
☐ NO SCAN	SURFACE	BEAM DIRECTION
☐ LIMITED SCAN	☐ 1 ☐ 2	☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L ____ to L ____	INCHES FROM W0 ____ to ____	
ANGLE: ☐ 0 ☐ 45 ☐ 60 other ____	FROM ____ DEG to ____ DEG	

Sketch(s) attached ☐ yes ☒ No

Prepared By: Larry Mauldin *Larry Mauldin* Level: II Date: 03-23-2006 Sheet 3 of 3

Reviewed By: *[signature]* III Date: 3/29/06 Authorized Inspector: *Nancy C Ritchie Slaughter* Date: 3/31/06

Request for Relief 07-CN-002

Attachment B

Weld 2NI55-8

Number of Pages = 3

UT Pipe Weld Examination

Site/Unit: Catawba / 2 | Procedure: NDE-600 | Outage No.: CN2-14-1

Summary No.: B09.011.171 | Procedure Rev.: 16 | Report No.: UT-06-072

Workscope: ISI | Work Order No.: 98738253 | Page: 1 of 2 3

Code: 1998 thru 2000 Addenda | Cat./Item: B-J- /B9.11.171 | Location: 9L 3/29/06

Drawing No.: CN-2NI-55 | Description: Pipe to Tee

System ID: NI

Component ID: B09.011.171 /2NI55-8 | Size/Length: N/A | Thickness/Diameter: .719 / 6.0

Limitations: Yes-See Attached Limitation Report | Start Time: 1234 | Finish Time: 1307

Examination Surface: Inside ☐ Outside ☑ | Surface Condition: GROUND

Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 05125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32821 | Surface Temp.: 68 °F

Cal. Report No.: CAL-06-091, CAL-06-092, CAL-06-093

Angle Used	0	45	45T	60	60L	
Scanning dB			45	50	60	

Indication(s): Yes ☐ No ☑ | Scan Coverage: Upstream ☑ Downstream ☐ CW ☑ CCW ☑

Comments:

FC 05-08

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: NO - 62.5% ~~Yes~~ 9L 3/23/06 | Reviewed Previous Data: Yes

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Resor, James H.	II	James H Resor	3/23/2006		III	3/29/06
Examiner	Level	Signature	Date	Site Review	Signature	Date
Cochran, Lonnie D.	II-N	Lon D Cochran	3/23/2006	N/A		
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A				Nancy C Ritchie Shighter	3/31/06

