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August 27, 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 1
Docket Number 50-413
Request for Relief Number 07-CN-004
Limited Weld Examinations During the End-of-Cycle 16 Refueling Outage

Pursuant to 10 CFR 50.55a(g)(5)(iii), please find attached Request for Relief 07-CN-004. This request for relief is associated with limited weld examinations during inservice inspection activities for the subject refueling outage.

The attachment to this letter contains all technical information necessary in support of this request for relief. Duke is requesting NRC review and approval of this request at your earliest convenience.

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

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

Very truly yours,

James R. Morris

LJR/s

Attachment

A047

NRR

xc (with attachment):

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bxc (with attachment):

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R.N. McGill
RGC File
Document Control File 801.01
ELL-EC05O
NCMPA-1
NCEMC
PMPA
SREC

Attachment

Request for Relief 07-CN-004

Relief Request 07-CN-004

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

Inservice Inspection Impracticality

Duke Energy Corporation

Catawba Nuclear Station – Unit 1 (EOC-16)

Third 10-Year Interval – Inservice Inspection Plan

Interval Start Date = 6-29-2005 Interval End Date = 6-29-2015

This Relief Request has ten (10) welds for which relief is being sought.

The ID's and Item / Summary Numbers for the ten (10) welds are as follows:

List Number	Weld ID	Item / Summary Numbers
1.	1NC28-11	B09.011.020
2.	1NC31-1	B09.011.030
3.	1NI18-2	B09.011.155
4.	1NI148-10	B09.011.163
5.	1NI148-11	B09.011.164
6.	1SWRF-1-OUTLET	C02.011.003
7.	1ND3-1	C05.011.065
8.	1NI1-12	C05.011.105
9.	1NV-309-INLET	C05.021.146
10.	1NV-309-OUTLET	C05.021.147

Attachment A contains the inspection data for Weld ID 1NC28-11.
Attachment B contains the inspection data for Weld ID 1NC31-1.
Attachment C contains the inspection data for Weld ID 1NI18-2.
Attachment D contains the inspection data for Weld ID 1NI148-10.
Attachment E contains the inspection data for Weld ID 1NI148-11.
Attachment F contains the inspection data for Weld ID 1SWRF-1-OUTLET
Attachment G contains the inspection data for Weld ID 1ND3-1.
Attachment H contains the inspection data for Weld ID 1NI1-12.
Attachment I contains the inspection data for Weld ID 1NV-309-INLET.
Attachment J contains the inspection data for Weld ID 1NV-309-OUTLET.

Items in this relief request were examined during August, November, and December, 2006.

I. ASME Code Component Affected

Weld ID = 1NC28-11
Item / Summary Number = B09.011.020
Reactor Coolant System (NC)
NC System Elbow to Valve 1NI134 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

Weld joint geometry and material selection caused limitations resulting in the inability to achieve the required coverage. The valve and elbow material is stainless steel. This weld has a diameter of 6.625 inches and a wall thickness of 0.714 inch. During the ultrasonic examination of this weld, 35.10% 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 elbow side perpendicular to the weld covered 40.50% 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 22.20% 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 prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned and replaced 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

Use of radiography (RT) to achieve more coverage has been evaluated. RT is less sensitive to service induced cracking and has not been subjected to the performance demonstration requirements in a manner similar to the ultrasonic method. Therefore, while RT could in most cases provide more coverage, the reduction in sensitivity and lack of performance demonstration mitigates its use.

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 B09.011.020 was conducted using personnel qualified in accordance with ASME Section XI, Appendix VII. The ultrasonic procedures, personnel and equipment used complied with the requirements of ASME Section XI, Appendix VIII, 1998 Edition through the 2000 Addenda as administered by the Performance Demonstration Initiative (PDI). 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.

The piping containing weld 1NC28-11 is an ASME III, Class 1 line with a design temperature of 650°F and a design pressure of 2500 psia. This weld is located inside the Unit 1 containment. The piping line containing this weld connects the safety injection (NI) pump 1A discharge to the reactor coolant system hot leg 1B. As such, the primary function of this piping is to serve as 1) the reactor coolant system pressure boundary during normal operation and 2) part of the flow path that provides ECCS injection from the NI system to the reactor coolant loop during accident conditions.

Weld 1NC28-11 is a circumferential butt weld on a 6" schedule 160 line just downstream of check valve 1NI134. The weld is between the 6" valve and a 45° (cut at 22°) seamless, butt welded elbow. The elbow material is SA403 WP304 and the valve body is SA182 F316.

These materials are austenitic (18Cr-8Ni for SA403 WP304, 16Cr-12Ni-2Mo for SA182 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 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 Stress Corrosion Cracking (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/1/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/1/A/6100/001) and the ASME XI, IWB 5220, Class A System Leakage Test Procedure MP/0/A/7650/088A. 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 at this weld location 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 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/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 parameters available to the operator include 1) Volume Control Tank (VCT) level changes, 2) VCT make-up frequencies, 3) Cold Leg Accumulator level

changes, 4) Containment Humidity indication and 5) Containment Air Temperature and Pressure variations.

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-1NC-0028
2) Piping Isometric CN-1491-NC058
3) Flow Diagram CN-1562-1.2
4) Flow Diagram CN-1553-1.0
5) Valve Drawing for 1NI134, CNM-1205.00-0063
6) Technical Specification 3.4.13, RCS Operational Leakage
7) Technical Specification 3.4.15, RCS Leakage Detection Instrumentation

I. ASME Code Component Affected

Weld ID = 1NC31-1
Item / Summary Number = B09.011.030
Reactor Coolant System (NC)
NC System Valve 1NI160 to Elbow 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

Weld joint geometry and material selection caused limitations resulting in the inability to achieve the required coverage. The valve and elbow materials are stainless steel. This elbow has a diameter of 6.375 inches and a wall thickness of 0.719 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 on the elbow side; 60° shear wave scan from the elbow 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 20% 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 slope on the valve side of the weld which prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned and replaced 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

Use of radiography (RT) to achieve more coverage has been evaluated and discarded because RT is less sensitive to service induced cracking and has not been subjected to the performance demonstration requirements in a manner similar to the ultrasonic method. While RT could in most cases provide more coverage the loss of sensitivity and lack of performance demonstration mitigates against its use.

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 B09.011.030 was conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII. The ultrasonic procedures, personnel and equipment used complied with the requirements of ASME Section XI, Appendix VIII, 1998 Edition through the 2000 Addenda as administered by the Performance Demonstration Initiative (PDI),. 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.

The piping containing weld 1NC31-1 is an ASME III, Class 1 line with a design temperature of 650°F and a design pressure of 2500 psia. This weld is located inside the Unit 1 containment. The piping line containing this weld connects the safety injection (NI) pump 1B discharge to the reactor coolant system hot leg 1D. As such, the primary function of this piping is to serve as 1) the reactor coolant system pressure boundary during normal operation and 2) part of the flow path that provides ECCS injection from the NI system to the reactor coolant loop during accident conditions.

Weld 1NC31-1 is a circumferential butt weld on a 6" schedule 160 line just downstream of check valve 1NI0160. The weld is between the 6" valve and a 45° (cut at 22°) seamless, butt welded elbow. The elbow material is SA403 WP304 and the valve body is SA182 F316.

These materials are austenitic (18Cr-8Ni for SA403 WP304, 16Cr-12Ni-2Mo for SA182 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 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. However 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 Stress Corrosion Cracking (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/1/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/1/A/6100/001) and the ASME XI, IWB 5220, Class A System Leakage Test Procedure MP/0/A/7650/088A. 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 at this weld location 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 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/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 parameters available to the operator include 1) Volume Control Tank (VCT) level changes, 2) VCT make-up frequencies, 3) Cold Leg Accumulator level changes, 4) Containment Humidity indication and 5) Containment Air Temperature and Pressure variations.

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-1NC-0031
2) Piping Isometric CN-1491-NC060
3) Flow Diagram CN-1562-1.2
4) Flow Diagram CN-1553-1.0
5) Valve Drawing for 1NI160, CNM-1205.00-0063
6) Technical Specification 3.4.13, RCS Operational Leakage
7) Technical Specification 3.4.15, RCS Leakage Detection Instrumentation

I. ASME Code Component Affected

Weld ID = 1NI18-2
Item / Summary Number = B09.011.155
Safety Injection System (NI)
NI System Valve 1NI76A 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

Weld joint geometry and material selection caused limitations resulting in the inability to achieve the required coverage. The valve and pipe materials are 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, 62.50% coverage of the required examination volume was obtained. Coverage was limited to the pipe side for 100% of weld length. 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 one direction perpendicular to the weld. 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 slope on the valve side of the weld which prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned and replaced 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

Use of radiography (RT) to achieve more coverage has been evaluated and discarded because RT is less sensitive to service induced cracking and has not been subjected to the performance demonstration requirements in a manner similar to the ultrasonic method. While RT could in most cases provide more coverage the loss of sensitivity and lack of performance demonstration mitigates against its use.

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 B09.011.155 was conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII. The ultrasonic procedures, personnel and equipment used complied with the requirements of ASME Section XI, Appendix VIII, 1998 Edition through the 2000 Addenda as administered by the Performance Demonstration Initiative (PDI). 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.

The piping containing weld 1NI18-2 is an ASME III, Class 1 line with a design temperature of 650°F and a design pressure of 2500 psia. This weld is located inside the Unit 1 containment. The associated piping line connects the cold leg accumulator 1C to the reactor coolant system cold leg 1C. As such, the primary function of this piping is to serve as part of the flow path that provides ECCS injection from the NI system to the reactor coolant loop during accident conditions. The piping containing this weld is exposed to cold leg accumulator pressure of 650 psig and ambient containment temperature (approximately 100°F) during normal operating conditions.

Weld 1NI18-2 is a circumferential butt weld on a 10" line immediately downstream of motor operated gate valve 1NI076A. The weld is between the 10" valve and the 10 schedule 140 piping. The pipe material is SA376 TP316 and the valve body is SA182 F316.

These materials are austenitic (16Cr-12Ni-2Mo) 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. However 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 Stress Corrosion Cracking (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/1/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/1/A/6100/001) and the ASME XI, IWB 5220, Class A System Leakage Test Procedure MP/0/A/7650/088A. 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 this weld location would be detected primarily by a decrease in the cold leg accumulator level. The Containment Floor and Equipment Sump Level Monitors would also provide indication of leakage at this location. However, without primary valve leakage, reactor coolant inventory would not be affected by a through wall leak here. Thus leakage detection by the Containment Atmosphere Particulate Radioactivity Monitor, the Containment Ventilation Unit Condensate Drain Tank Level Monitor or reactor coolant system water inventory balance would not be as effective in leakage detection.

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-1NI-0018

2) Piping Isometric CN-1491-NI046

3) Flow Diagram CN-1562-1.1

4) Valve Drawing for 1NI076A, CNM-1205.00-0071

6) Technical Specification 3.4.13, RCS Operational Leakage

7) Technical Specification 3.4.15, RCS Leakage Detection Instrumentation

I. ASME Code Component Affected

Weld ID = 1NI148-10
Item / Summary Number = B09.011.163
Safety Injection System (NI)
NI System Tee to Valve 1NI81 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

Weld joint geometry and material selection caused limitations resulting in the inability to achieve the required coverage. The valve and tee 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 41.50% 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 prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned and replaced 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 D)

VI. Alternate Examinations or Testing

Use of radiography (RT) to achieve more coverage has been evaluated and discarded because RT is less sensitive to service induced cracking and has not been subjected to the performance demonstration requirements in a manner similar to the ultrasonic method. While RT could in most cases provide more coverage the loss of sensitivity and lack of performance demonstration mitigates against its use.

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 B09.011.163 was conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII. The ultrasonic procedures, personnel and equipment used complied with the requirements of ASME Section XI, Appendix VIII, 1998 Edition through the 2000 Addenda as administered by the Performance Demonstration Initiative (PDI). 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.

The piping containing weld 1NI148-10 is an ASME III, Class 1 line with a design temperature of 650°F and a design pressure of 2500 psia. This weld is located inside the Unit 1 containment. This piping line containing this weld connects the cold leg accumulator 1C to the reactor coolant system and also ties the RHR pump discharge header to the RCL cold leg 1C. 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 stagnant during normal plant operation.

Weld 1NI148-10 is a circumferential butt weld on a 10" schedule 140 line just downstream of check valve 1NI0081. The weld is between the 10" valve and the run side of a 10" x 10" x 6" electronic fusion welded, reducing tee. The tee material is SA403 WP316 and the valve body is SA182 F316.

These materials are austenitic (16Cr-12Ni-2Mo) 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. However 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 Stress Corrosion Cracking (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/1/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/1/A/6100/001) and the ASME XI, IWB 5220, Class A System Leakage Test Procedure MP/0/A/7650/088A. 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 (assuming leakby of the primary isolation valve, 1NI0082) at this 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 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/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 parameters available to the operator include 1) Volume Control Tank (VCT) level changes, 2) VCT make-up frequencies, 3) Cold Leg Accumulator level changes, 4) Containment Humidity indication and 5) Containment Air Temperature and Pressure variations.

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-1NI-0148
2) Piping Isometric CN-1491-NI015
3) Flow Diagram CN-1562-1.1
4) Valve Drawing for 1NI081, CNM-1205.00-0062
6) Technical Specification 3.4.13, RCS Operational Leakage
7) Technical Specification 3.4.15, RCS Leakage Detection Instrumentation

I. ASME Code Component Affected

Weld ID = 1NI148-11
Item / Summary Number = B09.011.164
Safety Injection System (NI)
NI System Tee to Valve 1NI82 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

Weld joint geometry and material selection caused limitations resulting in the inability to achieve the required coverage. The valve and tee 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 100% of the weld and base material; 60° shear wave scan from the tee 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 39.70% 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 prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned and replaced 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 E)

VI. Alternate Examinations or Testing

Use of radiography (RT) to achieve more coverage has been evaluated and discarded because RT is less sensitive to service induced cracking and has not been subjected to the performance demonstration requirements in a manner similar to the ultrasonic method. While RT could in most cases provide more coverage the loss of sensitivity and lack of performance demonstration mitigates against its use.

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 B09.011.164 was conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII. The ultrasonic procedures, personnel and equipment used complied with the requirements of ASME Section XI, Appendix VIII, 1998 Edition through the 2000 Addenda as administered by the Performance Demonstration Initiative (PDI). 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.

The piping containing weld 1NI148-11 is an ASME III, Class 1 line with a design temperature of 650°F and a design pressure of 2500 psia. This weld is located inside the Unit 1 containment. This piping line containing this weld connects the cold leg accumulator 1C to the reactor coolant system and also ties the RHR pump discharge header to the RCL cold leg 1C. 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 1NI148-11 is a circumferential butt weld on a 10" schedule 140 line just upstream of check valve 1NI0082. The weld is between the 10" valve and the run side of a 10" x 10" x 6" electronic fusion welded, reducing tee. The tee material is SA403 WP316 and the valve body is SA182 F316.

These materials are austenitic (16Cr-12Ni-2Mo) 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. However 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 Stress Corrosion Cracking (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 weld is at a mirror insulation boundary. 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/1/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/1/A/6100/001) and the ASME XI, IWB 5220, Class A System Leakage Test Procedure MP/0/A/7650/088A. During these various walkdowns, any leakage from this weld would be recognized by active leakage or boron deposit buildups around the valve, piping or mirror insulation.

In addition, leakage during operation (assuming leakby of the primary isolation valve, 1NI0082,) at this 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 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/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 parameters available to the operator include 1) Volume Control Tank (VCT) level changes, 2) VCT make-up frequencies, 3) Cold Leg Accumulator level changes, 4) Containment Humidity indication and 5) Containment Air Temperature and Pressure variations.

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-1NI-0148

2) Piping Isometric CN-1491-NI015

3) Flow Diagram CN-1562-1.1

4) Valve Drawing for 1NI082; CNM-1205.00-0062

6) Technical Specification 3.4.13, RCS Operational Leakage

7) Technical Specification 3.4.15, RCS Leakage Detection Instrumentation

I. ASME Code Component Affected

Weld ID = 1SWRF-1-OUTLET
Item / Summary Number = C02.011.003
Chemical and Volume Control System (NV)
NV System Nozzle to Shell 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-B
Item / Summary Number C2.11
Figure IWC-2500-3 (a), 100% Volume Coverage of Examination Volume A-B
Code Case N-460, Greater than 90% Volume Coverage of Examination Volume A-B

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

The vessel, nozzle and weld materials are stainless steel. The nozzle side of the weld has a diameter of 2.875". During the Liquid Penetrant examination of this weld, 74.60% coverage of the required surface examination area was obtained. The areas that were not examined were inaccessible due to the proximity of the Seal Water Filter Housing Legs to the Nozzle to Shell Weld. Two of the four Housing Legs are welded to the vessel in a manner that covers a portion of the required base metal on the vessel side of the weld at both 90°and 270° as shown on the surface exam data in Attachment F. The Liquid Penetrant exam performed covered 100% of the weld and the required base metal on the nozzle side of the weld. The required area of base metal on the vessel side of the weld was examined from 350° to 10° and 170° to 190°; however the base metal from 10° to 170° and 190° to 350° was inaccessible due to the legs. In order to perform a Liquid Penetrant exam on all of the required surfaces, the welds attaching the legs to the shell would have to be cut out and the legs removed, which is impractical. There were no recordable indications found during the inspection of this weld.

(Examination Data is shown in Attachment F)

VI. Alternate Examinations or Testing

Use of the ultrasonic inspection method was evaluated for inspecting the limited area. Due to the stainless steel material and configuration of the component and the close proximity of the legs to the weld, the area was not accessible for ultrasonic examination.

A Pressure Test and Visual Examination VT-2 were completed on this component with no observed leakage.

VII. Implementation Schedule and Duration

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

VIII. Justification for Granting Relief

Liquid Penetrant examination of the weld for Item / Summary Number C02.011.003 was conducted using personnel qualified in accordance with ASME Section XI, 1998 Edition through 2000 Addenda. The Liquid Penetrant examination was performed on the weld using exam procedures that are in accordance with ASME Section XI. No recordable or rejectable indications were found.

Weld 1SWRF-1-OUTLET is located on the outlet side of the Unit 1 Seal Water Return Filter. This filter is an ASME III, Class 2 component with a design temperature of 250°F and a design pressure of 315 psia. The filter is part of the letdown flowpath of the NV (Chemical and Volume Control) System and is located in room 451 on Elevation 560 of the auxiliary building.

Weld 1SWRF-1-OUTLET is a circumferential nozzle weld connecting the shell of the filter housing to the 2" outlet nozzle. The shell material is SA312 TP304 fabricated from a 6" schedule 10S pipe. The nozzle material is SA479 TP304. These materials are austenitic (18Cr-8Ni) 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 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.

During normal operation, the pressure at the filter is approximately 40 psi. This low pressure and the related low operating stresses minimize the susceptibility to pressure boundary leakage. If a failure were to occur at this location, it would be identified through the periodic reactor coolant system water inventory balance or through changes in volume control tank levels. Any failure resulting in leakage or evidence of leakage would also be detected during periodic filter cartridge changeouts.

The combination of low operating stresses and the small margin between the required and achieved surface examination coverage indicate that the likelihood of pressure boundary failure at this location is small. Furthermore, should a failure occur, the leak would be promptly identified. As a result, the limited surface examination coverage associated with this particular weld has no significant impact on the continued assurance of structural integrity of the filter.

References:

1) Seal Water Return Filter Drawing CNM-1201.04-0078
2) Flow Diagram CN-1554-1.6
3) Auxiliary Building Drawing CN-1200-8.2
4) Auxiliary Building Drawing CN-1220-27
5) Technical Specification 3.4.13, RCS Operational Leakage

I. ASME Code Component Affected

Weld ID = 1ND3-1
Item / Summary Number = C05.011.065
Residual Heat Removal System (ND)
ND System Valve 1NI185A 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 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

Weld joint geometry and material selection caused limitations resulting in the inability to achieve the required coverage. The valve and pipe materials are stainless steel. This weld has a diameter of 18 inches and a wall thickness of 0.562 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 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 and a 70° shear wave covered 3.50% of the examination volume on the valve side and 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 prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned and replaced 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 G)

VI. Alternate Examinations or Testing

Use of radiography (RT) to achieve more coverage has been evaluated and discarded because RT is less sensitive to service induced cracking and has not been subjected to the performance demonstration requirements in a manner similar to the ultrasonic method. While RT could in most cases provide more coverage the loss of sensitivity and lack of performance demonstration mitigates against its use.

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 C05.011.065 was conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII. The ultrasonic procedures, personnel and equipment used complied with the requirements of ASME Section XI, Appendix VIII, 1998 Edition through the 2000 Addenda as administered by the Performance Demonstration Initiative (PDI),. 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.

Weld 1ND3-1 is between 18" schedule 40 Electronic Fusion Welded piping and valve 1NI185A. The associated piping is ASME Class 2 piping with a design temperature of 400°F and design pressure of 540 psia. The weld is in the flowpath from the Train 1A, ECCS sump to the suction of the ND Pump 1A. At this location, this weld acts to maintain the pressure boundary 1) as part of ECCS flow path under accident conditions and 2) as part of the core heat removal flow path during startup / shutdown operations. The pipe containing this weld is located in the auxiliary building and is at ambient temperature conditions and statically pressurized during normal operation.

The subject weld is between the valve body of 1NI185A (SA182 F316 body) and 18" SA358, Class 1, TP304, EFW schedule 40 piping. These materials are austenitic (18Cr-8Ni for SA358 TP304, 16Cr-12Ni-2Mo for SA182 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 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. However 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 Stress Corrosion Cracking (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 217 (Unit 1 Mechanical Penetration 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 floor 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 ND system.

In addition to walkdowns, an operational leak rate determination test (PT/1/A/4203/003) for the ND system is performed with the system pressurized on an eighteen month frequency. An ASME XI, IWC-5220 system leakage test (Procedure MP/0/A/7650/088A) 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 Unit 1 Mechanical Penetration 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 ND piping.

References:

1) Weld Isometric CN-1ND-0003
2) Piping Isometric CN-1492-ND001
3) Piping Isometric CN-1492-ND002
4) Flow Diagram CN-1561-1.0
5) Flow Diagram CN-1562-1.3
6) Valve Drawing for 1NI185A, CNM-1205.00-0073

I. ASME Code Component Affected

Weld ID = 1NI1-12
Item / Summary Number = C05.011.105
Safety Injection System (NI)
NI System Pipe to Valve 1NI180 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 C5.11
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

Weld joint geometry and material selection caused limitations resulting in the inability to achieve the required coverage. The valve and pipe material is stainless steel. This weld has a diameter of 6.625 inches and a wall thickness of .719 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 18.90% 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 prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned and replaced to allow scanning from both sides of the weld, which is impractical.