RFR 07-CN-002 ATTACHMENT B

% Coverage Calculations

Item No. : B09.011.171 **Weld No. : 2NI55-8**

Pipe Ø = **6.625**

"t" = **0.719**

1/3 "t" = **0.24**

Weld Length = **20.8**

Weld + 1/4" ea. Side = **1.70**

Total Exam Volume 100%

= (Weld + 1/4" ea. Side) x 1/3 "t" x Weld Length

= **8.49** in ^{3}

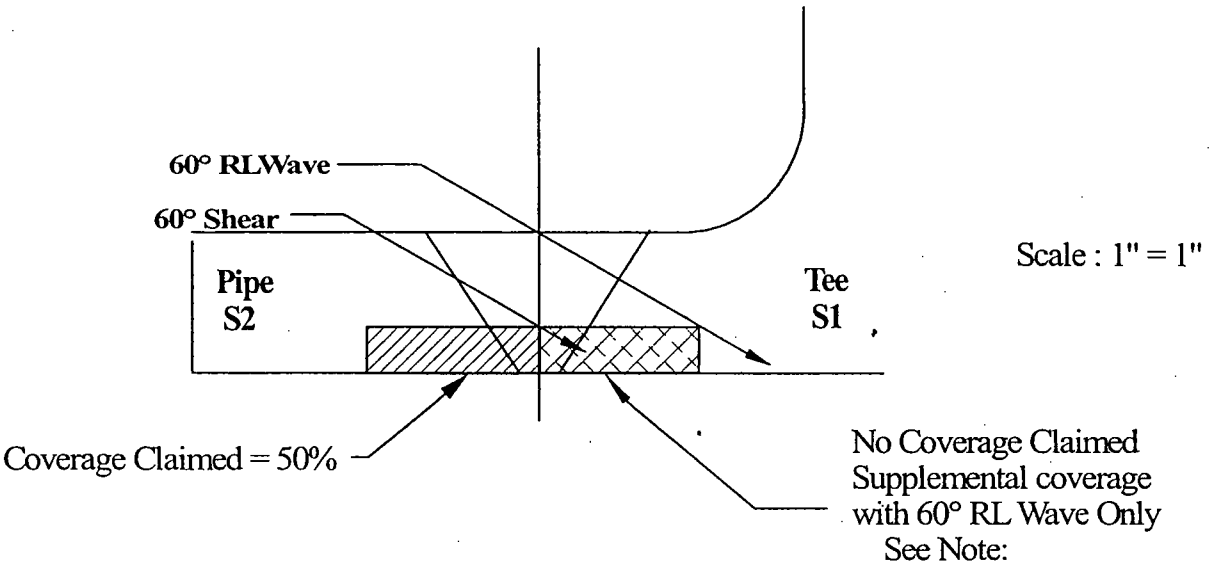
No scan with the 60° shear wave axial from the Surface 1 side of the weld due to the Tee configuration.

Aggregate Coverage Calculation

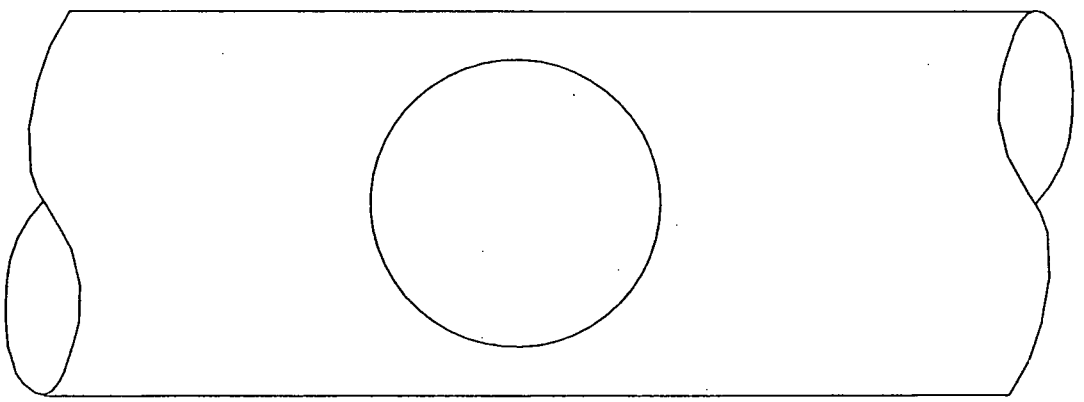
S1 = Tee	**0 %**	(0% of the Length x 0% of the Volume)
S2 = Pipe	**50 %**	(100% of the Length x 50% of the Volume)
S3 = CW	**100 %**	(100% of the Length x 100% of the Volume)
S4 = CCW	**100 %**	(100% of the Length x 100% of the Volume)