(Examination Data is shown in Attachment H)

VI. Alternate Examinations or Testing

Use of radiography (RT) to achieve more coverage has been evaluated and discarded because RT is less sensitive to service induced cracking and has not been subjected to the performance demonstration requirements in a manner similar to the ultrasonic method. While RT could in most cases provide more coverage the loss of sensitivity and lack of performance demonstration mitigates against its use.

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 C05.011.105 was conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII. The ultrasonic procedures, personnel and equipment used 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.

The piping containing weld 1NI1-12 is an ASME III, Class 2 line with a design temperature of 650°F and a design pressure of 2500 psia. This weld is located inside the Unit 1 containment. This piping line containing this weld connects the discharge of the safety injection pumps 1A and 1B to the reactor coolant system cold leg 1B. As such, the primary function of this piping is to serve as part of the flow path that supplies ECCS cold leg injection from the NI pumps to the reactor coolant loop 1B during accident conditions. The pressure in this line is typically limited to the static head from the Refueling Water Storage Tank.

Weld 1NI1-12 is a circumferential butt weld on a 6" schedule 160 line just upstream of check valve 1NI180. The weld is between the 6" valve and the seamless piping. The piping material is SA376 TP304 and the valve body is SA182 F316.

These materials are austenitic (18Cr-8Ni for SA376 TP304, 16Cr-12Ni-2Mo for SA182 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 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. However 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 Stress Corrosion Cracking (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/1/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/1/A/6100/001). An ASME XI, IWC-5220 Class B leakage test Procedure (MP/0/A/7650/088A) is performed once per period. This weld would be recognized by active leakage or boron deposit buildups around the valve and piping.

In addition, leakage during operation at this weld location would be detected by various other 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.

These walkdowns and the leakage detection system 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-1NI-0001
2) Piping Isometric CN-1491-NI011
3) Flow Diagram CN-1562-1.1
4) Flow Diagram CN-1562-1.3
5) Valve Drawing for 1NI180, CNM-1205.00-0063
6) Technical Specification 3.4.13, RCS Operational Leakage
7) Technical Specification 3.4.15, RCS Leakage Detection Instrumentation

I. ASME Code Component Affected

Weld ID = 1NV-309-INLET
Item / Summary Number = C05.021.146
Chemical and Volume Control System (NV)
NV System Valve Body to Concentric 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

Weld joint geometry and material selection caused limitations resulting in the inability to achieve the required coverage. The valve and reducer material is stainless steel. This weld has a diameter of 2.375 inches and a wall thickness of .344 inches. 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; 70° 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 prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned and replaced 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 I)

VI. Alternate Examinations or Testing

Use of radiography (RT) to achieve more coverage has been evaluated and discarded because RT is less sensitive to service induced cracking and has not been subjected to the performance demonstration requirements in a manner similar to the ultrasonic method. While RT could in most cases provide more coverage the loss of sensitivity and lack of performance demonstration mitigates against its use.

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 C05.021.146 was conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII. The ultrasonic procedures, personnel and equipment used 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.

Weld 1NV-309-INLET is between a 2" diaphragm actuated control valve (1NV309) and a 3" x 2" concentric reducer. The weld is downstream of the Centrifugal Charging (NV) Pumps 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 1) as part of normal charging flowpath and 2) as part of the ECCS flow path boundary under accident conditions.

The subject weld is between a seamless pipe fitting component made from SA403 WP316 material and a valve body (SA351-CF8M). These materials (16Cr-12Ni-2Mo) are austenitic base materials that 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. However 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 Stress Corrosion Cracking (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 233 (Reciprocal Charging 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 floor below. The room is accessible during normal operation and is within the scope of daily operation walkdowns. Furthermore, this weld is part of the NC system mass balance performed daily. Periodic system engineer walkdowns are also performed that include leakage identification on the NV system.

In addition to walkdowns, an operational leak rate test (PT/1/A/4206/006) for the NV system is performed with the system pressurized on an eighteenth month frequency. An ASME XI, IWC-5220 Class B leakage test Procedure (MP/0/A/7650/088A) is performed once per 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 Reciprocal Charging 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) Flow Diagram CN-1554-1.2

2) Valve Drawing for 1NV309, CNM-1205.06-0048

I. ASME Code Component Affected

Weld ID = 1NV-309-OUTLET
Item / Summary Number = C05.021.147
Chemical and Volume Control System (NV)
NV System Valve Body to Concentric 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

Weld joint geometry and material selection caused limitations resulting in the inability to achieve the required coverage. The valve and reducer material is stainless steel. This weld has a diameter of 2.375 inches and a wall thickness of .344 inches. 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 70° 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 prevented scanning from that side. In order to scan all of the required volume for this weld, the valve would have to be redesigned and replaced 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 J)

VI. Alternate Examinations or Testing

Use of radiography (RT) to achieve more coverage has been evaluated and discarded because RT is less sensitive to service induced cracking and has not been subjected to the performance demonstration requirements in a manner similar to the ultrasonic method. While RT could in most cases provide more coverage the loss of sensitivity and lack of performance demonstration mitigates against its use.

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 C05.021.147 was conducted using personnel, qualified in accordance with ASME Section XI, Appendix VII. The ultrasonic procedures, personnel and equipment used 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.

Weld 1NV-309-OUTLET is between a 2" diaphragm actuated control valve (1NV309) and a 3" x 2" concentric reducer. The weld is downstream of the Centrifugal Charging (NV) Pumps 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 1) as part of normal charging flowpath and 2) as part of the ECCS flow path boundary under accident conditions.

The subject weld is between a seamless pipe fitting component made from SA403 WP316 material and a valve body (SA351-CF8M). These materials (16Cr-12Ni-2Mo) are austenitic base materials that 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. However 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 Stress Corrosion Cracking (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 233 (Reciprocal Charging 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 floor 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, an operational leak rate test (PT/1/A/4206/006) for the NV system is performed with the system pressurized on an eighteenth month frequency. An ASME XI, IWC-5220 Class B leakage test Procedure (MP/0/A/7650/088A) is performed once per 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 Reciprocal Charging 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) Flow Diagram CN-1554-1.2

2) Valve Drawing for 1NV309, CNM-1205.06-0048

IX. Other Information

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

James J. McArdle (Principal UT NDE Level III Examiner), T. L. Tucker (NDE Level III PT) 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-004

Attachment A

Weld 1NC28-11

Number of Pages = 4

UT Pipe Weld Examination

Site/Unit: Catawba / 1 | Procedure: PDI-UT-2 | Outage No.: CNS1-16

Summary No.: B09.011.020 | Procedure Rev.: C | Report No.: UT-06-662

Workscope: ISI | Work Order No.: 01121681 | Page: 1 of 4

Code: 1998 thru 2000 Addenda | Cat./Item: B-J- /B9.11.20 | Location:

Drawing No.: CN-1NC-28 | Description: Elbow to Valve 1NI134

System ID: NC

Component ID: B09.011.020 /1NC28-11 | Size/Length: N/A | Thickness/Diameter: .719 / 6.0

Limitations: Yes-See Attached Limitation Report | Start Time: 1228 | Finish Time: 1320

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

Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 06125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32808 | Surface Temp.: 64 °F

Cal. Report No.: CAL-06-646, CAL-06-647, CAL-06-648

Angle Used	0	45	45T	60	60L	
Scanning dB		41.5	41.5	58.3	60.0	

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

Comments:

Results: Accept ☑ Reject ☐ Info ☐ | Initial Section XI Exam

Percent Of Coverage Obtained > 90%: No 35.1% | Reviewed Previous Data: No

Examiner: Griebel, David M.	Level: II-N	Signature:	Date: 12/8/2006	Reviewer:		Signature:	Date: 12-11-06
Examiner: Jensen, Paule J.	Level: II-N	Signature:	Date: 12/8/2006	Site Review: N/A		Signature:	Date:
Other: N/A	Level: N/A	Signature:	Date:	ANII Review:		Signature:	Date: 12/11/06

REQUEST FOR RELIEF 07-CN-004 ATTACHMENT A

A/H 1/22/07

DUKE ENERGY COMPANY

ISI LIMITATION REPORT

Summary #: B09.011.020 **Component ID** 1NC28-11 **remarks:**

☒ NO SCAN SURFACE BEAM DIRECTION — Valve Configuration

☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☒ cw ☒ ccw

FROM L N/A to L N/A INCHES FROM W0 C/L-.5 to BEYOND

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

☐ NO SCAN SURFACE BEAM DIRECTION — Adjacent Weld

☒ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☐ cw ☐ ccw

FROM L 13.75 to L 17.75 INCHES FROM W0 C/L+1.4 to BEYOND

ANGLE: ☐ 0 ☐ 45 ☒ 60 other 60L FROM N/A DEG to N/A 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: Jay Eaton Level: III Date: 12/10/06 Sheet 2 of 4

Reviewed By: DE Hoover Date: 12.11.06 Authorized Inspector: Rodney Sam Date: 12/11/06

Item No: B09.011.020 **Weld No: 1NC28-11**

Weld Length = 21"

% weld length examined from S1 side = (21" – 4") / 21" x 100 = 81%

% of weld length limited due to adjacent weld = 100 – 81 = 19%

S1 = Elbow = 40.5% (81% of the length x 50% of required volume)
= 0.0% (19% of the length x 0% of required volume)
= 40.5%

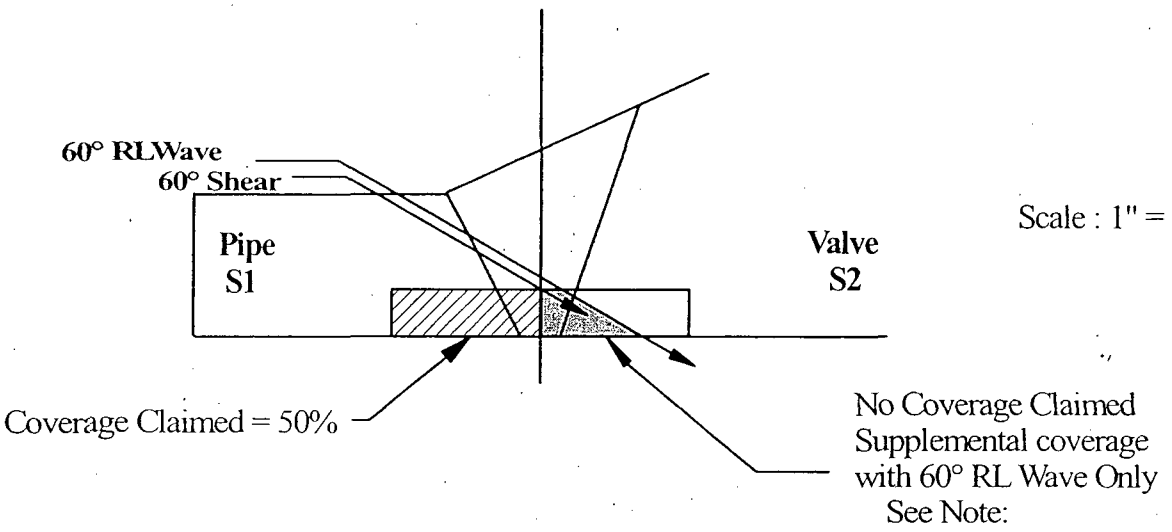
S2 = Valve = 0% (0% of the length x 0% of required volume)

S3 = CW = 50% (100% of the length x 50% of required volume)

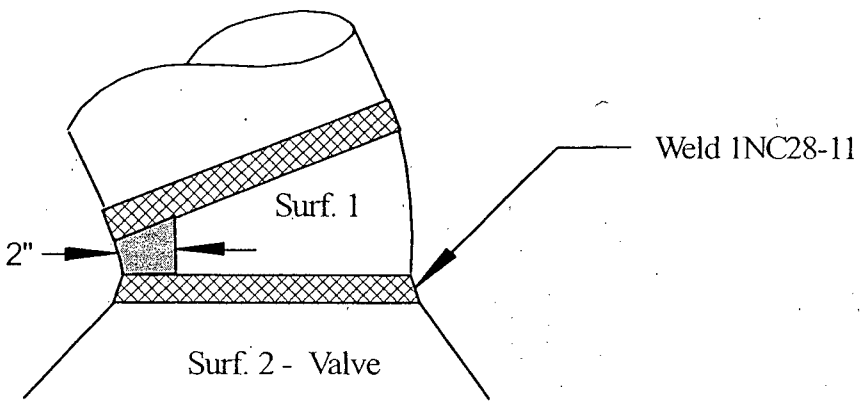
S4 = CCW = 50% (100% of the length x 50% of required volume)

Total = 140.5 / 4 = 35.1 % Aggregate Coverage

Inspector / Date: 12-8-06



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 22.2% coverage in one axial direction.



Plan View - Not to Scale

Limited scan from Surface 1 - 2" on each side of the intrados of the elbow for a total of 4".

Inspector / Date : 12-8-06 Page 4 of 4

Request for Relief 07-CN-004

Attachment B

Weld 1NC31-1

Number of Pages = 3

UT Pipe Weld Examination

Site/Unit: Catawba / 1 | Procedure: NDE-600 | Outage No.: CNS1-16

Summary No.: B09.011.030 | Procedure Rev.: 17 | Report No.: UT-06-667

Workscope: ISI | Work Order No.: 01121680 | Page: 1 of 3

Code: 1998 thru 2000 Addenda | Cat./Item: B-J- /B9.11.30 | Location:

Drawing No.: CN-1NC-31 | Description: Valve (1NI160) to Elbow

System ID: NC

Component ID: B09.011.030 /1NC31-1 | Size/Length: N/A | Thickness/Diameter: .719 / 6.0

Limitations: Yes - See Attached Limitation Report | Start Time: 1345 | Finish Time: 1406

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

Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 06125

Temp. Tool Mfg.: FISHER | Serial No.: MCNDE 27220 | Surface Temp.: 75 °F

Cal. Report No.: CAL-06-652, CAL-06-653, CAL-06-654

Angle Used	0	45	45T	60	60L	
Scanning dB			46	42.9	62.2	

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

Comments:

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: 12/12/2006	Reviewer		Signature: N E Hansen	Date: 12-13-06
Examiner: Day, John, C.	Level: II-N	Signature: John Day	Date: 12/12/2006	Site Review: N/A		Signature	Date
Other: N/A	Level: N/A	Signature	Date	ANII Review		Signature: Robert McGlew	Date: 12-14-06

REQUEST FOR RELIEF 07-GN-004 ATTACHMENT B

RJR 1/22/

DUKE ENERGY COMPANY
ISI LIMITATION REPORT

Summary #: B09.011.030 **Component ID** 1NC31-1

remarks: Due to Valve Configuration

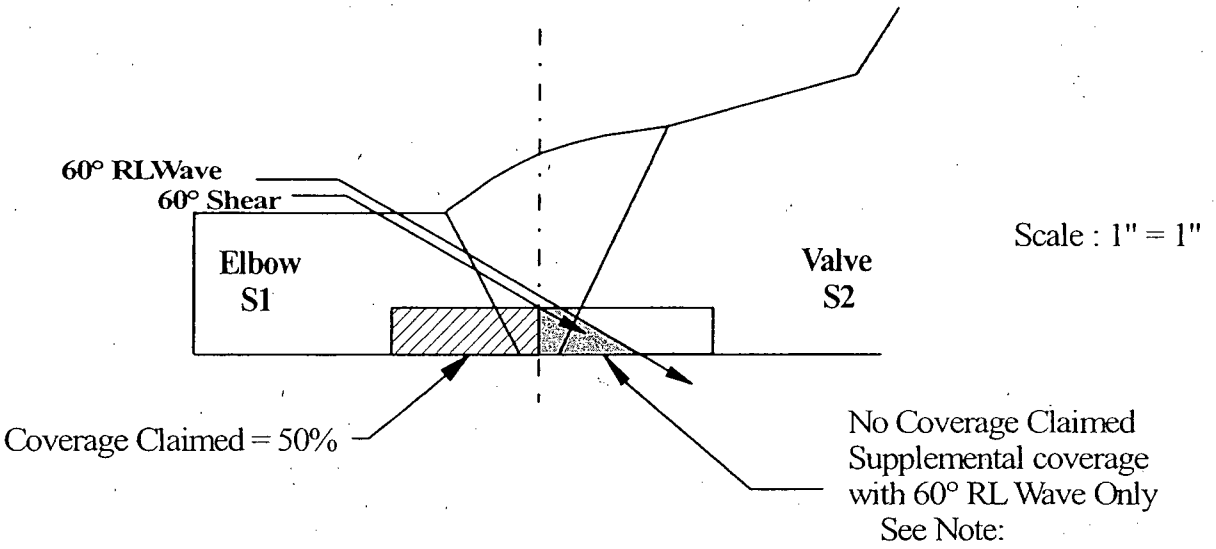
☒ NO SCAN	SURFACE	BEAM DIRECTION	
☐ LIMITED SCAN	☐ 1 ☒ 2	☒ 1 ☐ 2 ☒ cw ☒ ccw	
FROM L N/A to L N/A		INCHES FROM W0 CL -.6 to Beyond	
ANGLE: ☐ 0 ☒ 45 ☒ 60 other ____		FROM 0 DEG to 360 DEG	
☐ NO SCAN	SURFACE	BEAM DIRECTION	
☐ LIMITED SCAN	☐ 1 ☐ 2	☐ 1 ☐ 2 ☐ cw ☐ ccw	
FROM L ____ to L ____		INCHES FROM W0 ____ 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: 12-12-2006 Sheet 2 of 3

Reviewed By: *[signature]* Date: 12-13-06 Authorized Inspector: *Robert McLin* Date: 12-14-06

Item No. B09.011.030 Weld No. 1NC31-1



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 20% coverage in one axial direction.

% Coverage Calculations

S1 = Elbow	=	50%	(100% of the length x 50% of the volume)
S2 = Valve	=	0%	(0% of the length x 0% 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 : _____ III 12/12/06 Page 3 of 3

Request for Relief 07-CN-004

Attachment C

Weld 1NI18-2

Number of Pages = 3

UT Pipe Weld Examination

Site/Unit: Catawba / 1 | Procedure: PDI-UT-2 | Outage No.: CNS1-16

Summary No.: B09.011.155 | Procedure Rev.: C | Report No.: UT-06-625

Workscope: ISI | Work Order No.: 01121677 | Page: 1 of 3

Code: 1998 thru 2000 Addenda | Cat./Item: B-J- /B9.11.155 | Location:

Drawing No.: CN-1NI-18 | Description: Valve (1NI76A) to Pipe

System ID: NI

Component ID: B09.011.155 /1NI18-2 | Size/Length: N/A | Thickness/Diameter: 1.0 / 10.0

Limitations: Yes - See Attached Limitation Report | Start Time: 1350 | Finish Time: 1420

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

Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 06125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32808 | Surface Temp.: 77 °F

Cal. Report No.: CAL-06-607, CAL-06-608, CAL-06-609

Angle Used	0	45	45T	60	60L	
Scanning dB		31.0	31.0	40.0	66.3	

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

Comments:

Previously recorded indications were verified @ below recordable amplitude.

Results: Accept ☑ Reject ☐ Info ☐

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

Examiner Tucker, David K.	Level II-N	Signature	Date 12/1/2006	Reviewer		Signature	Date 12/7/06
Examiner Ransom, Greg	Level II-N	Signature	Date 12/1/2006	Site Review N/A		Signature	Date
Other N/A	Level N/A	Signature	Date	ANII Review		Signature	Date 12/8/06

REQUEST FOR RELIEF 07-CN-004 ATTACHMENT C

AJH 1/22/07

DUKE ENERGY COMPANY
ISI LIMITATION REPORT

Summary #: B09.011.155 **Component ID** 1NI18-2

remarks: 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 C/L-.55 to BEYOND
ANGLE: ☐ 0 ☐ 45 ☒ 60 other 60L — 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

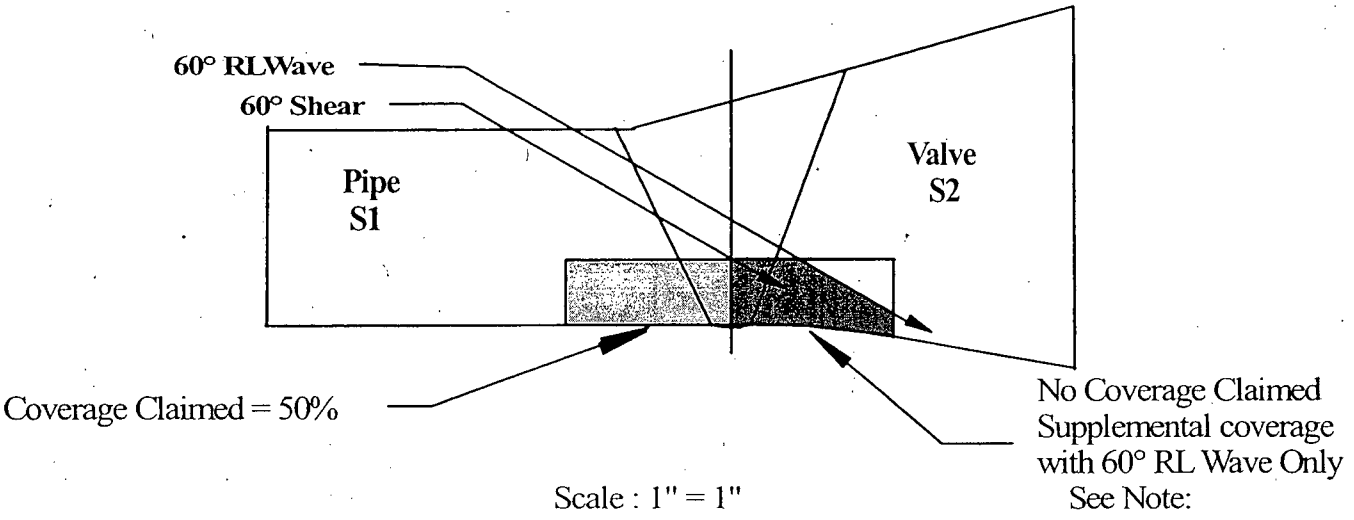
☐ NO SCAN — SURFACE — BEAM DIRECTION
☐ LIMITED SCAN — ☐ 1 ☐ 2 — ☐ 1 ☐ 2 ☐ cw ☐ ccw
FROM L ______ to L ______ — INCHES FROM W0 ______ to ______
ANGLE: ☐ 0 ☐ 45 ☐ 60 other ______ — FROM ______ DEG to ______ DEG

☐ 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: Jay Eaton [signature] Level: III Date: 12/3/06 Sheet 2 of 3

Reviewed By: [signature] Date: 12-7-06 Authorized Inspector: [signature] Date: 12/8/06



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 39.7% coverage in one axial direction.