Total = 250 ÷ 4 = 62.5% Aggregate Coverage

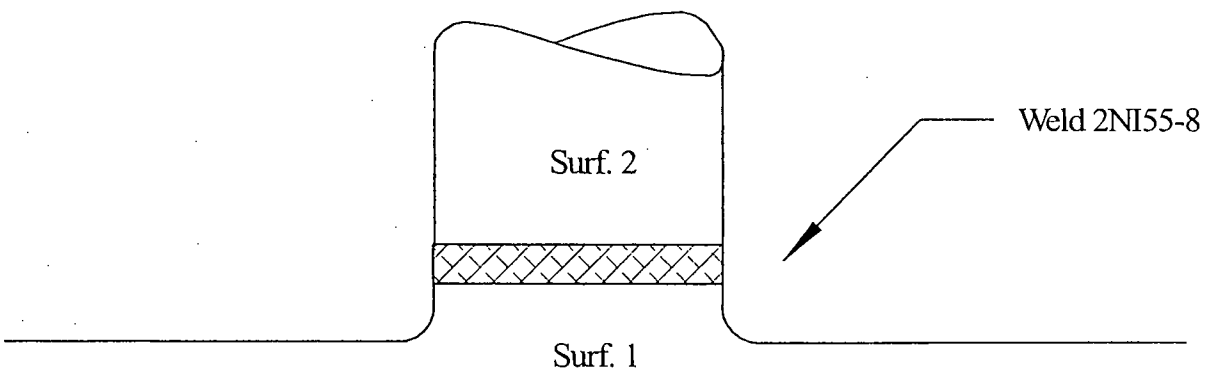
Inspector / Date: JJL 3/29/04



Note: 60° RL scan not included in percentage coverage due to requirements of 10CFR50.55a(b)(2)(xv)(A)(1). Best effort scan with 60° RL obtained 50% coverage in one axial direction.



Side View - Not to Scale



Plan View - Not to Scale

No scan with the 60° axial from the Surface 1 side of the weld due to the Tee configuration.

Inspector / Date : _____ 3/29/06 _____ Page 3 of 3

Request for Relief 07-CN-002

Attachment C

Weld 2NV12 - 10

Number of Pages = 4

UT Pipe Weld Examination

Duke Energy.

Site/Unit:	Catawba / 2	Procedure:	NDE-600	Outage No.:	CN2-14-1
Summary No.:	C05.021.209	Procedure Rev.:	16	Report No.:	UT-06-029
Workscope:	ISI	Work Order No.:	98761101	Page:	1 of 3

Code: 1998 thru 2000 Addenda Cat./Item: C-F-1/C5.21.209 Location:

Drawing No.: CN-2NV-12 Description: Tee to 4X3 Reducer

System ID: NV

Component ID: C05.021.209 /2NV12-10 Size/Length: N/A Thickness/Diameter: .531/4.0

Limitations: Yes - See Attached Limitation Reports Start Time: 1521 Finish Time: 1528

Examination Surface: Inside ☐ Outside ☑ Surface Condition: AS GROUND

Lo Location: 9.1.1.1 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 05125

Temp. Tool Mfg.: D.A.S Serial No.: MCNDE32821 Surface Temp.: 77 °F

Cal. Report No.: CAL-06-057, CAL-06-058

Angle Used	0	45	45T	60		
Scanning dB			45	48.5		

Indication(s): Yes ☐ No ☑ Scan Coverage: Upstream ☑ Downstream ☑ CW ☑ CCW ☑

Comments:

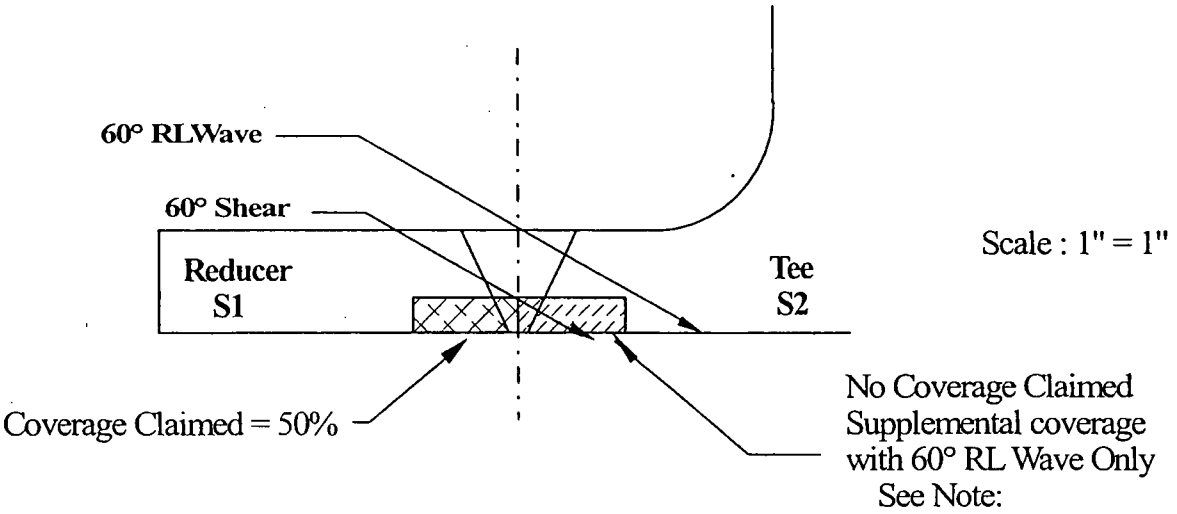
FC 05-08

Results: Accept ☑ Reject ☐ Info ☐

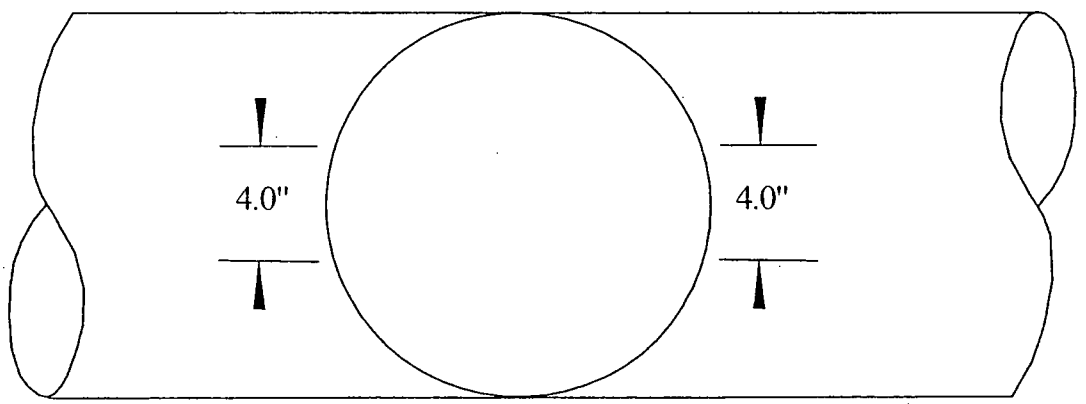
Percent Of Coverage Obtained > 90%: No-78.7% Reviewed Previous Data: Yes

Examiner: Leeper, Winfred C.	Level: II	Signature: Winfred C. Leeper	Date: 3/1/2006	Reviewer: J E Howser	Signature: Date: 3.6.06
Examiner: Cochran, Lonnie D.	Level: II-N	Signature: Lonnie D Cochran	Date: 3/1/2006	Site Review: N/A	Signature: Date:
Other: N/A	Level: N/A	Signature:	Date:	ANII Review: Nancy C Ritchie Sloughter	Signature: Date: 3/9/06