Pipe Dia. = 10"

S1 = Pipee = 50% (100% of the length x 50% of the volume)

S2 = Valve = 0% (0% of the length x 0% 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: III 12/3/06

Request for Relief 07-CN-004

Attachment D

Weld 1NI148-10

Number of Pages = 3

UT Pipe Weld Examination

Site/Unit: Catawba / 1 | Procedure: NDE-600 | Outage No.: CNS1-16

Summary No.: B09.011.163 | Procedure Rev.: 17 | Report No.: UT-06-536

Workscope: ISI | Work Order No.: 01121676 | Page: 1 of 3

Code: 1998 thru 2000 Addenda | Cat./Item: B-J- /B9.11.163 | Location:

Drawing No.: CN-1NI-148 | Description: Tee to Valve ((1NI81)

System ID: NI

Component ID: B09.011.163 /1NI148-10 | Size/Length: N/A | Thickness/Diameter: 1.0 / 10.0

Limitations: Yes - See Attached Limitation Report | Start Time: 1050 | Finish Time: 1117

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

Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 06125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32823 | Surface Temp.: 64 °F

Cal. Report No.: CAL-06-557, CAL-06-558, CAL-06-559

Angle Used	0	45	45T	60	60L	
Scanning dB			53.8	51	52	

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

Comments:

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No - 37.5 | Reviewed Previous Data: Yes-100%

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Mauldin, Larry E.	II-N	Larry E Mauldin	11/22/2006		III	12/3/06
Examiner	Level	Signature	Date	Site Review	Signature	Date
Stauffer, Lester, E.	III-N		11/22/2006	N/A		
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A				Rodney Sam	12/4/06

REQUEST FOR RELIEF 07-CN-004 ATTACHMENT D

AJH 1/22/03

DUKE ENERGY COMPANY

ISI LIMITATION REPORT

Summary #: B09.011.163 **Component ID** 1NI148-10 **remarks:**

☒ NO SCAN SURFACE BEAM DIRECTION — Weld Taper

☐ LIMITED SCAN ☒ 1 ☒ 2 ☒ 1 ☒ 2 ☐ cw ☐ ccw

JK 11/26/06 JK 11/26/06

FROM L N/A to L N/A INCHES FROM W0 C/L to 0.7"

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

☒ NO SCAN SURFACE BEAM DIRECTION — Valve Configuration

☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☒ cw ☒ ccw

FROM L N/A to L N/A INCHES FROM W0 C/L 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 ____

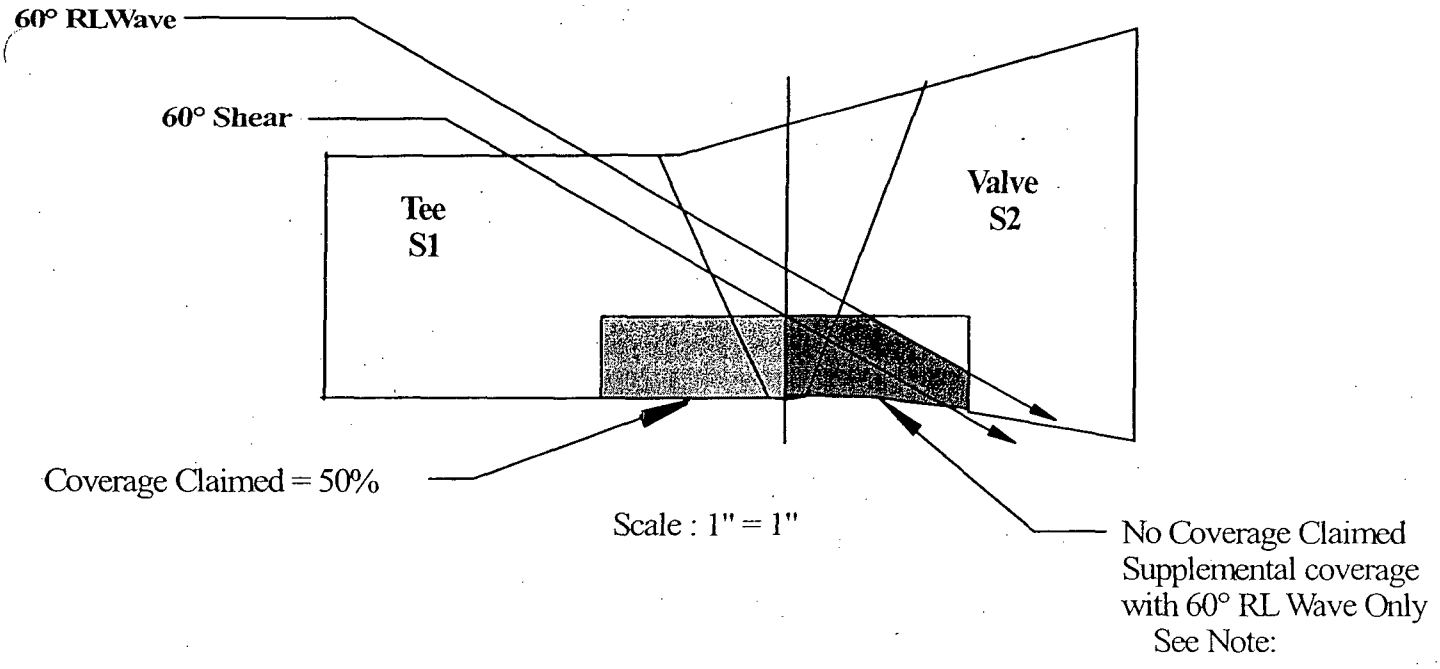
ANGLE: ☐ 0 ☐ 45 ☐ 60 other ____ FROM ____ DEG to ____ DEG

Sketch(s) attached ☒ yes ☐ No

Prepared By: Larry Mauldin Level: II Date: 11/22/2006 Sheet 2 of 3

Reviewed By: III Date: 11/26/06

Authorized Inspector: Date: 12/4/06



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 41.5% coverage in one axial direction.

Pipe Dia. = 10"

S1 = Tee	=	50%	(100% of the length x 50% of the volume)
S2 = Valve	=	0%	(0% of the length x 0% 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: Larry Maulden 11-22-06

III 11/26/06

Request for Relief 07-CN-004

Attachment E

Weld 1NI148-11

Number of Pages = 3

UT Pipe Weld Examination

Site/Unit: Catawba / 1 | Procedure: NDE-600 | Outage No.: CNS1-16

Summary No.: B09.011.164 | Procedure Rev.: 17 | Report No.: UT-06-537

Workscope: ISI | Work Order No.: 01121676 | Page: 1 of 3

Code: 1998 thru 2000 Addenda | Cat./Item: B-J- /B9.11.164 | Location:

Drawing No.: CN-1NI-148 | Description: Tee to Valve (1NI82)

System ID: NI

Component ID: B09.011.164 /1NI148-11 | Size/Length: N/A | Thickness/Diameter: 1.0 / 10.0

Limitations: Yes - See Attached Limitation Report | Start Time: 1056 | Finish Time: 1113

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

Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 06125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32823 | Surface Temp.: 64 °F

Cal. Report No.: CAL-06-557, CAL-06-558, CAL-06-559

Angle Used	0	45	45T	60	60L	
Scanning dB			53.8	51	52	

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

Comments:

Results: Accept ☑ Reject ☐ Info ☐

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

Examiner	Level II-N	Signature	Date	Reviewer		Signature	Date
Mauldin, Larry E.		Larry E. Mauldin	11/22/2006			III	11/26/06
Examiner	Level III-N	Signature	Date	Site Review		Signature	Date
Stauffer, Lester, E.		LS	11/22/2006	N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A						Rodney Sam	12/4/06

REQUEST FOR RELIEF 07-CN-004 ATTACHMENT E

AJH 1/22/07

DUKE ENERGY COMPANY

ISI LIMITATION REPORT

Summary #: B09.011.164 **Component ID** 1NI148-11 **remarks:**

☒ NO SCAN SURFACE BEAM DIRECTION — Weld Taper

☐ LIMITED SCAN ☒ 1 ☒ 2 ☒ 1 ☒ 2 ☐ cw ☐ ccw

FROM L N/A to L N/A INCHES FROM W0 C/L to 0.7"

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

☒ NO SCAN SURFACE BEAM DIRECTION — Valve Configuration

☐ LIMITED SCAN ☒ 1 ☐ 2 ☐ 1 ☒ 2 ☒ cw ☒ ccw

FROM L N/A to L N/A INCHES FROM W0 C/L 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

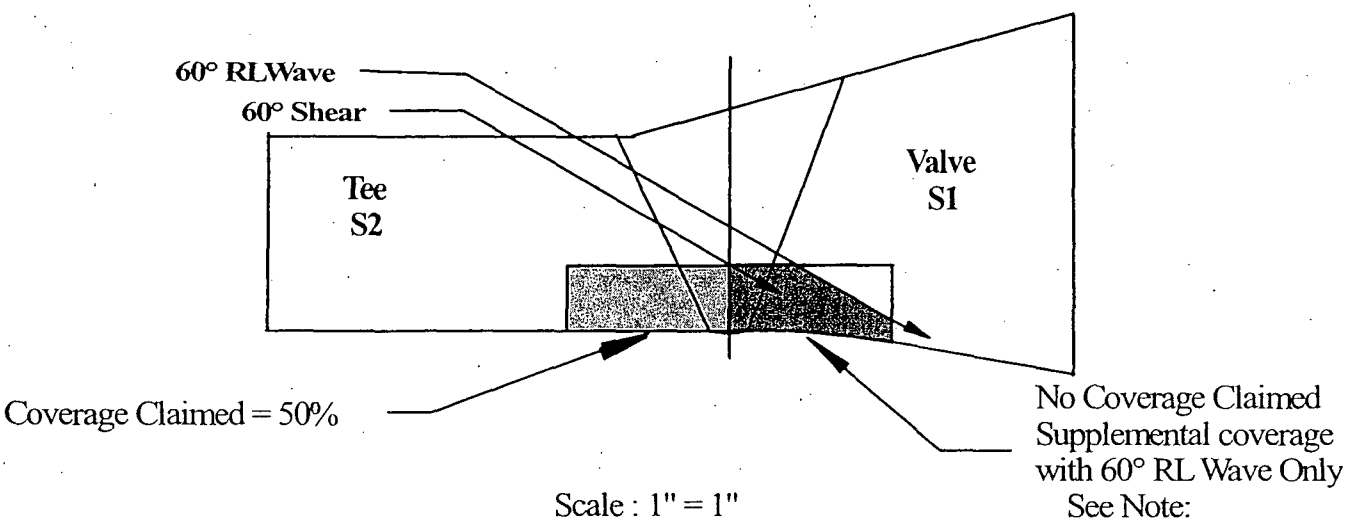
FROM L ____ to L ____ INCHES FROM W0 ____ to ____

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

Sketch(s) attached ☒ yes ☐ No

Prepared By: Larry Mauldin Level: II Date: 11/22/2006 Sheet 2 of 3

Reviewed By: III Date: 11/26/06 Authorized Inspector: Date: 12/9/06



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 39.7% coverage in one axial direction.

Pipe Dia. = 10"

S1 = Valve	=	0%	(0% of the length x 0% of the volume)
S2 = Tee	=	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: Larry Maulden 11.22.06 III 11/26/06

Request for Relief 07-CN-004

Attachment F

Weld 1SWRF-1-OUTLET

Number of Pages = 4

Liquid Penetrant Examination

Site/Unit: Catawba / 1 | Procedure: NDE-35 | Outage No.: CNS1-16

Summary No.: C02.011.003 | Procedure Rev.: 21 | Report No.: PT-06-375

Workscope: ISI | Work Order No.: 01121673 | Page: 1 of 4

Code: 1998 thru 2000 Addenda | Cat./Item: C-B- /C2.11.3 | Location:

Drawing No.: CN-ISIN3-1554-1.6 | Description: Nozzle to Shell

System ID: NV

Component ID: C02.011.003 /1SWRF-1-OUTLET | Size/Length: .154 / 2.0

Limitations: Yes - See Calculation Report

Light Meter Mfg.: Lutron | Serial No.: MCNDE32804 | Illumination: >1200 LX

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32823 | Surface Temp.: 73 °F

Comparator Block Temp.: Side A: N/A °F | Side B: N/A °F | Resolution: Not Used

Lo/Wo Location: N/A | Surface Condition: AS WELDED

	Cleaner	Penetrant	Remover	Developer
Brand	MAGNAFLUX	MAGNAFLUX	MAGNAFLUX	MAGNAFLUX
Type	SKC-S	SKL-SP	SKC-S	SKD-S2
Batch No.	05B01K	97A10K	05B01K	04C10K
Time	Evap. 5 Min.	Dwell 10 Min.	Evap. 5 Min.	Develop 10 Min.

Time Exam Started: N/A | Time Exam Completed: N/A

Indication No.	Loc L	Loc W	Diameter	Length	Type R/L	Remarks
NRI						

Comments:

Penetrant Category A - Acceptance Standard "L"

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No - 74.7 | Reviewed Previous Data: Yes

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Resor, James H.	II	James H Resor	11/29/2006	Gary Moss		6-26-07
Examiner	Level	Signature	Date	Site Review	Signature	Date
N/A	N/A			N/A		
Other	Level	Signature	Date	ANI Review	Signature	Date
N/A	N/A			Robert McGill		6-26-07

REQUEST FOR RELIEF 07-ISI-N2 ATTACHMENT E

AIH 1/29/07
AIH 6/26/07

Determination of Percent Coverage for Surface Examinations

Site/Unit:	Catawba / 1	Procedure:	NDE-35	Outage No.:	CNS1-16
Summary No.:	C02.011.003	Procedure Rev.:	21	Report No.:	PT-06-375
Workscope:	ISI	Work Order No.:	01121673	Page:	2 of 4

Area Required (as shown in applicable code reference drawing)

Length 9.032 * Width 1.750

= Total Area required 15.806 square inches

Coverage Achieved

Area examined 11.806 sq. in. / Total area required (100%) 15.806 sq. in.

= Percent coverage 74.693 % (area required - area of limitations = area examined)

To determine length of a circumferential weld

Note - Diameter refers to actual external diameter not pipe size (see table below)

Diameter 2.875 * (Pi) 3.1416

= Length 9.032 inches

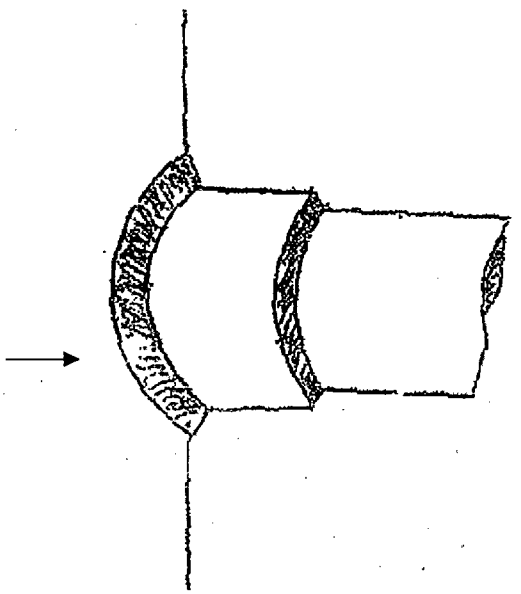
Pipe Size	Actual Diameter	(Length) Circumference		Pipe Size	Actual Diameter	(Length) Circumference
2	2.375	7.46		12	12.75	40.06
2.5	2.875	9.03		14	14.0	43.98
3	3.5	11.0		16	16.0	50.27
3.5	4.0	12.57		18	18.0	56.55
4	4.5	14.14		20	20.0	62.83
5	5.563	17.48		22	22.0	69.12
6	6.625	20.81		24	24.0	75.40
8	8.625	27.10		30	30.0	94.25
10	10.75	33.77				

Site Field Supervisor: Joshua Smith L-III Date: 6/26/07

Summary No. : C02.011.003 **W/O#:** 01121673

Vessel

C02.011.003
Seal Water Return
Outlet Nozzle
(no scale)



Exam Area Width = 1.750"

Exam Area Length = 9.032" (2.875" x π)

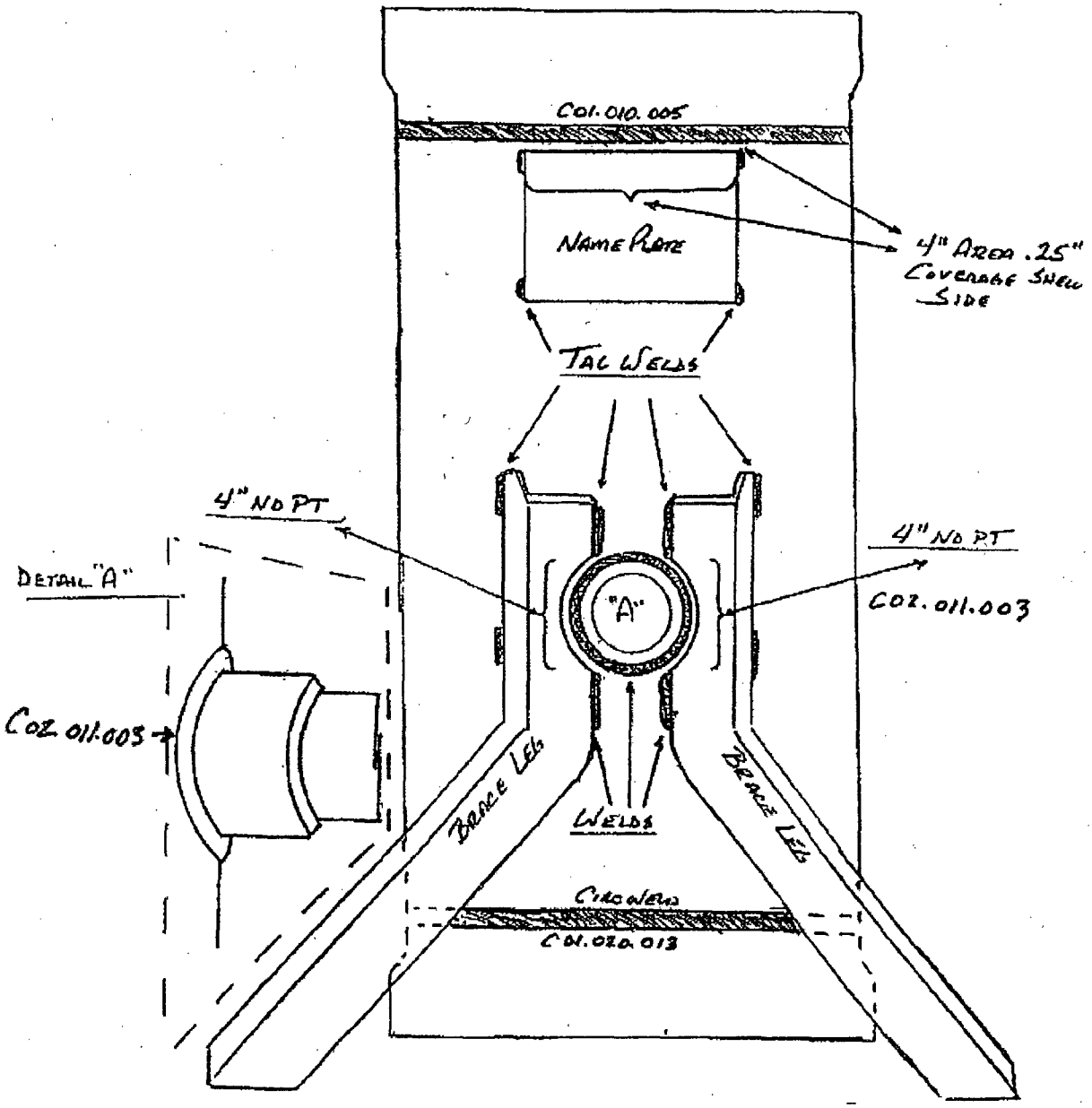
Total Required Exam Area = 15.806^{2}" (9.032" x 1.75")
Area of No Exam Coverage = 4^{2}" (0.50" x 8.00")
Area of No Exam Coverage = 25.30% (4 ÷ 15.806)

Total Exam Coverage = 74.7% (100 - 25.30)

Examiner: James A Bosen

Seal Water Filter PT Exam 11-29-2006 W/O # 01121673

Summary No. C02.011.003 Limited 0.50" x 4.00" on two sides due to Vessel legs as shown on drawing below (drawing not to scale)



Examiner: _____

Request for Relief 07-CN-004

Attachment G

Weld 1ND3-1

Number of Pages = 3

UT Pipe Weld Examination

Site/Unit: Catawba / 1 | Procedure: PDI-UT-2 | Outage No.: CNS1-16

Summary No.: C05.011.065 | Procedure Rev.: C | Report No.: UT-06-272

Workscope: ISI | Work Order No.: 01132910 | Page: 1 of 3

Code: 1998 thru 2000 Addenda | Cat./Item: C-F-1/C5.11.65 | Location:

Drawing No.: CN-1ND-3 | Description: Valve (1NI185A) to Pipe

System ID: ND

Component ID: C05.011.065 /1ND3-1 | Size/Length: N/A | Thickness/Diameter: .562 / 18.0

Limitations: Yes - See Attached Limitation Report | Start Time: 1142 | Finish Time: 1220

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

Lo Location: 9.1.1.3 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 05125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32819 | Surface Temp.: 104 °F

Cal. Report No.: CAL-06-322, CAL-06-323, CAL-06-324

Angle Used	0	45	45T	60	70	
Scanning dB			36.0	68.0	64.0	

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

Comments:

No scan on upstream side due to valve to pipe configuration.