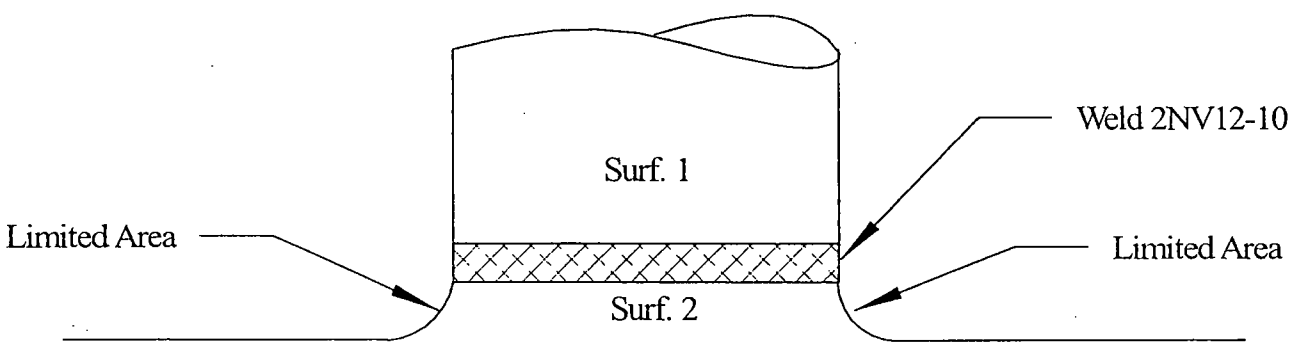
RFR 07-CN-002 ATTACHMENT C



Note: 60° RL scan not included in percentage coverage due to requirements of 10CFR50.55a(b)(2)(xv)(A)(1). Best effort scan with 60° RL obtained 50% coverage in one axial direction.



Plan View - Not to Scale



Side View - Not to Scale

Limited 4" on ea. side of Tee in throat area for a total of 8". From Lo + 1.5" to 5.5" and from Lo + 8.5" to 12.5" on Surface 2.

Inspector / Date : JTL 3/2/06 Page 2 of 3

Item No. : C05.021.209 **Weld No. : 2NV12-10**

% Coverage Calculations

Pipe Ø = **4.5**

"t" = **0.531**

1/3 "t" = **0.18**

Weld Length = **14.1**

Weld + 1/4" ea. Side = **1.10**

Length of Obstucted Area = **8.00**

Total Exam Volume 100%

= (Weld + 1/4" ea. Side) x 1/3 "t" x Weld Length

= **2.79** in ^{3}

% of Length not Examined 100%

= (Length of Obstucted Area) ÷ (Weld Length) x 100

= **56.7** %

% of Length Examined 100%

= 100% - % not Examined

= **43.3** %

Aggregate % of Coverage

S1 - Reducer = % of Length Examined 100% + % of Length not Examined 100% ÷ 2
= 43.3 + 28.4
= **71.6** %

S2 - Tee = % of Length Examined 100% - % of Length not Examined 100%
= 100 - 56.7
= **43.3** %

S3 - CW = **100**% of Length Examined

S4 - CCW = **100**% of Length Examined

= (S1 + S2 + S3 + S4) ÷ 4 = **78.7 % Coverage**

Inspector / Date: JH III 3/2/06 **Page** 3 **of** 3

Duke Energy

UT Pipe Weld Examination

Site/Unit: Catawba / 2 | Procedure: NDE-600 | Outage No.: CN2-14-1

Summary No.: C05.021.209 | Procedure Rev.: 16 | Report No.: UT-06-030

Workscope: ISI | Work Order No.: 98761101 | Page: 1 of 1

Code: 1998 thru 2000 Addenda | Cat./Item: C-F-1/C5.21.209 | Location:

Drawing No.: CN-2NV-12 | Description: Tee to 4X3 Reducer

System ID: NV

Component ID: C05.021.209 /2NV12-10 | Size/Length: N/A | Thickness/Diameter: .531/4.0

Limitations: Yes - See Attached Limitation Report | Start Time: 1350 | Finish Time: 1353

Examination Surface: Inside ☐ Outside ☑ | Surface Condition: AS GROUND

Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 05125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32821 | Surface Temp.: 77 °F

Cal. Report No.: CAL-06-059

Angle Used	0	45	45T	60	60L	
Scanning dB					48	

Indication(s): Yes ☐ No ☑ | Scan Coverage: Upstream ☐ Downstream ☑ CW ☐ CCW ☐

Comments:

FC 05-08

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No-78.7% | Reviewed Previous Data: Yes

Examiner: Leeper, Winfred C.	Level: II	Signature: Winfred C Leeper	Date: 3/2/2006	Reviewer: DE Howser	Signature:	Date: 3.6.06
Examiner: Jolly, B. Dale	Level: II-N	Signature: B. Dale Jolly	Date: 3/2/2006	Site Review: N/A	Signature:	Date:
Other: N/A	Level: N/A	Signature:	Date:	ANII Review:	Signature: Nancy C Ritchie Stoughton	Date: 3/9/06