Results: Accept ☑ Reject ☐ Info ☐

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

Examiner	Level II-N	Signature	Date	Reviewer		Signature	Date
Tucker, David K.			8/22/2006	D E Jorgen			8-22-06
Examiner	Level II-N	Signature	Date	Site Review		Signature	Date
Brown, Thomas			8/22/2006	N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A						Rodney Sam	12/6/06

REQUEST FOR RELIEF 07-CN-004 ATTACHMENT G

AJH 1/22/07

DUKE ENERGY COMPANY
ISI LIMITATION REPORT

Summary #: C05.011.065 **Component ID** 1ND3-1

remarks: 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 - CL-.45" to Beyond
ANGLE: ☐ 0 ☒ 45 ☒ 60 other 70 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

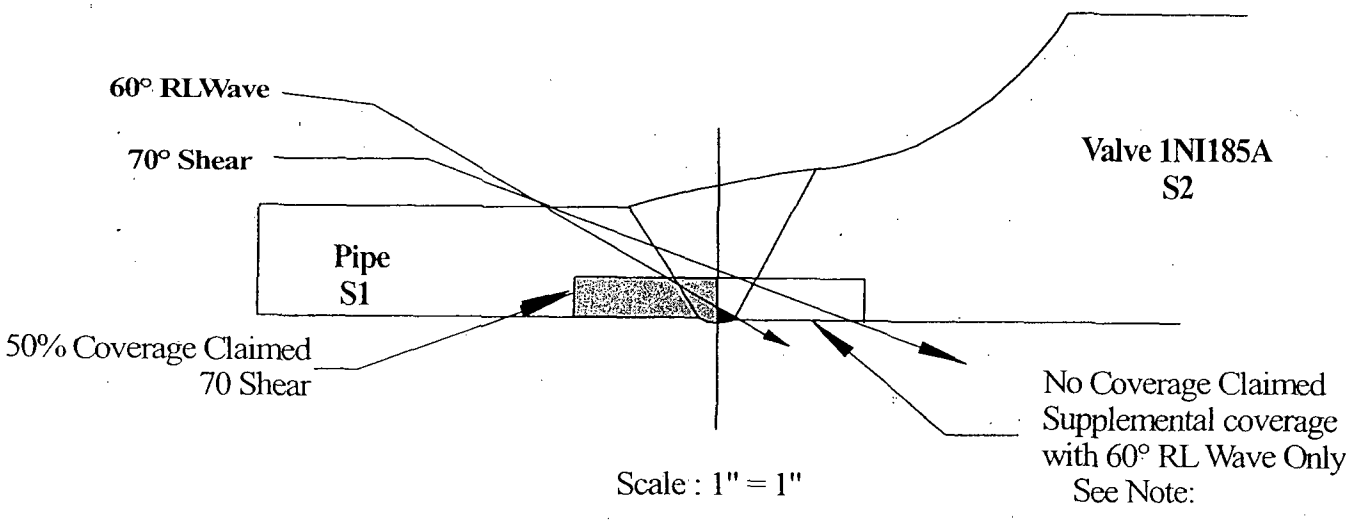
Sketch(s) attached ☒ yes ☐ No

Prepared By: Jay Eaton [signature] Level: III Date: 11-16-2006 Sheet 2 of 3

Reviewed By: [signature] Date: 8-22-06 Authorized Inspector: [signature] Date: 12/6/06

Item No. C05.011.065

Weld No. 1ND3-1



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 3.5% coverage in one axial direction.

Pipe Dia. = 18"
t = 0.562"
1/3 t = 0.19"
Weld Length = 56.6"
Weld + ¼" ea. Side = 1.5"

S1 = Pipe = 50% (100% of the length x 50% of the volume)

S2 = Valve = 0% (0% of the length x 0% 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: 11/16/06

Request for Relief 07-CN-004

Attachment H

Weld 1NI1-12

Number of Pages = 5

UT Pipe Weld Examination

Site/Unit: Catawba / 1 | Procedure: PDI-UT-2 | Outage No.: CNS1-16

Summary No.: C05.011.105 | Procedure Rev.: C | Report No.: UT-06-568

Workscope: ISI | Work Order No.: 01121663 | Page: 1 of 5

Code: 1998 thru 2000 Addenda | Cat./Item: C-F-1/C5.11.105 | Location:

Drawing No.: CN-1NI-1 | Description: Pipe to Valve (1NI180)

System ID: NI

Component ID: C05.011.105 /1NI1-12 | Size/Length: N/A | Thickness/Diameter: .719 / 6.0

Limitations: Yes - See Attached Limitation Report | Start Time: 1145 | Finish Time: 1200

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

Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 06125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32823 | Surface Temp.: 72 °F

Cal. Report No.: CAL-06-591, CAL-06-592, CAL-06-593

Angle Used	0	45	45T	60	60L	
Scanning dB			38	40	71	

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

Comments:

Results: Accept ☑ Reject ☐ Info ☐

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

Examiner	Level	Signature	Date	Reviewer	Signature	Date
Brown, Thomas	II-N	Tony D Brown	11/27/2006	D E Jansen		12-6-06
Examiner	Level	Signature	Date	Site Review	Signature	Date
Waddel, Joey	II-N	Joey Waddel	11/27/2006	N/A		
Other	Level	Signature	Date	ANII Review	Signature	Date
N/A	N/A				Rodney Sam	12/7/06

REQUEST FOR RELIEF 07-CN-004 ATTACHMENT H

AJH 1/24/07

Ultrasonic Indication Report

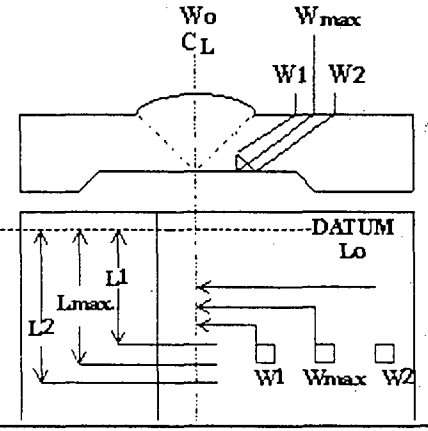
Site/Unit:	Catawba / 1	Procedure:	PDI-UT-2	Outage No.:	CNS1-16
Summary No.:	C05.011.105	Procedure Rev.:	C	Report No.:	UT-06-568
Workscope:	ISI	Work Order No.:	01121663	Page:	2 of 5

Search Unit Angle: 60 °

Wo Location: CL of Weld

Lo Location: 9.1.1.1

- (•) Piping Welds
- ( ) Ferritic Vessels ≥ 2"T
- ( ) Other _____



MP	Metal Path	Wmax	Distance From Wo To S.U. At Maximum Response
RBR	Remaining Back Reflection	W1	Distance From Wo At Of Max (Forward)
L	Distance From Datum	W2	Distance From Wo At Of Max (Forward)

Comments: **Also seen with 60°RL. This indication has been previously recorded. No change.**

Scan #	Indication No.	% Of DAC	W Max W	W Max MP	Forward Of Max W1	Forward Of Max MP	Backward Of Max W2	Backward Of Max MP	L1 Of Max	L Max	L2 Of Max	RBR Amp.	Remarks
2	1	75%	1.2	1.48	N/A	N/A	N/A	N/A	N/A	2.25	N/A	N/A	Root Geometry

Examiner	Level II-N	Signature	Date	Reviewer	Signature / Date
Brown, Thomas			11/27/2006		12.6.06
Examiner	Level II-N	Signature	Date	Site Review	Signature / Date
Waddel, Joey			11/27/2006	N/A	
Other	Level N/A	Signature	Date	ANII Review	Signature / Date
N/A					12/7/06

Duke Energy

Supplemental Report

Report No.: UT-06-568

Summary No.: C05.011.105

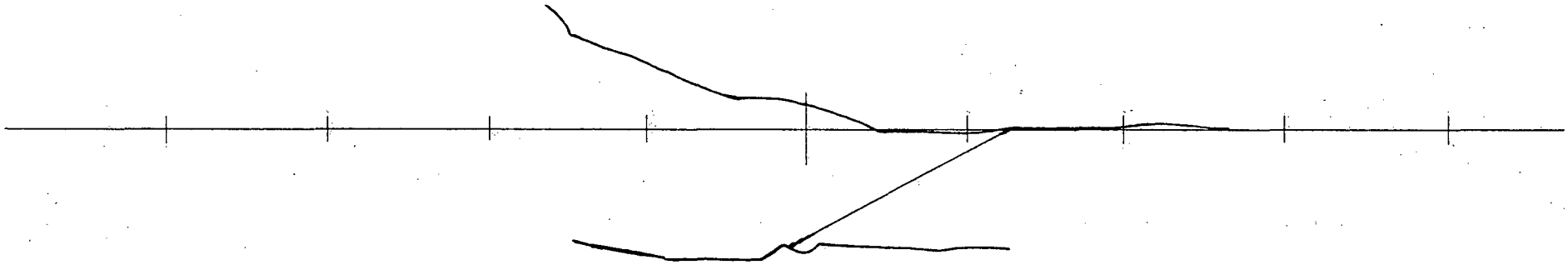
Examiner: Brown, Thomas — Level: II-N — Reviewer: — Date: 12.6.06

Examiner: Waddel, Joey — Level: II-N — Site Review: N/A — Date:

Other: N/A — Level: N/A — ANII Review: — Date: 12/7/06

Comments: **Indication #1 - 60° was determined to be root geometry. Indication was also seen with 60°L. Previously recorded. No change.**

Sketch or Photo: Z:\UT\IDDEAL\ProfileLine2.jpg



DUKE ENERGY COMPANY
ISI LIMITATION REPORT

Summary #: C05.011.105 **Component ID** 1NI1-12

remarks: Valve Congifuration

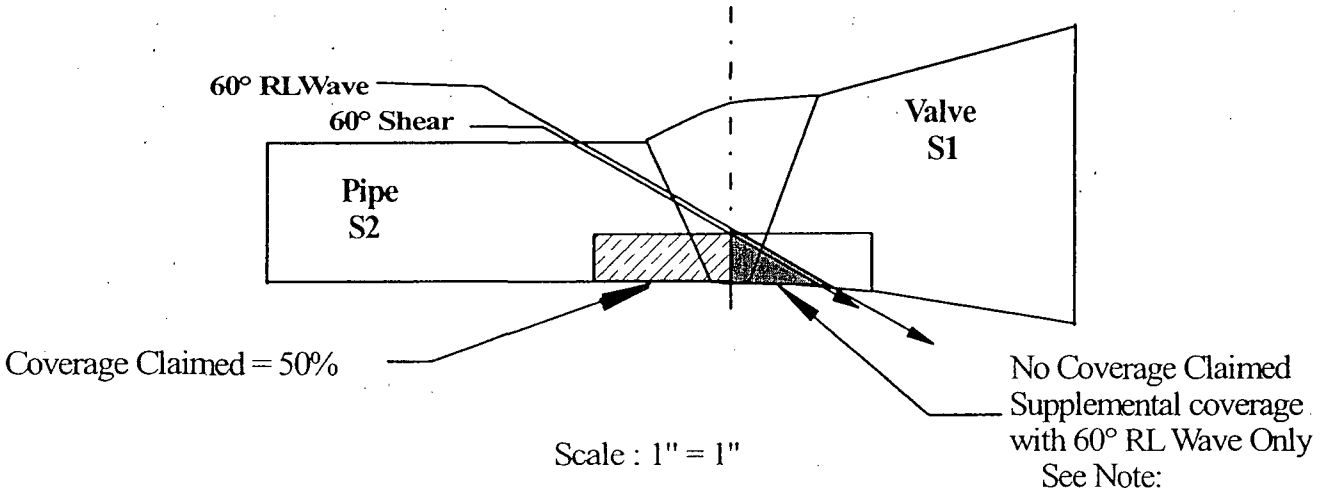
☒ NO SCAN	SURFACE	BEAM DIRECTION	
☐ LIMITED SCAN	☒ 1 ☒ 2	☒ 1 ☐ 2 ☒ cw ☒ ccw	
FROM L N/A to L N/A		INCHES FROM W0 CL -.4 to Beyond	
ANGLE: ☐ 0 ☒ 45 ☒ 60 other ____		FROM 0 DEG to 360 DEG	
☐ NO SCAN	SURFACE	BEAM DIRECTION	
☐ LIMITED SCAN	☐ 1 ☐ 2	☐ 1 ☐ 2 ☐ cw ☐ ccw	
FROM L ____ to L ____		INCHES FROM W0 ____ 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: Thomas Brown [signature] Level: II Date: 11/27/2006 Sheet 4 of 5

Reviewed By: [signature] Date: 12-6-06 Authorized Inspector: [signature] Date: 12/7/06

Item No. C05.011.105 Weld No. 1NI1-12



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 18.9% coverage in one axial direction.

Pipe Dia. = 6"

S1 = Pipe	=	50%	(100% of the length x 50% of the volume)
S2 = Valve	=	0%	(0% of the length x 0% 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: III 12/3/06

Request for Relief 07-CN-004

Attachment I

Weld 1NV-309-INLET

Number of Pages = 3

UT Pipe Weld Examination

Duke Energy

Site/Unit:	Catawba / 1	Procedure:	NDE-600	Outage No.:	CNS1-16
Summary No.:	C05.021.146	Procedure Rev.:	17	Report No.:	UT-06-553
Workscope:	ISI	Work Order No.:	01121907	Page:	1 of 3

Code: 1998 thru 2000 Addenda Cat./Item: C-F-1/C5.21.146 Location:

Drawing No.: CN-1NV-36 Description: Valve Body to Concentric Reducer

System ID: NV

Component ID: C05.021.146 /1NV-309-INLET Size/Length: N/A Thickness/Diameter: .344 / 2.0

Limitations: Yes - See Attached Limitation Report Start Time: 1342 Finish Time: 1402

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

Lo Location: 9.1.1.1 Wo Location: Centerline of Weld Couplant: ULTRAGEL II Batch No.: 06125

Temp. Tool Mfg.: D.A.S Serial No.: MCNDE32796 Surface Temp.: 75 °F

Cal. Report No.: CAL-06-579, CAL-06-580, CAL-06-581

Angle Used	0	45	45T	60	38	70
Scanning dB				44	34.7	46

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

Comments:

Results: Accept ☑ Reject ☐ Info ☐ Pipe Weld Examiner

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

Examiner	Level II-N	Signature	Date	Reviewer		Signature	Date
Mauldin, Larry E.		Larry E Mauldin	11/26/2006		III		12/3/06
Examiner	Level IIL	Signature	Date	Site Review		Signature	Date
Ross, Jake E.		Jake Ross	11/26/2006	N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A						Rodney Sam	12/5/06

REQUEST FOR RELIEF 07-CN-004 ATTACHMENT I

AJH 1/24/07

DUKE ENERGY COMPANY
ISI LIMITATION REPORT

Summary #: C05.021.146 **Component ID** 1NV-309-INLET

remarks:
Due to Valve Configuration

[X] NO SCAN SURFACE BEAM DIRECTION
[ ] LIMITED SCAN [X] 1 [ ] 2 [ ] 1 [X] 2 [X] cw [X] ccw
FROM L N/A to L N/A INCHES FROM W0 .3" to Beyond
ANGLE: [ ] 0 [X] ~~45~~ 38° [X] 60 other 70 FROM 0 DEG to 360 DEG
12/3/06

[ ] 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

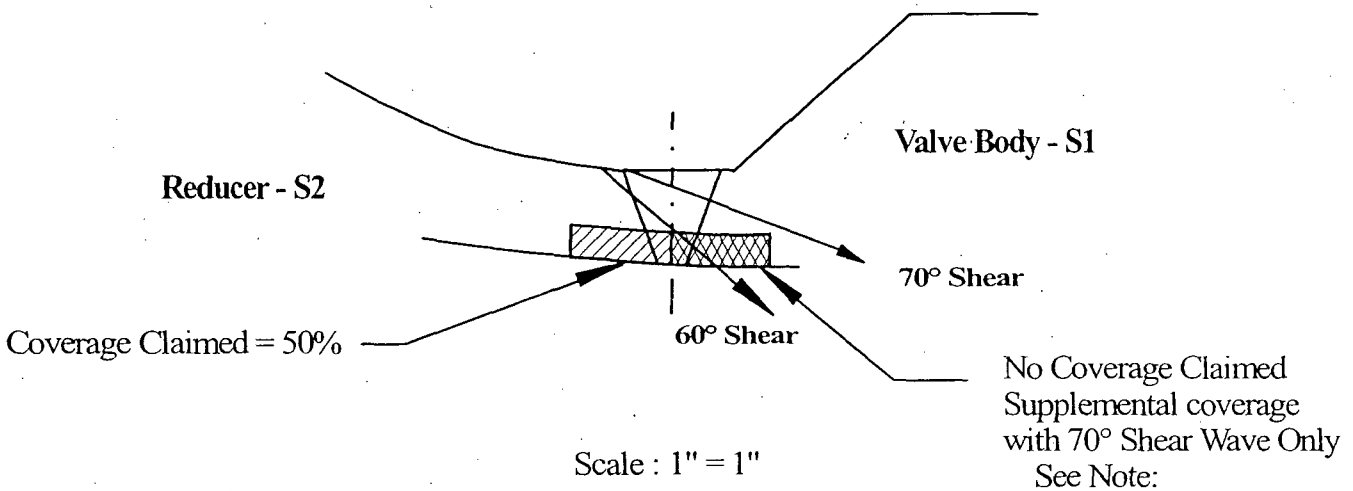
[ ] NO SCAN SURFACE BEAM DIRECTION
[ ] LIMITED SCAN [ ] 1 [ ] 2 [ ] 1 [ ] 2 [ ] cw [ ] ccw
FROM L ______ to L ______ INCHES FROM W0 ______ to ______
ANGLE: [ ] 0 [ ] 45 [ ] 60 other ______ FROM ______ DEG to ______ DEG

[ ] 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 [X] yes [ ] No

Prepared By: Larry Mauldin *Larry Mauldin* Level: II Date: 11-26-2006 Sheet 2 of 3

Reviewed By: *[signature]* III Date: 12/3/06 Authorized Inspector: *Rodney Sam* Date: 12/5/06



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.

Pipe Dia. = 2"

S1 = Valve =	0%	(0% of the length x 0% of the volume)
S2 = Reducer =	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: Larry Maulden 11-26-06

III 12/03/06

Request for Relief 07-CN-004

Attachment J

Weld 1NV-309-OUTLET

Number of Pages = 3

UT Pipe Weld Examination

Site/Unit: Catawba / 1 | Procedure: NDE-600 | Outage No.: CNS1-16

Summary No.: C05.021.147 | Procedure Rev.: 17 | Report No.: UT-06-554

Workscope: ISI | Work Order No.: 01121907 | Page: 1 of 3

Code: 1998 thru 2000 Addenda | Cat./Item: C-F-1/C5.21.147 | Location:

Drawing No.: CN-1NV-36 | Description: Valve Body to Concentric Reducer

System ID: NV

Component ID: C05.021.147 /1NV-309-OUTLET | Size/Length: N/A | Thickness/Diameter: .344 / 2.0

Limitations: Yes - See Attached Limitation Report | Start Time: 1347 | Finish Time: 1404

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

Lo Location: 9.1.1.1 | Wo Location: Centerline of Weld | Couplant: ULTRAGEL II | Batch No.: 06125

Temp. Tool Mfg.: D.A.S | Serial No.: MCNDE32796 | Surface Temp.: 75 °F

Cal. Report No.: CAL-06-579, CAL-06-580, CAL-06-581

Angle Used	0	45	45T	60	38	70
Scanning dB				44	34.7	46

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

Comments:

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: Yes-37.5 % | Reviewed Previous Data: Yes

Examiner	Level II-N	Signature	Date	Reviewer		Signature	Date
Mauldin, Larry E.		Larry E Mauldin	11/26/2006			III	12/3/06
Examiner	Level IIL	Signature	Date	Site Review		Signature	Date
Ross, Jake E.		Jake Ross Jr.	11/26/2006	N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A						Rodney Sam	12/5/06

REQUEST FOR RELIEF 07-GN-004 ATTACHMENT J

AJH 1/24/07

DUKE ENERGY COMPANY

ISI LIMITATION REPORT

Summary #: C05.021.147 **Component ID** 1NV-309-OULET

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 .3" to Beyond

ANGLE: ☐ 0 ☒ ~~45~~ 38° ☒ 60 other 70 FROM 0 DEG to 360 DEG

12/3/06

☐ 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

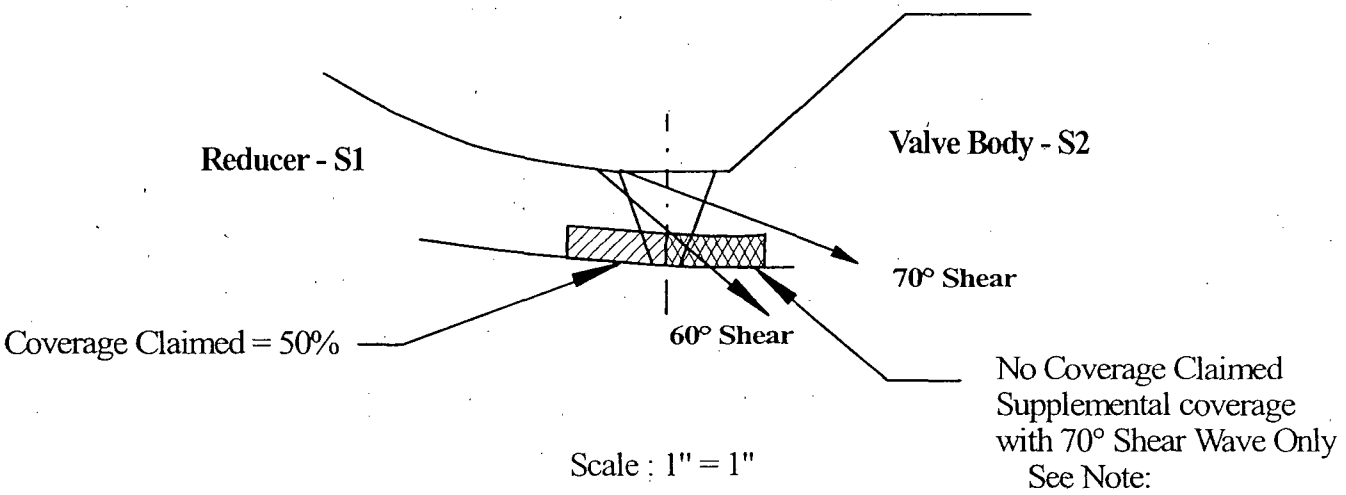
Sketch(s) attached ☒ yes ☐ No

Prepared By: Larry Mauldin *Larry Mauldin* Level: II Date: 11-26-2006 Sheet 2 of 3

Reviewed By: *[signature]* III Date: 12/3/06 Authorized Inspector: *[signature]* Date: 12/5/06

Item No: C05.021.147

Weld No. 1NV-309-OUTLET



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Total = 150 / 4 = 37.5 % Aggregate Coverage

Inspector / Date: Larry Maulden 11-26-06

III 12/3/06